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Edited by

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Contents

Research on Innovation of Financial Management Model Based on Cloud Computing

Abstract

Against the background of the rapid development of big data and big data analysis technologies, cloud computing service providers provide services to enterprises and individuals. In many large enterprises, by setting up a cloud computing platform environment, multiple services within the enterprise are placed on the cloud platform to provide resource sharing services for various departments. With the dramatic improvement in computing performance of computer clusters, big data and cloud computing technologies are maturing. We combine cloud computing with financial management services, and use modern technical means to innovate financial management models; we will change the financial management model of enterprises by building financial sharing service centers, thereby providing more efficient financial management services. Based on the research of cloud computing technology, this paper expounds the application of cloud computing in financial sharing, and explores the transformation of financial management models in the context of cloud computing. Fully clarify the principles and procedures for the construction of financial sharing service centers based on cloud computing, and discuss the basic structure of financial cloud management. Finally, we discuss the operation model of financial management based on cloud computing to provide a reference for researchers in financial management.

1 Introduction

In the context of economic globalization, innovation is an important driving force for economic development, and taking the lead in innovation can be in an advantageous position in development. The development trend of world economic integration is becoming increasingly apparent, and the scale of enterprises is constantly growing, and many large enterprise groups have emerged. The transnational and cross-regional operations of enterprises have developed rapidly, and market competition has become increasingly fierce. With the increasing number of branches around the world, the internal management and control of enterprises have become more complicated. Financial management is the core and lifeblood of business operations. In order to adapt to new changes, the financial management model needs to be changed. The new financial management model needs to be able to strengthen the control of various subsidiaries and reduce costs through the standardization and standardization of business processes. The development of computer information technology and advances in cloud computing and big data-related technologies have made financial shared service centers widely used.

In the process of enterprise development, innovative financial management models are needed.

Comprehensive domestic and foreign financial management experience, centralized management of financial

Ajitav Acharya

core business, divest non-core business, rectify and merge these businesses, and achieve resource sharing. The rapid development of computer information technology, the continuous improvement of the Internet platform, and the ability of cloud computing to process data at high speed have created basic conditions for financial sharing. In the new era, the construction of financial shared service centers has become one of the main ways for enterprises to respond to new challenges.

Multinational companies use Internet information technology to build financial shared service centers to solve problems such as corporate management and work efficiency. Financial sharing uses a new perspective to transform the original financial process using computer technology. Under the new service model, it sorts out and combines simple and repetitive financial tasks to unify management standards and realize financial information sharing.

Big data, cloud computing overview and financial cloud

1.1 Big data and cloud computing overview

Big data has obvious characteristics and is also called massive data. With the advancement of Internet technology, the Internet is widely used in various industries, and a large amount of data is generated every day. This data is continuously accumulated to form a big data environment. Cloud computing and big data are inseparable. Big data provides a data foundation for cloud computing, and cloud computing provides a good technical environment for big data. Big data and cloud computing related technologies are developed in concert to perform data analysis and provide data references for economic management. Cloud computing is a computing model that provides services through the Internet. Cloud computing is based on the Internet and virtual technologies. It provides users with virtualized resources and data. Depending on the resources provided by the cloud, it can be divided into IaaS, SaaS, PaaS and IIaaS. Users access and use cloud resources through the Internet, and only need to pay for the use of cloud resources. For the construction and maintenance of cloud resources, the internal deployment and structure of cloud resources need not be concerned. Utilize cloud computing and use distributed computing to obtain storage and computing capabilities, replacing local computers or remote servers.

Cloud computing integrates server clusters, highly reliable IDCs, and various applications. The system implements automated management to provide IT services to customers. The main characteristics of cloud computing include the following aspects: cloud computing has a resource sharing pool, the information system integrates, classifies, and outputs various resources, and outputs related information according to different instructions; Cloud computing performs self- data calculation without human operation; cloud computing outputs services to the outside in a unified manner, and users access the cloud as needed, and are divided into application services, infrastructure services, and platform services according to the required service level; The computing access function is extensive, allowing multiple terminals to access through standard mechanisms.

Financial management model based on cloud computing in the context of big data

In the context of big data, cloud computing technology realizes resource sharing through the Internet and virtual technologies. Centralizing all resources in the cloud storage center can provide powerful data processing and data storage services for enterprise users. Enterprise users only need to use simple terminal

devices, purchase the service, and enjoy the storage resources and data processing functions provided by cloud computing services through the Internet. The enterprise's data information center will run on the Internet. Enterprise applications can flexibly switch computer resources according to different business access requirements and flexibly configure the enterprise. Information processing capabilities, greatly reducing information processing costs.

2 Construction of financial computing service center based on cloud computing

Internet technology is widely used in enterprises, and networking provides a technical foundation for companies to collect various types of big data. Based on the maturity of big data analysis technology, research and build and develop cloud computing financial shared service center services.

2.1 Finance cloud management structure

Finance cloud is the application of cloud computing technology in the financial sharing service center. In cloud computing, the client and the cloud are two important modules. The client is the port through which the user accesses and obtains information, providing users with accurate information. In the cloud, the structural layer is composed of four layers. The application layer continuously improves services such as guarantee management and fund management. The data management layer provides information support. The network service layer uses network storage, email, and web addresses to improve basic network services. The detailed structure diagram of Finance Cloud is as follows:

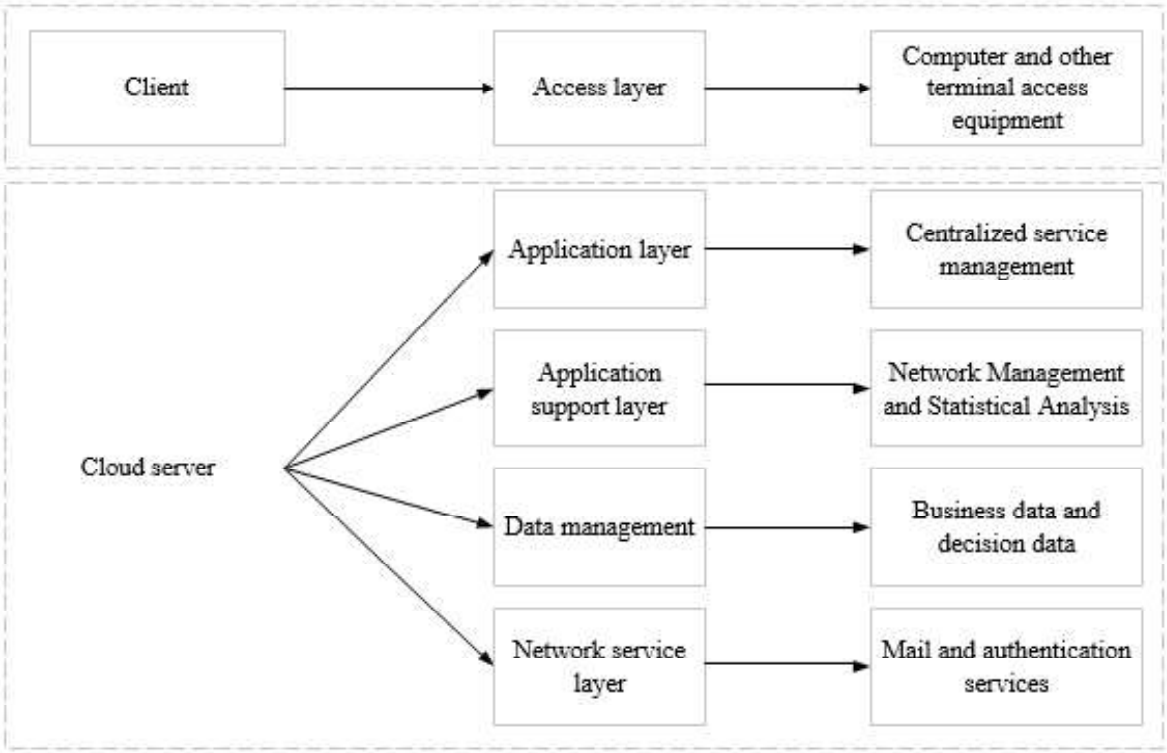

Figure 1. Detailed structure of the financial cloud

2.2 Model and Construction Strategy of Financial Shared Service Center Based on Cloud Computing

English units may be used as secondary units (in parentheses). The financial shared service center involves many departments and staffs, and to deal with many matters, it is necessary to make a design plan for the construction model in advance and formulate a construction strategy suitable for its own characteristics. The cloud computing-based financial shared service center construction model roughly includes processes, organization and human resources, information systems, and operations management.

Build strategy. The process of developing normative standards, including activities such as receiving input and generating output. Process design and reengineering include scheme planning and design, test improvement and process optimization; According to different strategic goals of cloud computing financial shared services, rationally arrange and organize organizational structure and staffing, and establish a performance evaluation system; Build an information system; build an integrated operation and management system based on the value chain.

The construction model of corporate financial shared services is shown in Figure 2.

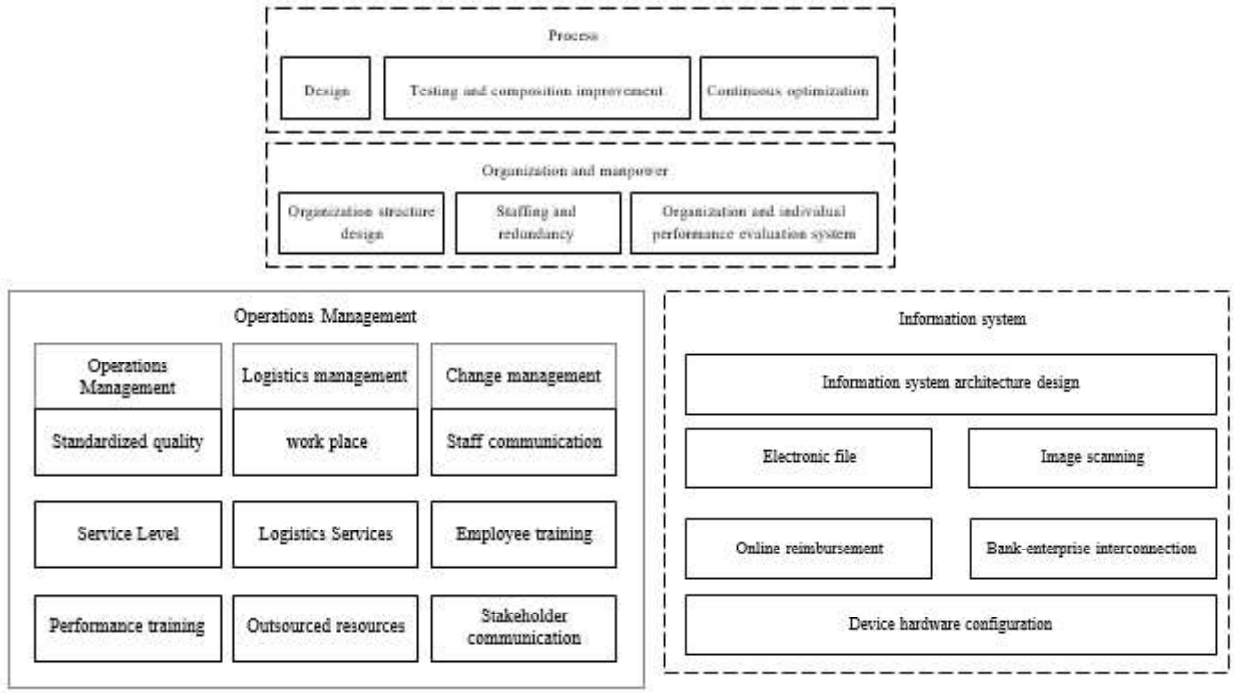

Figure 2: Enterprise cloud computing financial shared service construction model

2.3 Optimization Design of Financial Information System Based on Cloud Computing

Determine the process design and operation model of the financial shared service center, and build a financial management architecture based on cloud computing. The cloud server includes an application layer, a data management layer, a network service layer, and an application support layer. Among them, the network service layer is responsible for providing network services: the application support layer provides technical support; the data management layer is responsible for data classification and storage; the application layer provides services such as financial accounting and fund management. The user accesses the financial information system through the client, obtains the required information, and interacts with the

cloud for financial information operations.

The cloud computing-based financial shared service center mainly applies information system architecture in three aspects: operation management, accounting, management control and auxiliary accounting. Among them, the accounting remains unchanged, and the fund management system and expense reimbursement procedures are updated. In terms of system interface, it is important to build the relationship between personnel and finance, and realize the cost of human resources. The information system architecture of the financial shared service center is shown in Figure 3.

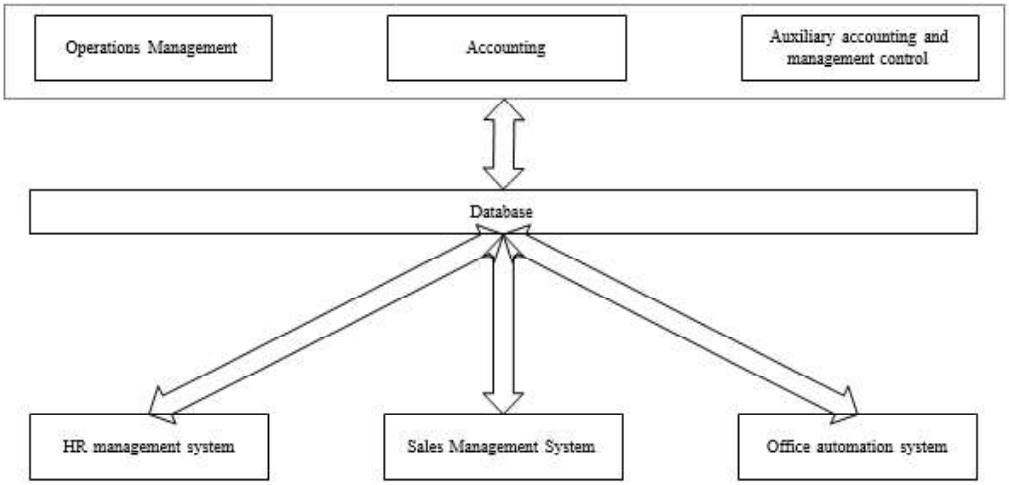

Figure 3. Cloud-based financial sharing center information system architecture

1.1 Apply cloud computing to enhance financial data integration and sharing

With powerful computing and storage capabilities, cloud computing can provide services in a timely manner according to user needs. Cloud computing is the foundation for building and enhancing financial sharing, IT storage capacity, data center facilities, security and software applications.

Cloud computing has powerful storage capabilities and data processing capabilities. Enterprises purchase cloud computing service storage and data processing technologies according to their actual conditions and needs. The more automated the financial information system is, the more financial cloud services can be provided to users. With the improvement of collaboration capabilities, human-driven services are transmitted to the cloud by establishing standardized interfaces. The location of the interface of the financial sharing service center is shown in Figure 4.

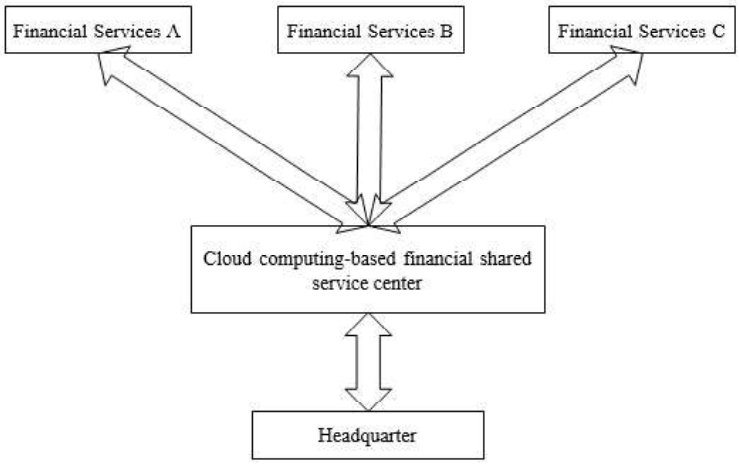

Figure 4. Interface bits of the financial shared service center

3. Operation process of financial management model based on cloud computing

According to the theory of cloud computing, relying on the management system, the collected business data is transmitted to the cloud, and the original files are decomposed according to the review requirements. Finally, vouchers and reports are automatically generated and output. The operation process mainly includes three parts: cloud collection, cloud processing and cloud products.

Cloud collection. In order to receive business data that reflects the actual occurrence of economic activity, transmitted to the cloud.

Cloud processing. Complete the classification, screening, storage and transfer of business data.

Cloud products. After cloud processing, the cloud platform covers a large number of element information, as well as traditional accounting vouchers. The output cloud products mainly include vouchers for the accounting of corporate fund receipts and payments, daily financial management vouchers and accounting statements; individual reports and consolidated statements; providing users with various financial indicators and data analysis. Figure 5 shows the overall operation process of a cloud-based financial shared service center.

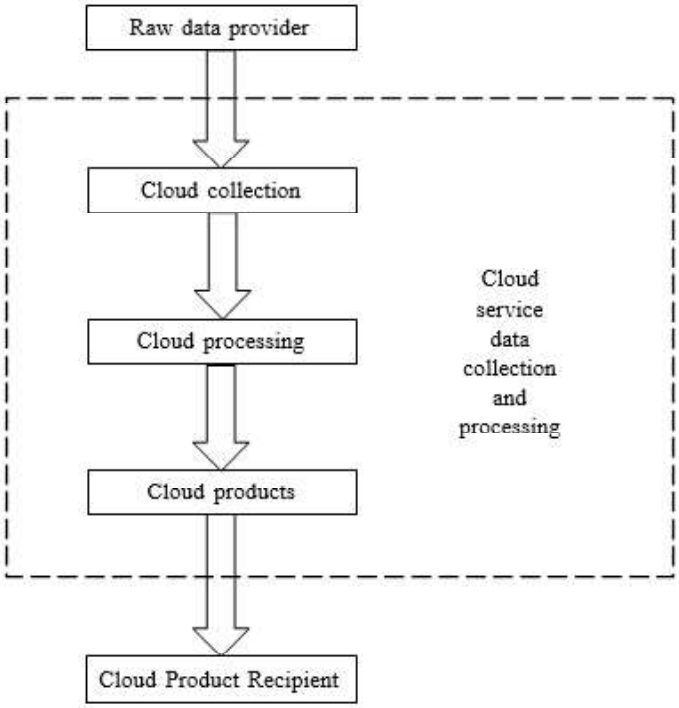

Figure 5. Cloud-based financial shared service center overall operation process

4. Conclusion

The use of cloud computing can promote the construction of financial shared service centers. With the development of computer information technology, cloud computing-based financial shared service centers can be perfectly combined with high technology. In the future, the financial shared service model will present a diversified, efficient and sustainable development trend. Based on cloud computing technology, it is an important task for modern enterprises to build an enterprise financial shared service center and study the financial management model that is suitable for the development of the times. Cloud computing

technology is maturing and is widely used in various industries. Enterprises rent cloud services to reduce the basic investment in financial sharing; adopt cloud storage to reduce the cost of information storage; use cloud computing to improve the performance of information systems and make financial sharing service centers more powerful.

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2

How Do HRM Practices Relate To Innovation Performance In Information Technology Firms

Abstract

This paper investigates the relation between Human Resources Management (HRM) and innovation/ performance in four firms operating in the Information Technology sector. A qualitative multiple case study methodology was used, and data collection included a documentary information analysis, and semi-structured interviews were held with HRM and innovation-related functions. The main results revealed that HRM practices are related to the best innovation and performance outputs. Moreover, some sector-specific HRM practices- Innovation/performance relations were found, with which prepositions are proposed. There is a high level of recruitment and selection, as well as compensation (salary, benefits and non-financial pay) practices due to the increasing need for these professionals in the labor market. Considering the generalization of compensation and benefits practices in the IT sector, it seems that the production of patents/utility models in organisations is more related to the investment in training and development, then to compensations and benefits practices. Few HRM practices that focus on promoting autonomy and self-management have a positive effect on innovation and can be at least as effective as a wider number of corporate HRM practices. This study contributes to the HRM relation to innovation performance literature, by its qualitative and longitudinal nature, the use of objective innovation and performance measures, and the prepositions specific to the IT sector that are suggested for future validation.

Introduction

Increasing globalization and business dynamics encourage companies to become innovative in responding to threats and opportunities that arise in this competitive market (Donate, Penã and Pablo, 2016). Human resources management (HRM) researchers and practitioners have focused on the relationship of their practices with organizational performance (e.g. Boselie, Paauwe and Jansen, 2001) and with innovation (Chen and Huang, 2009; Diaz- Fernandez, Bornay-Barrachina and Lopes- Cabrales, 2017; Jiménez-Jiménez and Sanz- Valle, 2008; Shipton, Fay, West, Patterson and Birdi, 2005, Hong, Zhao and Snell, 2018, and Seeck and Diehl, 2016), as well as the performance-innovation binomial (Gomes, Hurmelina and Olander, 2018). We are currently witnessing an outpouring and growth of technology companies globally and locally, and the HRM practices link to innovation and performance in technological firms is not explicitly studied. Challenges presented by this sector, namely its volatility,which is subjected to rapid technological changes (McAfee and Brynjolfsson, 2008), pressured to continually adapt to market (Pan, Huang and Gopal, 2016), and technological changes (Becker and Gerhart, 1996), explain the need for constant innovation if they want to survive and much more if they want to improve organizational performance.

People are at the center of innovation and the way people are managed, through HRM practices, affects innovation (Galbraith 1984, and Jiménez-Jiménez and Sanz-Valle, 2008). However, despite a growing increase in publications in this domain, this field of research is fragmented and presents some gaps that this paper aims to fill with this study, namely regarding the measurement of HRM practices and innovation, as well as the research design since there are few qualitative, longitudinal and comparative studies (Seeck and Diehl, 2016). These gaps present an opportunity to investigate further: *How do HRM practices relate to*

innovation/performance in information technology (IT) firms?. Specifically, the aim is to: (1) identify and characterize HRM practices adopted on the studied firms; (2) identify and characterize innovation/performance; and (3) analyze the relationship between HRM practices, performance and innovation in IT firms.

The contribution to this exploratory study is to expand the existing literature in the HRM-innovation and performance link in the specific context of the Information Technology (IT) sector. The next sectionperforms a review of the literature on the concepts of HRM practices, innovation, performance and the link between them, followed by the presentation of the methodology and the results of the multiple case study performed. Finally, this study discusses, concludes and highlights some prepositions that can be used for future verification.

Literature Review

There is an extensive literature that links HRM practices to organizational performance; some meta-analysis which examined that relation are: (e.g. Combs, Liu, Hall and Ketchen, 2006; Posthuma, Campion, Masimova and Campion, 2013; Rauch and Hatak, 2016 and Subramony, 2009). Rauch and Hatak (2016) studied 56 independent samples of small and medium sized enterprises. They organized the studies in the dimensional human resources (HR) enhancing practices model proposed by Subramony (2009), which in turn was inspired by the AMO (ability, motivation, opportunity) framework: skill-enhancing, motivation-enhancing and empowerment- enhancing practices. Posthuma et al. (2013) aiming to create a high-performance work practice category guide, analyzed data collected in 193 journal articles and published between 1992 and 2011, and found 61 individual practices, organizing them into nine categories: (1) compensation and benefits, (2) job design, (3) training and development, (4) recruitment and selection, (5) employee/work environment relationships, (6)communication, (7) performance management and evaluation, (8) promotions/ progression and (9) turnover, retention and exit management.

Studies that link HRM to innovation show that the capacity of an organization to innovate relies on the skills and motivation of its employees (Jiménez-Jiménez and Sanz-Valle, 2008). However, there are several approaches to HRM practices measurement when relating them to innovation. Usually, the scholars, based on literature, decide which are the best HRM practices to search for and measure, studying them in bundles, different in their content (e.g. Shipton et al. 2005, and Verburg, Den Hartog and Koopman, 2007), and which Seeck and Diehl (2016) point out that they have not been consistent (see also Posthuma et al. 2013 for a deeper discussion). This study identifies the HRM practices bundles used by each firm, which allows understanding the choices of each firm, in a deeper way into the analysis. To do that, Posthuma et al. (2013) work is used as the theoretical model for HRM practices in the present work due to the recency of the study when compared to several others, also it is the model based on the widest range (and number) of studies, and this model covers a large number of individual HRM practices which is adequate, given the exploratory nature of the present study.

Furthermore, the same inconsistency in operationalization and measurement is evident when the studies in the field of innovation are analyzed (Seeck and Diehl, 2016). The review of the innovation literature shows that this is a very broad and complex domain (e.g. Damanpour and Schneider, 2006; Lousã and Gomes, 2017 and Wolfe, 1994) and highlights the existence of different phases, types and operationalizations of innovation. The present study intends to contribute to a better operationalization of innovation measurement adopting a more comprehensive and integrated model of the innovation dynamics (see Lousã and Gomes, 2017 for a deeper discussion). As Adams, Bessant and Phelps (2006) mentioned, the fragmentation of innovation measurement is due to their focus either on innovation inputs or outputs measurements.

According to OECD (2005), innovation is about the implementation of a new or significantly improved

product (good or service) or process, a new marketing or a new organizational method in business practices, workplace organization or external relations. The product innovation concerns the introduction of a new good or service or a significant improvement concerning its expected characteristics or uses, which includes significant improvements in technical specifications, components and materials, embedded software, ease of use or other functional characteristics. Process innovation refers to the implementation of a new or considerable improvement in the production or the delivery method, covering changes in techniques, equipment and software. Marketing innovation refers to the introduction of a new marketing method, which involves changes in product design or packaging, product placement, product promotion or pricing. Furthermore, organizational innovation includes the implementation of a new organizational method in the business practices, in the workplace, or in its external relations. Lousã and Gomes (2017), based on previous literature (e.g. Amabile, Conti, Coon, Lazenby,& Herron, 1996, and Damanpour and Schneider, 2006), expanded this notion of innovation considering that this process involves the creation of new ideas or significant improvements and the implementation of those ideas in products or services, business processes, work organization and marketing.

Lousã (2013) developed and built an innovation model, combining a series of objective and perceptual indicators in order to understand how innovation occurs within and between different industries or companies, namely the information technology sector. This model has three dimensions: Resources, Processes and Results. *Resources* refer to the characterization of human resources, available resources and expenditure on encompass partnerships and networks of cooperation and protection and application of knowledge. Finally, *Results* consist of the turnover of the last three years; the evolution of product/service sales or significant improvements in the last three years; and the percentage of ideas generated and transformed into innovative projects and the image of the company. As Lousã and Gomes (2017) pointed out, these indicators seem useful not only to compare innovation activities between companies but also to understand their innovation dynamics within each company. Interestingly, the results dimension indicators in the innovation model are the same as organizational performance indicators when studying the HRM- performance link (turnover, commitment, employee growth, revenue and sales) (e.g. Boselie et al. 2001 and Huselid, 1995). So this study will refer to the set of these indicators as innovation performance.

At last, another gap, which the present investigation seeks to fill , refers to the methodologies used in the investigations that have linked HRM practices to innovation, as Seeck and Diehl (2016) referred that the qualitative studies in this area are scarce, and the realization of qualitative, longitudinal and comparative studies are recommended to a better understanding of this dynamic.

Methodology

This study is exploratory and adopted a qualitative multiple case study methodology. It developed a data collection protocol to perform the data collection process with the best reliability (Yin, 1994).

The data collection process included a semi- structured analysis and the analysis of documentation by each firm such as published articles, reports, websites and the database that contains comprehensive information on companies in Spain and Portugal – SABI (Iberian Balance sheet Analysis System).

Participants

The four firms studied in this multiple case study research were selected based on the sector information technology), the same city (geographical area) and the convenience of the research team.

A total of seven participants were interviewed (4 performing HRM functions and 3 performing innovation-related functions) from four IT firms in Porto, Portugal. The participants worked in the company from 1 to 17 years and the majority have university degrees qualifications. Companies were founded from 5 to 18 years ago (cf. Table 1). The firm's activities are displayed in Table 1.

Table 1 : Characterization of the case studies

	Firm A	Firm B	Firm C	Firm D
Founded in	2001	2014	2008	2009
Companies' legal forms	Public limited company	Public limited company	Single-member limited company	Public limited company
Number of business partners	3	5	1	1
Number of employees	18	133	58	20
Businessfield	Web applications	Web and mobile applications	Multichannel platform of digital marketing	Higher education management software and HRM software for public services
Academic qualifications and HRM Responsibility	Engineering/Founders (n=3)	No HRM role assigned formallyas a strategicoption (n=0)	Psychologist/Hum an Resource Director (n=1)	Engineering/Shared by the General manager/ Chief Architect/ Chief Operating Officer(n=3)
Academic qualifications of Innovation Responsable	Engineering	Engineering	Engineering	Engineering

Data Collection Instrument's

The dominant strategy for data collection was the semi-structured interview. In order to ensure the validity and accuracy of the data to be collected, the interview guide was reviewed by two innovation and HR experts and was pre-tested.

The interview guide had four parts: characterization and evolution of the organization, HRM practices, performance and innovation. Specific questions were elaborated for the participant who performs the HR roles, such as "*What are the HRM practices adopted in the organization and how do you characterize them?";* and other questions for the participant who performs the innovation-related roles, such as "*How does the innovation process unfold?*"; "*Which HRM practices contribute most to innovation?*, and "*Is the innovation process carried out intentionally?*" Information was also requested regarding the identification of the organization, the date of the interview, and the characterization of the participant, his educational background, number of his employment years and his role in the organization.

Procedures and Data Analyses

The interviews took place at the premises of the participating companies. The interviews have an average duration of 60 minutes. Data collection started in September 2018 and ended in April 2019.

This studyused the content analysis of the interviews conducted and the information on the website and the professional and social networks of each organization, as well as the information contained in the documents provided by companies and data reports collected in the SABI database (Bardin, 2018).

The validity of the analysis and coding process was ensured by the consultation of two independent researchers who discussed and validated the categories throughout the data analysis process.

Results

To analyze the case studies, the following were considered: the nine HRM practices categories of Posthuma et al. (2013) together with their 61 individual HRM practices and the three innovation dimensions proposed by Lousã (2013) and Lousã and Gomes (2017), that include the performance indicators as productivity (ratio of turnover per employee) (Huselid, 1995), profit per employee (necessary to have a comparative

base-line of analyzes) and employment growth (number of employees at a fiscal year) (Rauch, Frese and Utsch, 2005).

Human Resource Management Practices

The HRM practices of the four case studies were analyzed according to the categories proposed by Posthuma et al. (2013) and the relation to innovation mentioned in the interviews. Results are summarised in Table 2 and detailed in Appendix A.

The most commonly used categories of HRM practices are Recruitment and Selection (n=16) (firms C, n=6 and C, n=4)), Compensation and Benefits (n=14) (firms A, n=5 and D, n=4), Job and Work Design (n=10) (firm B, n=5), Training and Development (n=10) (firms C, n=4 e and A, n=3), and Performance Management and Appraisal (n=9) (firms A, n=4 and D, n=3).

Firm C is the one that uses the widest range and number of HRM practices (n=24), followed, from some distance, by firm A (n=19). Both firms; B and D, use less HRM practices.

Although all firms acknowledge the importance of their employees and of HRM practices to attract, develop and retain them, maybe due to the recognition of qualified labor in the market in this specific sector, they all address the "people issue" differently. The interviews allowed to understand the philosophy underneath the practices.

Table 2 : HRM categories in the case studies (Postuma et al., 2013)

Categories of HRM practices	Firm A	Firm B	Firm C	Firm D	Total
Compensation and Benefits	5	2	3	4	**14**
Job and Work Design	1	5	2	2	**10**
Training and development	3	1	4	2	**10**
Recruitment and selection	3	4	6	3	**16**
Employee Relationship / Work Environment	0	2	3	0	**5**
Communication	2	2	2	1	**7**
Performance Managementand Appraisal	4	0	2	3	**9**
Promotions / Progression	0	0	2	0	**2**
Turnover, Retention and Exit Management	1	0	0	0	**1**
Total number of HRM practices	**19**	**16**	**24**	**15**	
HRM relation to Innovation	All practices	All practices, accent on employees self-manageme nt	All practices; emphasizes on Recruitment and Selection	Integrated on a daily informal environme nt, but not intentionally implement ed	

Generally, all firms use HRM practices intended to enhance innovation and performance, however, firm D informally does that, as the daily environment unfolds.

Firm C emphasizes recruitment and selection as a means to increase its pool of talent and enhance innovation and performance, which is congruent with the high number of practices. Firm B, in its management philosophy, intentionally does not have any structured process, including the people related ones. This management posture explains a higher number of job and work design since the emphasis is on self- managed teams, autonomy, decentralized decision making, which allows to understand that there may be a lot of HRM practices going on, but in an informal and not structured way, aiming at fulfilling the employees' needs. Alternatively, the HRM practices that are going on informally are occasional and on-demand according to employees need, that is to say organically, and therefore not reported as 'HRM practices' because it is not

felt in that way. There is a difference regarding firm D, which, being informal in its environment, does not have the intention of that informality. It is also interesting to note that firm B is the one that reports a fewer number of practices related to compensation and benefits, which may be due to the managing philosophy that emphasizes autonomous job and work design.

Innovation and Performance

To characterize innovation in the four case studies, this study refers to the period from 2015 to 2017 and uses the innovation model dimensions of Lousã (2013): Resources, Processes and Results of Innovation. The Results of Innovation are the same as Organizational Performance indicators (Table 3). This study performed a more detailed analysis of firms B and C, and a less detailed analysis of firms A and D, as it was not possible to access most of the data.

Table 3 : Innovation dimensions by Lousã (2013) in the case studies

Innovation dimensions	Firm A	Firm B	Firm C	Firm D
Resources				
Number of employees (2017)	18	133	58	20
Percentage of staff involved in lifelong learning/ training activities (variation, Δ,2015-2017)		90% (Δ=0)	36% (Δ= +22)	
Investment in R&D (variation (Δ) 2015-2017)		Δ=+31%		
Processes				
Partnerships and Cooperation – Clients number and variation (Δ)		3 (Δ= +2)	1 (Δ= 0)	
Partnerships and Cooperation with higher education institutions: - Partnership in master degreedissertation - Curricularinternship - Recruitment - Job fairs in several universities		X X X X	X X	
- Seminars/talks in universities by employees				
Protection and enhancement of knowledge(number of patents)			1	
Internal activities for innovation	Based on proposed ideas, their registration, evaluation and implementation	Ideas come up after fortnightly meetings where the team looks at how to improve the work for the project concerned and the work environment (not during the meetings)	Ideas come from various sources: conversations between employees, brainstorming, programming marathons, and the CEO. Subsequently, a proof of concept, implementation and production	Idea generation - brainstorming, Product design, functionality and testing before entering the market.

Table 3: Innovation dimensions by Lousã (2013) in the case studies*(Continues)*

Innovation dimensions	Firm A	Firm B	Firm C	Firm D
Certifications	Not anymore, used to be certified by NP 4457 2007 (Research, Development, and Innovation Management)			
Results / Organizational performance				
Types of innovation - Product - Process - Organizational - Marketing	X	X X	X X X	X
Variation of sales (Δ) 2017-2015*	+6%	+73%	+66%	-1%
Productivity per employee * - variation (Δ) 2017-2015 - comparison between cases	+6% 10%	-13% -19%	+27% 100%	+23% 19%
Profit per employee*				
- variation (Δ)	+55%	-9%	+26%	-8%
Volume of sales of new products/services or those that significantly improved (Number and variation, Δ)		3 (Δ=+2)	1 (Δ=0)	
Employment growth* - variation (Δ) 2015-2017 - comparison between cases	Δ= 0 0%	Δ= +102 100%	Δ= +22 23%	Δ= -4 -4%

** Source SABI*

Regarding *resources* in the innovation model, there are two small firms (A, n=18 and D, n=20) and two medium-size firms (B, n=133 and C, n=58). There is a higher percentage of employees in firm B that participate in training than firm C. However, only firm B mentioned investment in research and development, in which the budget increased by 31% from 2015 to 2017.

In what comes to *processes* of the innovation model, Firm B increased the number of clients in the period under study (n=3) and has a wider range of types of cooperation with Higher Education Institutions. Firm C holds one patent.

Findings show that there are no formal or regular procedures in neither case studies regarding the innovation activity and that it happens in an emerging and organic way. Generally speaking, in firm A, it is based on ideas, registration, evaluation and implementation. Although it is not certified any more, firm C, during the period in which it was certified, integrated the structure and the philosophy of the Research, Development and Innovation Management norm. Firm B refers that the ideas usually come up retrospectively, i.e. after fortnightly meetings where the team looks at how to improve the work for the project concerned and the work environment. In firm C, ideas come from various sources: conversations between employees, brainstorming, programming marathons and the CEO. Subsequently, a proof of concept, implementation and production is performed. Innovation activity in firm D begins in meetings that favor a creative environment after approved ideas; there is product design, functionality and testing before entering the market. Although

not formalized, Firm D meets the phases defined by Dantas and Moreira (2011), namely strategic reflection, generation of new solutions, implementation and dissemination.

None of the case studies referred to the marketing type of innovation. Firm C stated that it has product, process and organizational types of innovation. Firm B mentioned being innovative regarding product and organizational issues. The other firms (A and D) only refered to innovation on the product level.

Firm B is the biggest firm in this study (n=133) and the one that grew the most employees (+102) during the three years under study. Firm B is also the one with a negative variation of productivity and profit, when compared to the other case studies. The longitudinal data of this study allows to understand that these negative results are due to the firm's fast growth.

Firm C is the one with the highest productivity among case studies as it grew with 23 employees. It is not the one with the best profit per employee, even though it is positive (+26%).

Firm A has the highest variation of profit per employee between 2015 and 2017 (+55%). Firm D decreased the number of employees as well as the profit in this period, up to a negative level (-9%).

Discussion and Conclusions

To investigate the specificities of the relation between HRM practices and innovation/performance in IT firms, four case studies in this sector were studied.

When analyzing the HRM practices, findings show that recruitment and selection, as well as compensation and benefits, are the most used in the studied firms. This result is congruent with the war for talent that the high-tech industry is facing (Hays, 2019 and OECD, 2019). While OECD (2019) annual employment outlook report highlights the labor market's megatrends driven by the technological change, Hays' (2019) study shows that it is hard to recruit professionals due to the continuous and increasing need for the IT / high-tech sector. Hays (2019) refers to the small pool of talent and also the fact that candidates are not much available for a change. This study also showed that professionals value the salary offer and the career plan, which is consistent with the study of Schlechter, Hung & Bussin (2014) that shows that high levels of remuneration, benefits and variable pay are necessary to attract this kind of workers. Although a high level of compensation is attractive in all industry sectors, the preposition that is specifically related to the IT industry can be formulated as follow:

Emphasis on recruitment and selection, as well as a high level of compensation (salary, benefits and non-financial pay) are characteristics of HRM practices in the IT industry, as a result of an increasing need for this kind of workers; therefore, they are not distinctive among firms in this industry.

Even though literature and the findings of this study point out that HRM practices bundles, which complement the effect of each other, have the biggest effect on innovation (e.g. Seeck and Diehl, 2016), some studies research the effect of individual practices. When considering the

IT sector, Laursen and Foss (2003) found that the HRM system that emphasized training performed better.

Contingent pay, when analyzed individually, seems to harm innovation (Seeck and Diehl, 2016). However, the effect of contingent pay had a positive effect on innovation when combined with other HRM practices that aimed at promoting exploratory learning (Shipton et al. 2006). These findings are also congruent with Li, Zhao and Liu's (2006) study of Chinese high-tech firms which concluded that: material incentives and fixed or material performance targets have a significant negative effect on innovation, while training, non-material incentives, work feedback and collaboration have a positive effect.

This study's findings seem to confirm these results. Firm B was the only firm that did not have contingent pay or bonuses, or performance management or appraisal, and had the fastest growth and innovation. Also, it did not mention many training activities, compared to the other firms, yet they reported that 90% of their staff engage in training activities. Also, the other firms which have contingent pay and performance appraisal systems, because they also have training activities, the negative effects of the primer are balanced by the positive effects of the later.

Overall, the categories of HRM practices that bring together the most significant number of individual practices in the four-firm studies are compensation and benefits, and recruitment and selection. Analyzing the compensation and benefits category is one of the most commonly used HRM practice categories in firm studies. Firm C has the same number of individual practices as Firms A and D. In the training and development category, Firm C brings together a more significant number of individual practices compared to the other firms and has a patent (utility model; called smart SMS).

This finding points to the following preposition:

it seems that the production of patents/utilitymodels in organisations is more related to the investment in training and development thento compensation, considering that in a "war for talent" context, Compensation and Benefits practices is generalised in the IT sector.

Literature shows a positive relationship between human resource management and innovation (De Winne and Sels, 2010; Jiménez-Jiménez and Sanz-Valle, 2008, and Shipton, West, Dawson, Birdi and Patterson, 2006), which seems to be confirmed by data in this study.

Firm C is the firm which, by far, uses the higher number of HRM practices and also the one with the very good innovation indicators: partnerships with higher education institutions, types of innovation, productivity, profit and employment growth. It is the firm that has more types of innovation, and also the best productivity and profit results throughout the three years under study while growing in the number of employees. At the same time, Firm D is the one that uses the least number of HRM practices, mainly focusing on the compensation and benefits practice. It is the one that acknowledges that there is no special alignment between HRM practices and innovation and performance indicators, they 'happen' in the informal way of working. Moreover, innovation and performance results are the worst among the studied firms. This data confirms the relation between HRM practices-innovation performance.

Firm B's findings bring something that seems controversial to the relation between HRM practices and innovation performance. This firm, HRM wise, refers to few HRM practices when compared to the other firms, and at the same time, has the best employment growth. It was the one that increased the number of clients, as well as the best sales increase regarding new products. Only the productivity/profit per employee

has decreased, because of this rapid growth.

Regarding HRM practices, this firm is also different since it states its management

philosophy, not having formally defined processes, and granting autonomy to its employees and teams to self-manage. This management style is congruent with the HRM practices included in the Job and Work Design category, such as participatory and decentralized decision making, self- managed work teams, extended task liability and flexible schedule. Job and Work Design practices are the ones that are the most referred to in this firm. At the same time, there are not many HRM practices, when compared to other firms, which is also congruent with the philosophy of not having formal procedures. However, since employees and teams work in a self satisfactory way, the HRM practices may occur only in an informal random way, only when they are considered necessary. This kind of practice relates to employees' motivation and satisfaction and influences employees allowing them to utilize their skills in the job (Berg, 1999).

Perdomo-Ortiz, González-Benito and Galende (2009) found that autonomy positively affects non-technological innovation. The data in this paper extend this result to the technological field of innovation. The preposition which is specifically related to the IT industry can be formulated as follows:

HRM practices that aim at autonomy and self-management have a positive effect on innovation in the IT firms and can be at least as effective as corporate and formal HRM practices.

Contributions to literature

Few qualitative studies are investigating the HRM-innovation-performance link (Seeck and Diehl, 2016), even though the results of this study are consistent with previous studies (e.g. Jiménez-Jiménez and Sanz-Valle, 2008, and Seeck and Diehl, 2016) so far as it emphasizes that human resources practices can support innovation and organizational performance, with the prepositions that are specific in the IT sector. This study has contributed to advances in this field of study.

The analysis of the three years instead of a cross-sectional analysis and the use of the objective measures are interesting methodological features in the present study since most of the innovation and performance measures existing in the previous literature are perceptive. Findings using this type of measure add interesting support to prior studies.

Limitations and Future Research

One limitation to point out in this study was the difficulty of collecting relevant data from some of the firms. Considering the informality of the approach to innovation of the firms, further analysis was difficult.

The scarce literature on the specific sector and the methodological approach used allowed the authors of this paper to deduce prepositions. These prepositions should be used as clues to future research and to better understand the relationship between HRM practices and their impact regarding performance and innovation. The prepositions of this study may underpin hypotheses for further quantitative studies and in various contexts within the IT sector. It is also relevant to study further the various dimensions of innovation performance so that new researchers can pursue and increase the scope of the presented analysis. Finally, it is necessary to underline the contribution of this study to future literature and research, as there are few studies related to the HRM practices- innovation-performance relation in the IT sector.

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Appendix A – Detailed HRM practices in the case studies (Posthuma et al., 2013)

HRM categories and their individual HRM practices	Firm A	Firm B	Firm C	Firm D
	19	**16**	**24**	**15**
CompensationandBenefits	**5**	**2**	**3**	**4**
Pay for performance	x		x	x
Payment by a formal assessment	x			x
Market Compliant External Pay Equity / Salary Bands	x			
Incentive system				
ComprehensiveBenefits	x	x	x	x
Profit-Sharing				
Pay for team results				
Payment for skills/knowledge		x		
Employeeswithshareholderparticipation				
Performance BonusorPrize	x		x	x
Equitablepayment processes				
Public Recognition / Non-Financial Rewards				
Job andWork Design	**1**	**5**	**2**	**2**
Participatory and decentralized decision making		x		
Project teams or other temporary teams				x
FunctionAnalysis				
FunctionRotation				
Self-managed work teams (quality circles)		x	x	
FreedomandAutonomy		x		
Job Enrichment				
ExtendedTaskLiability		x		
Flexibleschedule	x	x	x	x
Training anddevelopment	**3**	**1**	**4**	**2**
Training Investment (hours, budget)	x	x	x	x
Using training to improve performance			x	x
Training and development of company-specific skills	x		x	
CareerDevelopment Training				
Training Evaluation				
Multidisciplinary training				
Training and mentoring new employees	x		x	

Appendix A (Continues)

HRM categories and their individual HRM practices	Firm A	Firm B	Firm C	Firm D
Recruitment and selection	**3**	**4**	**6**	**3**
Hiring selectivity or low selection rate				
Specific and explicit hiring criteria			x	
Using Multiple Selection Tools	x	x	x	x
Structured job tests or interviews	x	x	x	x
Personnel selection and hiring process planning			x	
Candidate framework with company strategy		x	x	
Innovative Recruitment Practices	x	x	x	x
Employee Relationship / Work Environment	**0**	**2**	**3**	**0**
Job security / Emphasis on permanent employment			x	
Low hierarchical differentiation		x		
Formal Complaint Procedures				
Evaluation of Employee Relations Results				
Employee Attitude and Opinion Surveys			x	
Collaboration with Unions				
Family social policies and events		x	x	
Diversity and Equal Employment Opportunities				
Communication	**2**	**2**	**2**	**1**
Formal Information Sharing	x	x	x	
Program Information sharing regarding company strategy, business, results (performance)				
Suggestion System				
Frequent / regular meetings with employees	x	x	x	x
Performance Management and Appraisal	**4**	**0**	**2**	**3**
Assessment based on the outcome of objectives/behaviors	x		x	x
Evaluation for development / potential	x			
Frequent performance review meetings			x	x
Employee involvement in goal setting				
Written evaluation plan with defined objectives	x			

Feedback from multiple sources and peer review	x			x
Strategy based or team objective assessment				

Appendix A (Continues)

HRM categories and their individual HRM practices	**Firm A**	**Firm B**	**Firm C**	**Firm D**
Promotions / Progression	**0**	**0**	**2**	**0**
Internal Promotions				
Objectively merit-based promotions				
Career Planning			x	
Promotion Opportunities (e.g., Frequency)				
Career Plans & Career Progression Levels			x	
Succession Planning				
Turnover, Retention and Exit Management	**1**	**0**	**0**	**0**

3

The Effect of Human Resource Management Practices on Improving Performance and Innovative Behavior of State Civil Apparatus

Abstract:

This study aims to examine the effect of human resource management practices (high commitment HR practices) on the performance and innovative behavior of the State Civil Apparatus (ASN) both directly and through mediating variables of affective commitment and public service motivation in the context of bureaucracy simplification and changing the ASN work system due to the Covid-19 pandemic at the National Agency of Drug and Food Control (BPOM). By analyzing questionnaire data from 219 ASN BPOM respondents through a structural equation model (SEM) using the full version LISREL 8.51 application, this study found a direct and positive effect of high commitment HR practices on employee performance, affective commitment, and public service motivation. This study also found a positive relationship of public service motivation on employees' affective commitment, performance, and innovative behavior. However, the results of this study did not find the relationship between high commitment HR practices and employees' innovativeness behavior and the relationship between affective commitment and employees' performance and innovative behavior. This study concluded that high commitment HR practices were associated with increased employee performance but did not affect increased innovativeness behavior. Public service motivation mediated a positive relationship between high commitment HR practices and employee performance and innovativeness behavior, while affective commitment did not mediate this relationship.

Keywords*: High Commitment HR Practices, Affective Commitment, Public Service Motivation, Employee Performance, Employee Innovative Behavior.*

1. INTRODUCTION

The study of employee performance in the public sector is becoming increasingly important in the field of human resource management (HRM), especially in the context of public sector reform that adopts the New Public Management (NPM) and New Public Service (NPS) paradigms. Broadly conceived as implementing management ideas from the private sector into public services, NPM has changed administration works for two main goals: effectiveness and efficiency. Meanwhile, NPS focuses on providing more effective, efficient, responsive, and inclusive services [1]. Regardless of the extent of NPM reform in Indonesia, performance in the

public sector is now seen as output and outcome, not as previously viewed as an input and process [2].

In an era where changes happen very quickly, innovation in public services is also urgent to encourage public sector performance. Innovation has become a necessity in providing effective services to the community. Innovativeness refers to an idea, practice, or project considered new and could be applied. Although innovation in public management is often unacceptable at first because it is contrary to traditional

public administration problems, along with the dynamics of the external environment, public organizations must change the paradigm. The practice of innovation helps public institutions respond to change, meet stakeholder expectations, and justify governments as institutions that create social value [3].

As the global environment becomes more challenging and dynamic, many organizations rely on HR practices to overcome challenges and gain a competitive advantage. HR practices can improve skills, knowledge, creativity, synergism, commitment, and organizational results [4]. The fundamental weakness of civil service reform in Indonesia is the failure to radically overhaul human resource management (HRM) to create a performance- based system that is managed professionally, results- oriented and innovative in a more flexible working relationship that encourages optimal use of organizational capabilities [1].

Through implementing bureaucratic simplification policies, the Indonesian government seeks to improve the effectiveness and efficiency of public service performance. The simplification of the bureaucracy affects changing the institutional structure and trimming administrative positions into functionality positions that prioritize expertise and competence. The challenge of HR practice is how to improve the performance and innovative behavior of ASN to increase the effectiveness and efficiency of public services through the impact of HR practices on employee attitudes and behavior. The role of HR in the organizational change process is to create a workforce that can adapt and empower them to improve the quality of service to customers by creating high-performing employees who are functionally flexible in dynamic situations [5].

Research by Napitupulu et al. (2017) on the performance of public sector employees in Indonesia shows that career development (which is part of HR practices) has a positive effect on employee performance mediated by perceived organizational support, affective commitment, and work motivation. In addition, this study recommends further research to explore a broader model by adding new extrinsic variables, such as personal development, organizational development, and performance management [6]. Because these variables are closely related to HR practices, further research to investigate the impact of HR practices on employee performance will enrich the performance antecedents.

In addition to performance, employees' innovative behavior is also necessary for improving public sector performance. Research by Alfes et al. (2013) in a service sector organization in the UK found that employees' perceptions of line manager behavior and HR practices were positively related to performance and innovative behavior mediated by employee engagement. This study recommends further studies to explore the dynamics

between HR professionals and line managers in implementing HR practices and their influence on employee attitudes and behavior [7]. While research by Wright, Christensen, & Isett (2013) on local government employees in the southeastern United States who reorganized to realize service reform and cost efficiency found that public service motivation was positively related to affective commitment to change. Future research could investigate the generalizability of this positive relationship in various contexts of change [8].

Based on recommendations from those previous studies, this study intends to investigate the possible role that HR practices may play in influencing employee commitment and motivation to improve employee performance and innovative behavior in the public sector. Practically, this study tries to examine the main problems of government leaders to improve the quality of public service performance. This study also considers the mediating role of affective commitment and public service motivation to analyze the effect of HR practices as an independent variable on ASN performance and innovative behavior. Therefore, the

purpose of this study is to examine the influence of HRM practices both directly and indirectly (through mediating variables of affective commitment and public service motivation) on the performance and innovative behavior of ASN in the context of organizational change as the impact of bureaucratic simplification policies implementation and ASN work system changes due to the Covid-19 pandemic at BPOM RI.

2. LITERATURE REVIEW AND HYPOTHESES

2.1 New Public Management from the Human Resources Perspective

One of the primary impacts of NPM is the transformation of HR management. The main NPM principles that emphasize market-based values, incentives, and personal behavior form the basis of personnel reform. Popular private sector HR practice models such as high performance, high commitment, and high engagement have been introduced and tested. This was because it was thought that traditional public sector HR practices could be easily replaced to improve performance [9, 10]. Decentralization and devolution (delegation of power from the center to regional or state levels), performance management, and flexible service delivery are common HR transformations found worldwide. Other private sector best practices throughout the employee life cycle, such as recruitment and selection, compensation, training, retention, and work-life balance, are also widely adopted [10, 11].

HR transformation is defined as the 'desired or expected outcome of HR reform under the NPM initiative.' Two of Hood's (1991) NPM doctrines are related to HR: (1) professional management in the public sector and (2) private sector style emphasis on management practice. Professional management in the public sector includes active discretionary control seen from top management in public organizations [12]. Public organizations have done autonomy and devolution. Autonomy is flexibility in management, involvement in decision-making, and improvements in organization flexibility. Others have shown that NPM- type organizations can decide necessary matters on their own, including HR and financial. Devolution emphasizes the decentralization of decision-making from the central government. Through autonomy and devolution, administration accountability that can better meet customer needs should be through an 'entrepreneurial spirit' [10].

The emphasis on private sector management styles is also a necessary component of the NPM strategy. Some HR practices in the private sector include, firstly, selective recruitment and acceptance of external candidates based on specific qualifications and experience. Second, compensation by performance is the main criterion. Third, performance management emphasizes the need for effective performance appraisal and the linkage of performance with administrative and development objectives. Finally, adequate training and development can maximize performance [10].

2.2 High Commitment HR Practices (HCHRP)

High Commitment Human Resource Practices (HCHRP) is a term that describes a group of interrelated individual HR practices, such as training and development, communication, and rewards. These practices aim to develop and promote employee skills, motivation, and effort to improve employee attitudes towards the organization [9, 13]. This study focuses on the employees' perception of high commitment HR practices.

The HR practice approach used in this research is the high-commitment HR practices. Research on HR practices in the public sector in the UK reveals that several characteristics of public sector HR practices

are consistent with a high-commitment HR practice approach, namely: paternalistic management, standardization of employment practices, a collective approach to staff participation, and model work practices that emphasize equal opportunity and individual development [9].

Researchers of human resource management science had used behavioral theories, such as AMO theory (Ability, Motivation, and Opportunity), to explain why high commitment HR practices affect employee outcomes. Apart from private sector organizations, the AMO theory has also been implemented successfully in the public sector organizations [13, 14]. The AMO theory postulates that HCHRPs will improve employee performance by improving individual skills and abilities, increasing employees motivation for their discretionary efforts, and providing employees with more opportunities to use their skills, knowledge, and attributes in the workplace [15].

HR practices offer a prime role in improving employee performance, leading the organization to achieve its goals. Thus, organizations should consider HR practices as a core method to achieve their goals through employee performance [4]. Several empirical studies revealed a positive relationship between HR practices and employee performance [4, 16]. Thus, the hypotheses to be tested in this study are:

H1: High-commitment HR practices have a positive effect on employee performance

While there is a wealth of information about the causes, consequences, and strategies for organizational change, there are still many challenges to understand the change process. There is still a lack of evidence about employee reactions to change. Measuring employee commitment is one way to assess employee reactions to change initiatives [17].

Affective commitment refers to the emotional attachment, identification with, and involvement of employees in an organization [18]. Affective and normative commitment provide higher support for change than continuance commitment [19]. The broader commitment literature has revealed that affective commitment has a better influence on behavioral outcomes such as job performance and organizational citizenship behavior [20].

The empirical research found that HCHRP had a positive effect on improving employee outcomes, including higher job satisfaction, affective commitment, and lower intention to quit [15]. Thus, the hypotheses to be tested in this study are:

H2: High-commitment HR practices have a positive effect on employees' affective commitment

Although HRM is one of the subject core referenced by the literature on PSM, HR topics reported by PSM researchers are still few, so further studies are needed [21]. The empirical research findings establish the dimensions of PSM as a mediator in the relationship between high-commitment work practices and affective commitment, turnover intention, and job satisfaction [15]. This study highlights the importance of PSM as a specific motivation for HRM. Empirical research by Mostafa, Gould-Williams, and Bottomley (2015) show that PSM partially mediates the relationship between high-performance HR practices and employee affective commitment and organizational citizenship behavior [22]. One of the findings in this study also shows a direct and positive effect between high-performance HR practices and PSM. Thus, the hypotheses to be tested are: *H3: High-commitment HR practices have a positive effect on employees' public service motivation*

Innovation is valuable for organizations to maintain their long-term viability. It could be when employees exhibit innovative behavior in the workplace. Innovativeness behavior has received considerable attention from researchers, especially in exploring the factors that drive employees' innovation behavior. Innovative behavior is the intentional behavior of an employee in an individual, group, or organizational work role to create and implement new ideas [23].

Individual innovation is a multi-stage process that begins with problem identification and introduction to problem-solving ideas from internal or external practices. In the next step, an innovative individual promotes his ideas to other organization members. Finally, the innovation process includes planning and implementation schedules for new ideas to be used productively [3]. In the context of organizational change, innovation is necessary to provide alternative solutions so that organizations can adapt quickly to changes.

Several studies have contributed to understanding how various HR practices can produce positive organizational outcomes, including innovation [24, 25,

26]. Bos-Nehles and Veenendaal's research (2019) investigated the perceived influence of HR practices (compensation systems, training and development, information sharing, and supervisory support) on Innovative Work Behavior (IWB) moderated by an innovative climate. This study found that employees' perceptions of the compensation system were negatively related to IWB, while employees' perceptions of information sharing and supervisory support were positively related to IWB [27]. This study supports the hypothesis that the perceived role of HR practices affects the innovative behavior of employees. Thus, the hypotheses to be tested in this study are:

H4: High-commitment HR practices have a positive effect on the employees' innovative behavior

2.3 Affective Commitment

Some studies show that affective commitment is positively related to employee performance and negatively related to employee turnover [28, 29]. It is rooted in the concept of social exchange theory. This theory stated that when employees have positive work experiences, they are likely to be loyal to the organization and be more willing to optimize their efforts for the organization [30]. Several empirical studies [6, 31, 32] revealed that commitment had a positive effect on employee performance. Thus, the hypotheses to be tested in this study are:

H5: Affective commitment has a positive effect on employee performance.

Affective commitment fosters a sense of belonging and is generally associated with employees who are emotionally attached to the organization. Such individuals show a better ability to engage in organizational activities and are always ready to put in extra efforts beyond their duties towards achieving organizational goals [33]. Previous research has observed that employees who have a better commitment always present with creative solutions to work-based problems and show a greater tendency towards innovative behavior [34]. The empirical research reveals that affective commitment has a positive effect on the innovation behavior of employees [35]. Thus, the hypotheses to be tested in this study are:

H6: Affective commitment has a positive effect on the employees' innovative behavior

2.4 Public Service Motivation

Public service motivation is values, beliefs, and attitudes that motivate individuals to place the public interest

and larger political entities above personal and organizational interests [36]. Recent theoretical and empirical research confirms that PSM can be positively related to the commitment of organizational change efforts [37, 38, 39]. Several empirical studies confirm the positive relationship between PSM and employees' affective commitment to change [8, 22]. Thus, the hypotheses to be tested in this study are:

H7: Public service motivation has a positive effect on employees' affective commitment

Research by Schwarz, Eva, and Newman (2020) in public service organizations stated that PSM is positively related to individual performance. They argue that high committed employees see the work they do as meaningful. Because employees can do what they perceive as meaningful work and live their values and beliefs daily, this, in turn, is positively associated with increased individual performance [40]. Empirical research shows the positive relationship between PSM and employee performance [41]. Thus, the hypotheses to be tested are:

H8: Public service motivation (PSM) has a positive effect on employee performance

Rafique et al. (2021) investigated the impact of various dimensions of PSM on employee innovative behavior (IB) mediated by psychological empowerment (PSE) in public institutions in Pakistan. This study found that PSM dimension interest in policymaking, compassion, and self-sacrifice have a positive effect on the PSE of employees and their innovation behavior but the relationship of dimension commitment to the public interest with PSE and IB was insignificant [42]. Thus, the hypotheses proposed in this study are:

H9: Public service motivation has a positive effect on the employees' innovative behavior

2.5 Conceptual Framework

High-commitment HR practices aim to create a higher commitment of employees to support the optimal achievement of organizational goals. High committed employees will be more dedicated and loyal, perform better, and show a greater tendency towards innovative behavior. Thus, organizations should consider human resource practices as a core method for fostering employee commitment to achieving organizational goals through employee performance and innovation behavior. Perceived HR practices are also expected to encourage the internalization of public services and prosocial values as public service motivation. High motivated employees see the work they do as very meaningful. Because employees can do what they perceive as meaningful work and live their values and beliefs daily, this, in turn, is positively associated with improved employee performance and innovative behavior.

Thus, to increase the effectiveness and efficiency of public sector organizations, the contribution of HR practices is needed to increase employee commitment and motivation that, in turn, will encourage increased performance and innovative behavior of employees. In addition, empirical studies have proven that high commitment HR practices, public service motivation, and affective commitment can influence employee performance and innovative behavior [4, 6, 7, 8, 15, 26]. Based on the results of previous empirical studies, this research examines the direct influence of the variables of perceived HR practices on employee performance (H1), affective commitment (H2), public service motivation (H3), and innovative behavior (H4).

In addition, this study also examines the direct effect of the mediating variables of affective commitment (H5 and H6) and PSM (H7 and H8) on the dependent variable of employee performance and innovative behavior. This study also measures the effect of PSM on affective commitment (H9). Figure 1 presents a research model that describe the relationship between HCHRP on employee performance and innovative

behavior mediated by public service motivation and affective commitment.

2.6 Research Context

This research was conducted at the National Agency of Drug and Food Control (Badan Pengawas Obat dan Makanan, BPOM). The consideration of choosing BPOM as the research object is to see the role of HR practices in improving performance and innovation in public sector institutions during organizational change and the pandemic situation. As is known, after being mandated by President Joko Widodo during his inauguration as President of the Republic of Indonesia for the second term on October 20, 2019, bureaucracy simplification became mandatory in all ministries and government institutions in Indonesia. Even though in the Covid-19 pandemic situation, BPOM since 2020 has implemented a simplification of the organizational structure by cutting the structural positions of Administrator (Echelon III) and Supervisor (Echelon IV) from 641 to only 107 remaining, while 534 administrative officials transferred become functional officials.

As an institution that has the authority to supervise Drugs and Food in Indonesia, during the Covid-19 pandemic, the demands for the performance of BPOM's public services are increasing, related to efforts to accelerate the handling of the Covid-19 pandemic. It has been responded to by various efforts to accelerate public services, especially in drugs and vaccines for handling Covid-19. During the Covid-19 pandemic, BPOM has won several awards for its performance and innovation. In the field of performance report accountability, BPOM has succeeded in maintaining an Unqualified Opinion (WTP) on its financial statements for 7 (seven) consecutive years from 2014 to 2020. In the development of the integrity zone, from 63 work units (central and regional), 20 units the work unit has received the title of Corruption Free Area (WBK), and 1 (one) work unit has received the title of Clean and Serving Bureaucratic Area (WBBM). In the field of innovation, during the Covid-19 pandemic, BPOM also won several awards include Top 21 Public Service Innovations in handling Covid-19 from the PAN-RB Ministry for two types of innovations: (1)

Utilization of Cap Tikus liquor as raw material Hand Sanitizer; and (2) Testing of Covid-19 specimens at the PPPOMN Biohazard Laboratory; award for the category of Innovations in the Acceleration of Public Services from the 2020 Gatra Award; and Top 99 Public Service Innovation Competitions for BPOM Mobile Innovation in 2021.

Employee performance and innovative behavior are the foundation for organizational performance and innovation. In the context of BPOM, it is necessary to have reliable, high-performing, high innovations, and agile human resources of controlling Drugs and Food so that the organization will be able and always ready to face changes. This study wants to examine the contribution of HR Practices at BPOM in increasing employee commitment and public service motivation and its effect on improving employee performance and innovative behavior.

This study can contribute to the achievement of one of the missions of the BPOM organization related to human resource development, namely building superior human resources related to medicine and food by developing partnerships with all components of the nation to improve the quality of Indonesian people.

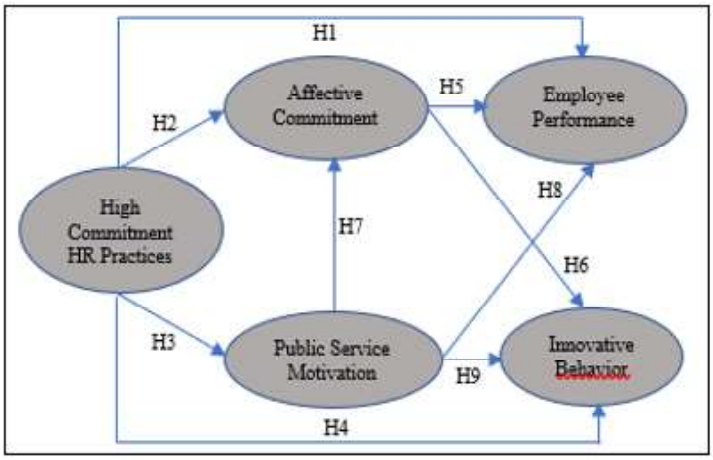

Figure 1. Research Model

3. RESEARCH METHOD

3.1 Sampling

This research was conducted at BPOM using the purposive sampling technique. Purposive sampling is sampling with criteria. The sample criteria in this study were State Civil Apparatus who worked in BPOM. The sample size in the Structural Equation Model (SEM) analysis depends on the number of indicators used in all constructing variables. The number of samples is the number of indicators of the formation variable, which is multiplied by 5 to 10 [43]. The number of indicators in this study is 43 items, so the minimum number of samples needed is 215 respondents. The questionnaire was
prepared from the research referenced and then translated into Indonesian. Filling out the questionnaire is voluntary and anonymous.

3.2 Variable Measurement

The measurement of the high commitment HR practice variable in this study adopted the research by Boselie (2010) based on the AMO theory. Questionnaire items adopted the research questionnaire of Gould- Williams et al. (2014). This questionnaire measured perceptions of high-commitment HR practices.

This questionnaire consists of 11 statement items divided into three dimensions: ability, motivation, and opportunity.

The affective commitment was measured using a questionnaire adapted from the research of Rhoades, Eisenberger, & Armeli (2001). This variable questionnaire consists of 6 statement items.

Public service motivation is a strong motive for performing meaningful public and social services. The measurement of public service motivation uses four dimensions adopted from Kim et al. (2013) that developed an international instrument to measure the four dimensions of PSM consisting of (1) Attraction to Public Service (APS); (2) Commitment to Public Values (CPV); (3) Compassion; and (4) Self-Sacrifice.

Performance is the result of working, achieved by an employee for carrying out his duties. Questionnaire items of employee performance adapted the research of Alfes et al. (2013) based on employee perceptions or self- reported performance. This variable questionnaire consists of 5 statement items. An example of a statement is I always complete my tasks as specified in my job description.

Questionnaire items of innovative behavior adapted the research questionnaire of Alfes et al. (2013) based on employee perceptions or self-reported behavior. This variable questionnaire consists of 5 statement items. The measurement scale is 1 (strongly disagree) to 6 (strongly agree).

3.3 Data Analysis

This research used structural equation modeling (SEM) by using the Lisrel 8.51 Full Version program to examine the direct effect between variables of the proposed model.

4. RESULT AND DISCUSSION

4.1 Demographic Characteristics of Respondents

This study grouped the characteristics of respondents based on gender, age, work unit, employment status, and frequency of work from home (WFH). The demographic characteristics of this study described the characteristic distribution of 219 respondents involved in this study (Tabel 1). The majority of respondents are female (76.7%), aged 31-40 years (58%), working in the central work unit (81.7%), employment status as civil servant (83,1%), and work from home at least two times a week (84.9%).

Tabel 1. Demographic Characteristics of Respondents

Government employees non civil servant		
WFH Frequency		
Min. 2 times per week	186	84,9
Work from office	33	15,1

4.1 Validity and Reliability Testing

A validity test measured whether an observed variable (indicator) is a measure or reflection of the related latent variable. The determiners of the validity test are the value of the Standardized Loading Factor (SLF) of each construct on the latent variable. A variable is valid if it reaches SLF 0.50. The reliability test measured the consistency of the measurement model of the latent variables. The determiners of the reliability test are the value of the Construct Reliability (CR) and Variance Extracted (AVE). A good measure of reliability has the construct reliability (CR) score ≥ 0.7 and variance extracted (AVE) ≥ 0.5 [43]. In this study, 41 indicators were valid and reliable, while two items (HR3 and EP5) were excluded from the analysis because they had SLF values <0.50 (Table 2).

Variabel	Frequency	(%)
Gender		
FemaleMale	168 51	76,7 23,3
Age		
21 – 30 years	42	19,2
31 – 40 years	127	58,0
41 – 50 years	42	19,2
>50 years	8	3,7
Work Unit		
Central (BPOM RI)	179	81,7
Area (Balai Besar/Balai/Loka POM)	40	18,3
Employment Status		
Government employees (Civil Servant)	182	83,1
	37	16,9

Table 2. The results of the validity and reliability test of the research variable measurement model

Construct	Item	SLF≥ 0,5	Error	CR≥0,7	VE≥0,5	Conclusion
HCHRP (ABILITY)	HR1	0,85	0,29	0,88	0,79	Valid and Reliabl
	HR2	0,93	0,14			
HCHRP (MOTIV)	HR4	0,69	0,52	0,84	0,58	Valid and Reliabl
	HR5	0,68	0,53			
	HR6	0,85	0,27			
	HR7	0,80	0,36			
HCHRP (OPPORT)	HR8	0,89	0,21	0,95	0,82	Valid and Reliabl
	HR9	0,91	0,17			
	HR10	0,92	0,15			
	HR11	0,90	0,18			
Affective Commitment	AC1	0,86	0,25	0,93	0,69	Valid and Reliabl
	AC2	0,91	0,16			
	AC3	0,82	0,32			
	AC4	0,92	0,16			
	AC5	0,78	0,39			
	AC6	0,65	0,58			
PSM (APS)	PSM1	0,61	0,62	0,88	0,65	Valid and Reliabl
	PSM2	0,75	0,43			
	PSM3	0,95	0,11			
	PSM4	0,87	0,25			
PSM (CPV)	PSM5	0,89	0,22	0,93	0,76	Valid and Reliabl
	PSM6	0,91	0,17			
	PSM7	0,85	0,28			
	PSM8	0,85	0,28			
PSM (COM)	PSM9	0,89	0,21	0,89	0,67	Valid and Reliabl
	PSM10	0,84	0,29			
	PSM11	0,79	0,38			
	PSM12	0,75	0,44			
PSM (SS)	PSM13	0,80	0,35	0,90	0,68	Valid and Reliabl
	PSM14	0,80	0,30			
	PSM15	0,87	0,24			
	PSM16	0,80	0,36			
Employee Performance	EP1	0,83	0,31	0,92	0,74	Valid and Reliabl
	EP2	0,86	0,27			
	EP3	0,92	0,15			
	EP4	0,83	0,31			
Innovative Behavior	IB1	0,91	0,18	0,95	0,79	Valid and Reliabl
	IB2	0,88	0,23			
	IB3	0,90	0,19			
	IB4	0,84	0,29			
	IB5	0,91	0,17			

Table 3. Goodness of Fit Index (GOFI) measurement model from research model

GOFI	Calculated value	Standard value for goodfit	Conclusion
RMSEA	0,051	RMSEA < 0,08	Good Fit
NNFI	0,94	NNFI > 0,90	Good Fit
IFI	0,95	IFI > 0,90	Good Fit
CFI	0,94	CFI > 0,90	Good Fit
RFI	0,85	RFI > 0,90	Marginal Fit
Standardized RMR	0,053	SRMR < 0,05	Marginal Fit
GFI	0,80	GFI > 0,90	Marginal Fit
Norm X^2	1,56	Norm $X^2 \leq 2.00$	Good Fit

Based on the LISREL 8.51 printout, Tabel 3. presented the Goodness of Fit Indices (GOFI) value of the measurement model from the research model. Based on Table 3, three GOFI values show a marginal fit, but the other GOFI values have a good fit. Thus, this analysis concluded that the measurement model of the research model as a whole has a good fit.

4.3. Structural Model of Research Model

This analysis relates to the test of research hypotheses. The research hypothesis is accepted if the absolute value of t (t-value) > 1.96 with the coefficient sign is by the proposed research hypothesis (positive or negative). The path diagram in Figure 2 (t-value) and figure 3 (standardized solution) shows the estimation results of the structural model of the research.

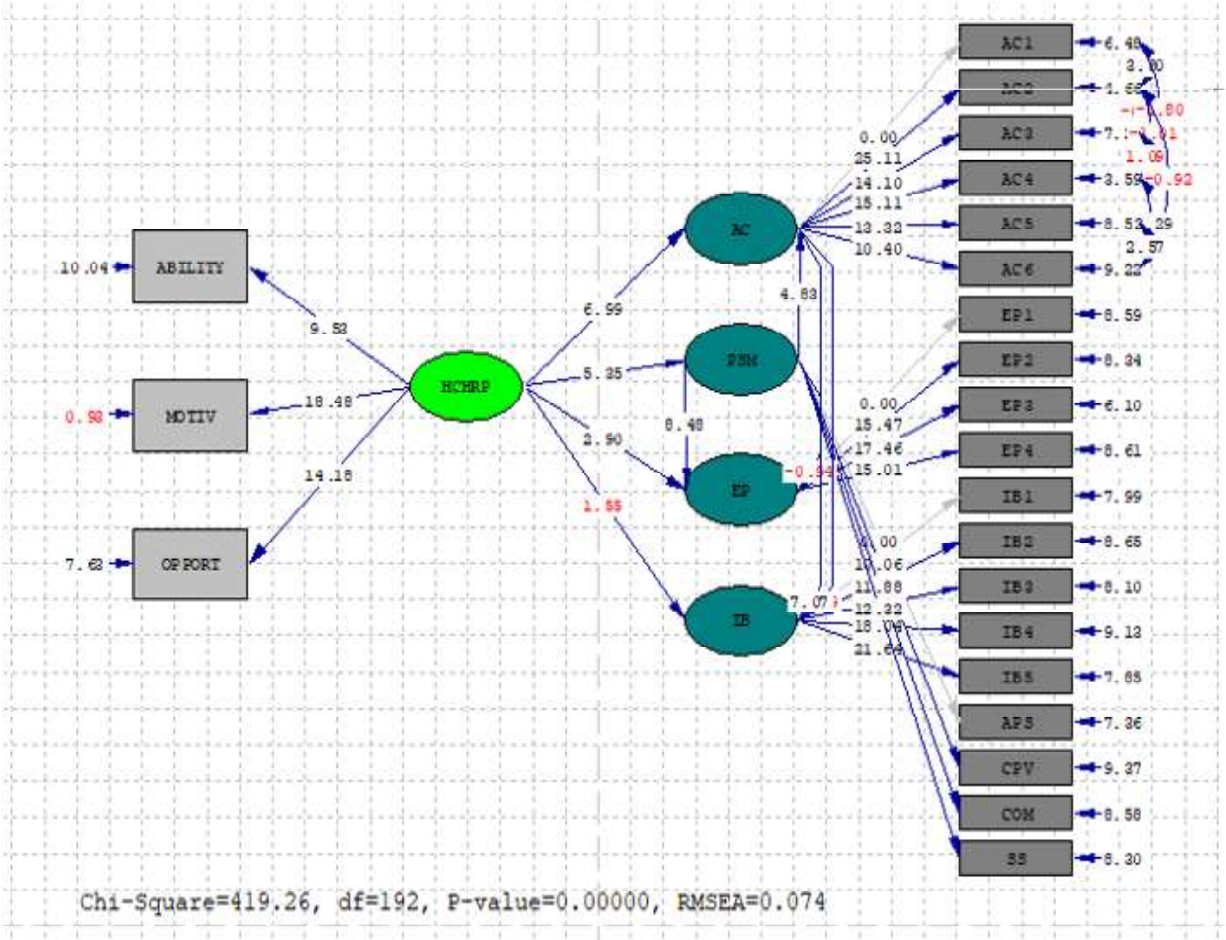

Figure 2 Path diagram of the research structural model (t-value)

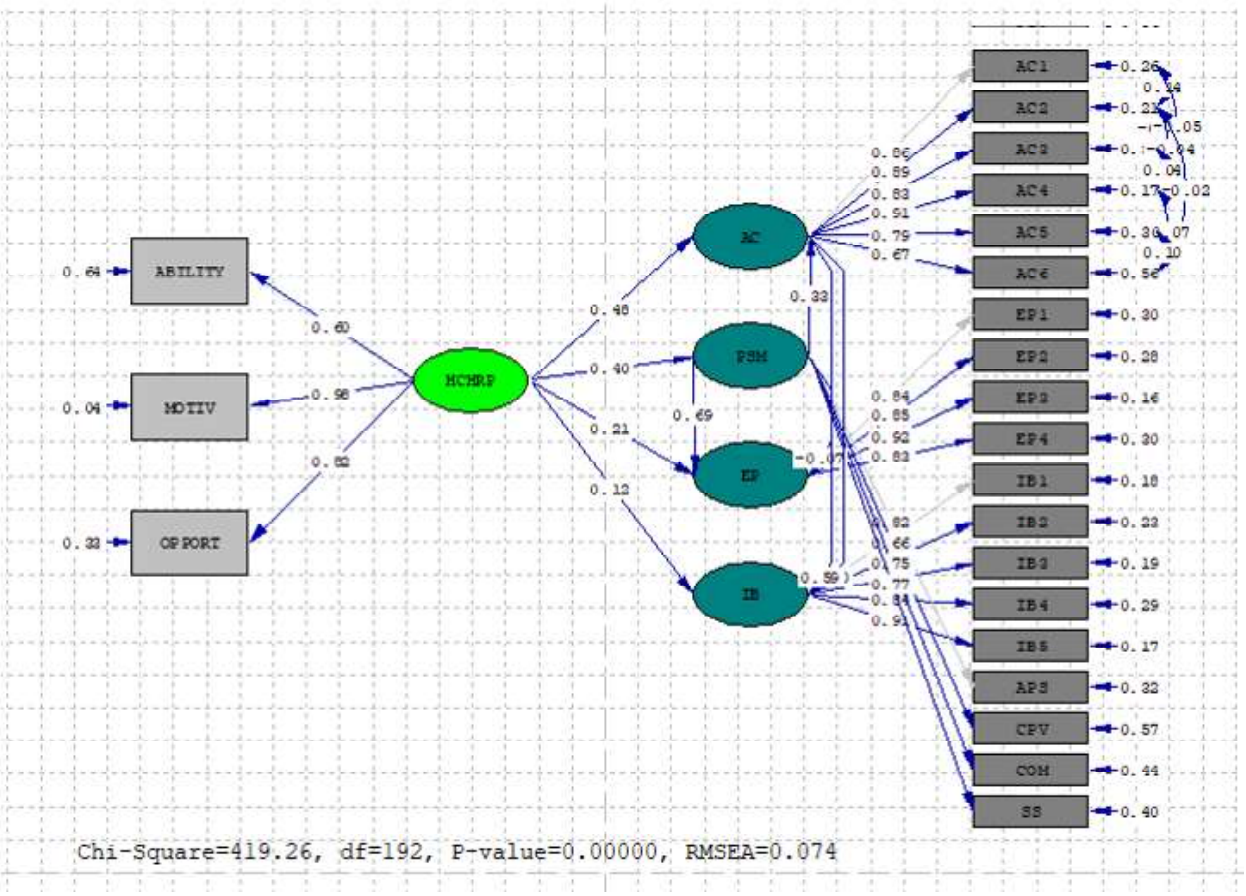

Figure 3 Path diagram of the research structural model (standardized solution)

Based on Table 4, three GOFI values show a marginal fit, but the other GOFI values have a good fit. Thus, this analysis concluded that the structural model of the research model as a whole has a good fit. Table 5 summarizes the statistical test of the relationship between latent variables shown in Figure 2 and Figure 3. The statistical test in Table 5 shows six significant relationships and three insignificant relationships.

Table 4. Goodness of Fit Index (GOFI) Structural Model of Research Model

GOFI	Calculated value	Standard value for good fit	Conclusion
RMSEA	0,074	RMSEA ≤0,08	Good Fit
NNFI	0,93	NNFI ≥0,90	Good Fit
IFI	0,94	IFI > 0,90	Good Fit
CFI	0,94	CFI > 0,90	Good Fit
RFI	0,88	RFI ≥ 0,90	Marginal Fit
Standardized RMR	0,068	SRMR ≤ 0,05	Marginal Fit
GFI	0,85	GFI ≥ 0,90	Marginal Fit
Norm X^2	2,18	Norm X^2 ≤ 3,00	Good Fit

Table5.StatisticalTest of Structural Research Model

Relationship between variables	*t-Value	Path coefficient	Conclusion
HCHRP→EP	2,90	0,21	Significant
HCHRP→AC	6,99	0,48	Significant
HCHRP→ PSM	5,35	0,40	Significant
HCHRP→IB	1,55	0,12	Not significant
AC →EP	-0,94	-0,07	Not significant
AC→IB	-1,09	-0,10	Not significant
PSM→AC	4,83	0,33	Significant
PSM→EP	8,48	0,69	Significant
PSM→IB	7,07	0,59	Significant

*t-value≥1,96 àSignificant

4.3. ConversionofPathDiagramsintoStructuralEquations

This path diagram conversion aims to determine theeffect of each construct based on mathematical values.Basedonthepathdiagramtest,themathematicalequationsformedare asfollows:

1) Equation1

AC = 0.33*PSM + 0.48*HCHRP, Errorvar.= 0.53, R^2 =0.47

Thisequationillustratesthat High Commitment HR Practices (HCHRP) together with Public Service Motivation (PSM) hasa 47% effecton Affective Commitment(AC), meaning that the other 53% are affected by the other factors outside of these variables.

2) Equation2

PSM=0.40*HCHRP,Errorvar.=0.84,R^2=0.16

ThisequationillustratesthatHighCommitmentHRPractices (HCHRP) have a 16% effect on Public ServiceMotivation(PSM),meaningthattheother84%areaffectedbytheotherfactorsoutsidethesevariables.

3) Equation3

EP =-0.073*AC+0.69*PSM+0.21*HCHRP,

Errorvar.=0.43,R^2=0.57

Thise quationillustratesthat High Commitment HR Practices (HCHRP) together with Public Service Motivation (PSM) and Affective Commitment (AC) influenceon Employee Performance (EP) of 57%, menaing the other 43% are affected by the other factorsoutsideofthesevariables.

4) Equation4

IB= - 0.095*AC + 0.59*PSM + 0.12*HCHRP,

Errorvar.=0.64,R^2=0.36

ThisequationillustratesthatHighCommitmentHRPractices (HCHRP) along with Affective Commitment(AC)havea36%effectonemployeeInnovativeBehavior (IB). While the other 64% are influenced byother factorsoutside thesevariables.

4.5 HypothesisTesting

Table 6 presents hypothesis testing to examine the effectof the independent variable on the dependent variablebased on the statistical tests in Table 5 and the researchhypotheses.Hypotheses testing in Table6shows sixresearch hypotheses are accepted, but three hypothesesarerejected.

Table6.Research HypothesisTest Results

Research Hypothesis	Significance	Conclusion
H1:PerceivedHighCommitmentHRPracticeshaveapositiveeffecton Employee Performance	Significant	H1 is accepted, the data support the model
H2:PerceivedHighCommitmentHRPracticeshaveapositiveeffecton AffectiveCommitment	Significant	H2isaccepted,thedatasupportthemodel
H3:PerceivedHighCommitmentHRPracticeshaveapositiveeffecton Public Service Motivation	Significant	H3isaccepted,thedatasupportthemodel
H4:PerceivedHighCommitmentHRPracticeshaveapositiveeffecton InnovativeBehavior	Not significant	H4isrejected,thedatadonotsupportthemodel
H5:AffectiveCommitmenthasapositiveeffectonEmployeePerformance	Not significant	H5 is rejected, the data do not support the model
H6:AffectiveCommitmenthasapositiveeffectonInnovativeBehavior	Not significant	H6 is rejected, the data do not support the model
H7:PublicServiceMotivationhasapositiveeffect on Affective Commitment	Significant	H7isaccepted,thedatasupportthemodel
H8:PublicServiceMotivationhasapositiveeffect on EmployePerformance	Significant	H8isaccepted,thedatasupport the model
H9:PublicServiceMotivationhasapositiveeffect on Innovative Behavior	Significant	H9isaccepted,thedata Support the model

4.5.1 PerceivedHighCommitmentHRPractice

ThetestingofHCHRPeffectonemployeeperformanceresultedinapositivepathcoefficientof0.21and t-value of 2.90 (greater than 1.96 with a significancelevel of 5%). Furthermore, the measurement of high-commitmentHRpracticeeffectonaffectivecommitmentand public service motivation obtained path coefficientvalues and t-values of 0.48 (6.99) and 0.40 (5.35). Thus,this means that the first three hypotheses stating the effectofhigh-commitment HR practices on employee performance, affective commitment, and PS Mareaccepted.

The positive relationship between HCHRP and employee performance is consistent with the research byMira, Choong, &Thim (2019). The positive relationship between HCHRPand affective commitmentisconsistent with the findings by Gould-Williams et al. (2014). The positive relationshipbetween HCHRP and PS Misconsistent with the research by Mostafa,Gould-Williams,and Bottomley(2015).

However, the relationship between HCHRPand innovative behavior shows adifferentfinding.This relationship has a path coefficientandt-valueof0.12 and 1.55 or below the 5% significance level. It means thathigh commitment HR practices do not affect innovativebehavior. So, the fourth hypothesis in this study is notaccepted. These results are partly consistentwith theresearchbyBos-NehlesandVeenendaal(2019)that revealed that perceptions of HR training and development practices were not significantly related toinnovativebehavior.

HR practices are actual, functioning, and observable activities experienced by employees. Anorganization may have many written policies regarding HRM, and top management may believe that they are perceived.

But all policies and beliefs are meaning lessuntil individual employees perceive them valuable to their well-being.An HR practice can be measured in three different ways:

by its presence,by its scope, orbyitsintensity [44].Most HR practices only relyonatten dancemeasures. It is easy to achieve and relatively easy to be analyzed, but cannotreflect its effectiveness. Meanwhile, the measurement that reflects coverage and intensity (for example, by asking employees if they have received sufficientt raining to do their job) are few. The quality of HRM implementation is a necessary condition for achieving its effectiveness[44].

In BPOM, innovation has become part of the bureaucraticre form agendas by developing aninnovation ecosystem and knowledge sharing through knowledge management. The organization facilitates innovation competition of public service to build aninnovation climate with criteria that innovation application can accelerate public services. The selected innovations willcompete in the national-level public service innovationcompetitionorganizedbytheMinistryofStateApparatusUtilization and Bureaucratic Reform (Kementerian PANRB). Thus, the innovation climate that BPOM wants to build with knowledge management and innovation competition shows that the organization is committed tofostering the spirit of innovation. However, the role ofHR practices needs to be enhanced further by expanding its scopeandintensity, so that it can befelt effectively by all employees.

4.5.2 Affectivecommitment

The measurement of affective commitment's effect on performance and innovative behavior resulted in path coefficients and t-values of -0.07 (-0.94) and -0.10 (-1.09),respectively.These relationships show that t-values are less than1.96. Its means that affective commitment does not affect employee performance or innovative behavior. Therefore, hypotheses 5 and 6 arenot accepted. In this regard, the researcher tries to find aview by citing Raineri's opinion (2017) about the effect of HR practices on performance mediated by the affective commitment and humancapital. Raineri(2017) revealsthatmultiplesets of HR practices do not necessarily impact performance through the set womediating channels. It helps support the AMO model'sargument that different HR practices play different roles in the relationship between HR practicesand performance.

In the context of BPOM, there may be a need forfurther analysis and exploration of the effect of affective commitment on employee outcomes, may be by considering workload or work-life balance, especially inthecurrentpandemicsituationandtheimpactofreorganization. Meyer et al. (2002) stated that employee affective commitment is an attitude response from work experience and beliefs about the work environment. Experiences and trusts related to the work environment, such as work-life balance, should positively influence employees' affective commitment to the organization, which, inturn, can improve theirper formanceandin-rolebehavior.

4.5.3 PublicServiceMotivation

The testing of PSM effect on affective commitment resulted in a positive path coefficient and t-value of 0.33and 4.83 (greater than 1.96). Furthermore, the testing of public service motivation effect on employee performance and innovative behavior obtained path coefficient and t-values of 0.69 (8.48) and 0.59 (7.07),respectively.Thus, it means that the last three hypotheses (hypotheses 7, 8, and 9) are accepted. These findings are consistent with the referred previous research(8,22,41,42). The previous finding showed

a positive relationship between HCHR Pand PSM (H3accepted).Therelationship between PSM with affective commitment, employeeperformance, and innovative behavioralsoshowed a positive relationship (H7, H8, and H9 wereaccepted). Thus, PSM mediated the positive relationshipbetween HCHRP and affective commitment, HCHRP and employee performance, and HCHRP with innovative behavior.

As individuals,employees are motivated not only by self-interest and material rewards but also by their experiences, emotions, values, and identities. Intrinsicmotivation is internalized factors that encourage better effort from an individual even without any real externalrewards or benefits that they derive. Due to the nature of public service, in trinsic and prosocial motivation plays asignificant role in improving the performance of public employees and even innovative behavior. Three in trinsic motivators are also character is tic of public service motivation can influence the performance of civil servants: first, when civil servants feel that their efforts are meaningful; second,when they are committed toprosocial activities and desire to serve the public; and third,when civil servants feel apleasant or positive emotional state (job satisfaction) by doing their job. Inaddition, social recognition and symbolic rewards for their efforts can also influence the performance of public employees by leveraging their intrinsic motivation [48]. The structural model formed with the tvalue is presented in Figure 4.

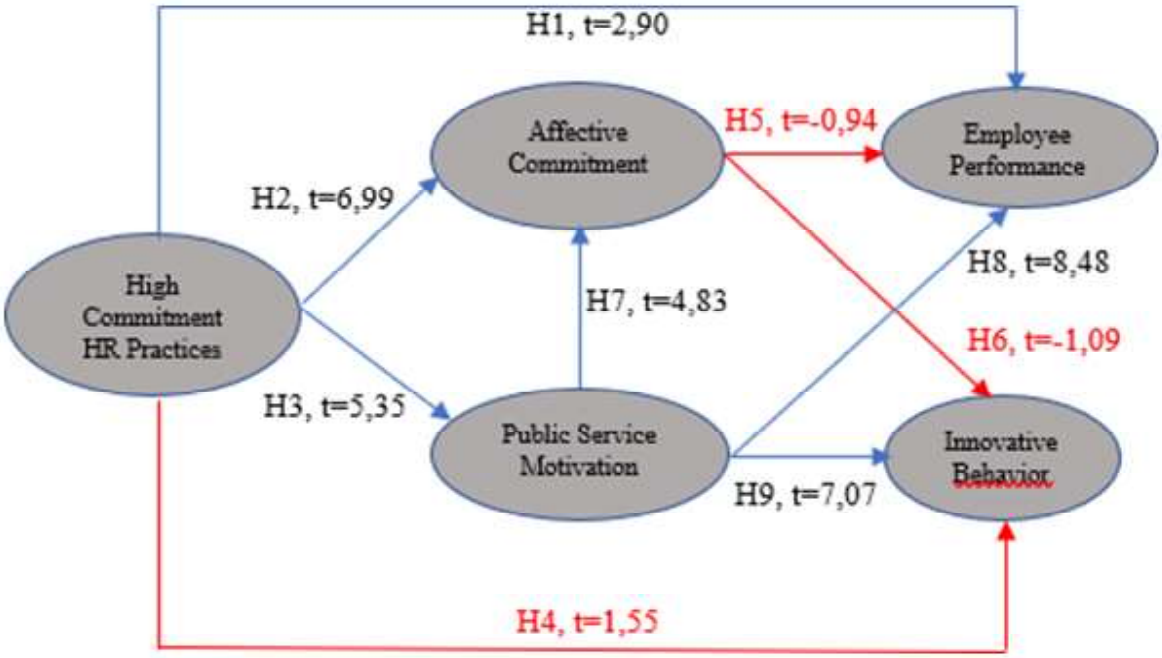

Figure 4 t-value of structural relationship between constructs

5. CONCLUSION AND IMPLICATION

5.1 Conclusion

This study concludes that high commitment HR practices are associated with increased affective commitment, public service motivation, and employee performance but do not affect innovative behavior directly. Other findings are positive relationship between public service motivation with affective commitment, performance, and innovation behavior of employees. It means that public service motivation mediated a positive relationship between high commitment HR practices with employees' affective commitment, performance, and innovativeness behavior. However, this study also reveals that employees' affective commitment does not affect performance and innovative behavior. Thus, in this study, affective commitment does not mediate the

relationship between high commitment HR practices with employee performance and innovation behavior. In other words, the findings of this study reveal that perceived high-commitment HR practices can influence affective commitment and employee performance both directly and through mediators of public service motivation. However, high-commitment HR practices affect innovative behavior indirectly through increasing employee public service motivation.

5.2 Theoretical implications

This research has several implications for theoretical developments in human resource management practices. This study found that high commitment HR practices did not directly influence employees' innovative behavior. According to social exchange theory, ideally, employees who feel highly committed to HR practices will need to reciprocate with something of value to the organization [45]. Organization needs to give signals to employees which behaviors are expected and rewarded. The sign in question can be (for example) creating an innovative climate that signals to employees that perceived HR practices can be rewarded with innovation behavior [27]. However, the results of this study suggest that ASN BPOM, perhaps, because of the lack of signals to demonstrate the value their superiors place on innovative behavior, seem to understand that they must reward high- commitment HR practices with productivity or efficiency.

In addition, the Job Demands-Resources theory [46] may also explain this problem. Individually perceived HR practices are considered a resource that employees can use in their work. Job demands were challenges to motivate employees to seek new ways of dealing with their work. Giving employees multiple job demands can help create innovation behavior opportunities because employees can apply innovative behaviors to cope with these job demands [47].

This study uses a theoretical approach to ability, motivation, and opportunity (AMO) in the form of high-commitment HR practices. According to AMO theory, organizations that want to improve performance develop HRM policies to shape positively discretionary behavior. As a result, employees need to understand how to compensate the organization. So, the organization should give the ability, encouragement, and opportunities to do so. Two assumptions underlie this theory. First, performance is the function of ability, motivation, and opportunity of employees to participate. Second, the practice of HR as a system respects the AMO factor that results in increased performance. Employees' ability can be encouraged by HR practices, such as training and development, recruitment, and selection. It means that employees have the skills and knowledge to perform better. Motivation (motivation) can be encouraged through appropriate compensation, career development, and sharing information and knowledge. Opportunity in this framework is focused on participation and can therefore be affected by autonomy, teamwork, and communication structures within the company [14].

5.3 Practical implications

Based on the mathematical calculations of structural equations, the results show that HCHRP together with PSM and affective commitment influence employee performance of 57%, meaning that the other 43% are affected by the other factors outside these variables (equation 3). Equation 4 shows that HCHRP together with PSM and affective commitment influence employee innovative behavior of 36%, meaning that the other 64% are affected by the other factors outside these variables.

The results suggested that managers should pursue HR practices that encourage employees' affective

commitment and public service motivation. Managers should decide which HR practices to invest in taking into account the types of outcomes expected from those practices, such as improved employee performance and innovative behavior. Organizations and line managers in must pay attention to how HR practices are interpreted by employees. By learning employees' perceptions of HR practices, managers and companies could intervene and ensure that the availability of these practices, purposes, and functions were understood by all group members.

6. LIMITATION AND SUGGESTION

This study has several limitations. First, the study design was cross-sectional, so the findings in this study may have many limitations. This study contributes to the theory by testing the correlation or influence between variables to conclude population groups but cannot provide information about a causal relationship in the population. It would be better to conduct a longitudinal study in which the influence measurement of high- commitment HR practices on employee performance and innovative behavior is conducted at different timescales. The second limitation of this study is the relatively small sample size. Thus, the findings may not be generalizable to other organizations. Third, in this study, the measurement of performance and innovative behavior is based on employees' perceptions. Thus, to improve research objectivity, further research could be better to carry out by measuring employees' performance and innovative behavior based on the superior's perception.

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Research on Innovation of Financial Management Model Based on Cloud Computing

4

Abstract: Against the background of the rapid development of big data and big data analysis technologies, cloud computing service providers provide services to enterprises and individuals. In many large enterprises, by setting up a cloud computing platform environment, multiple services within the enterprise are placed on the cloud platform to provide resource sharing services for various departments. With the dramatic improvement in computing performance of computer clusters, big data and cloud computing technologies are maturing. We combine cloud computing with financial management services, and use modern technical means to innovate financial management models; we will change the financial management model of enterprises by building financial sharing service centers, thereby providing more efficient financial management services. Based on the research of cloud computing technology, this paper expounds the application of cloud computing in financial sharing, and explores the transformation of financial management models in the context of cloud computing. Fully clarify the principles and procedures for the construction of financial sharing service centers based on cloud computing, and discuss the basic structure of financial cloud management. Finally, we discuss the operation model of financial management based on cloud computing to provide a reference for researchers in financial management.

1 Introduction

In the context of economic globalization, innovation is an important driving force for economic development, and taking the lead in innovation can be in an advantageous position in development. The development trend of world economic integration is becoming increasingly apparent, and the scale of enterprises is constantly growing, and many large enterprise groups have emerged. The transnational and cross-regional operations of enterprises have developed rapidly, and market competition has become increasingly fierce. With the increasing number of branches around the world, the internal management and control of enterprises have become more complicated. Financial management is the core and lifeblood of business operations. In order to adapt to new changes, the financial management model needs to be changed. The new financial management model needs to be able to strengthen the control of various subsidiaries and reduce costs through the standardization and standardization of business processes. The development of computer information technology and advances in cloud computing and big data-related technologies have made financial shared service centers widely used.

In the process of enterprise development, innovative financial management models are needed.

Comprehensive domestic and foreign financial management experience, centralized management of financial core business, divest non-core business, rectify and merge these businesses, and achieve resource sharing. The rapid development of computer information technology, the continuous improvement of the Internet platform, and the ability of cloud computing to process data at high speed have created basic conditions for financial sharing. In the new era, the construction of financial shared service centers has become one of the main ways for enterprises to respond to new challenges.

Multinational companies use Internet information technology to build financial shared service centers to solve problems such as corporate management and work efficiency. Financial sharing uses a new perspective to transform the original financial process using computer technology. Under the new service model, it sorts out and combines simple and repetitive financial tasks to unify management standards and realize financial information sharing.

2 Big data, cloud computing overview and financial cloud

2.1 Big data and cloud computing overview

Big data has obvious characteristics and is also called massive data. With the advancement of Internet technology, the Internet is widely used in various industries, and a large amount of data is generated every day. This data is continuously accumulated to form a big data environment. Cloud computing and big data are inseparable. Big data provides a data foundation for cloud computing, and cloud computing provides a good technical environment for big data. Big data and cloud computing related technologies are developed in concert to perform data analysis and provide data references for economic management. Cloud computing is a computing model that provides services through the Internet. Cloud computing is based on the Internet and virtual technologies. It provides users with virtualized resources and data. Depending on the resources provided by the cloud, it can be divided into IaaS, SaaS, PaaS and IIaaS. Users access and use cloud resources through the Internet, and only need to pay for the use of cloud resources. For the construction and maintenance of cloud resources, the internal deployment and structure of cloud resources need not be concerned. Utilize cloud computing and use distributed computing to obtain storage and computing capabilities, replacing local computers or remote servers.

Cloud computing integrates server clusters, highly reliable IDCs, and various applications. The system implements automated management to provide IT services to customers. The main characteristics of cloud computing include the following aspects: cloud computing has a resource sharing pool, the information system integrates, classifies, and outputs various resources, and outputs related information according to different instructions; Cloud computing performs self- data calculation without human operation; cloud computing outputs services to the outside in a unified manner, and users access the cloud as needed, and are divided into application services, infrastructure services, and platform services according to the required service level; The computing access function is extensive, allowing multiple terminals to access through standard mechanisms.

2.2 Financial management model based on cloud computing in the context of big data

In the context of big data, cloud computing technology realizes resource sharing through the Internet and virtual technologies. Centralizing all resources in the cloud storage center can provide powerful data processing and data storage services for enterprise users. Enterprise users only need to use simple terminal devices, purchase the service, and enjoy the storage resources and data processing functions provided by cloud computing services through the Internet. The enterprise's data information center will run on the Internet. Enterprise applications can flexibly switch computer resources according to different business access requirements and flexibly configure the enterprise. Information processing capabilities, greatly reducing information processing costs.

3 Construction of financial computing service center based on cloud computing

Internet technology is widely used in enterprises, and networking provides a technical foundation for companies to collect various types of big data. Based on the maturity of big data analysis technology, research and build and develop cloud computing financial shared service center services.

3.1 Finance cloud management structure

Finance cloud is the application of cloud computing technology in the financial sharing service center. In cloud computing, the client and the cloud are two important modules. The client is the port through which the user accesses and obtains information, providing users with accurate information. In the cloud, the structural layer is composed of four layers. The application layer continuously improves services such as guarantee management and fund management. The data management layer provides information support. The network service layer uses network storage, email, and web addresses to improve basic network services. The detailed structure diagram of Finance Cloud is as follows:

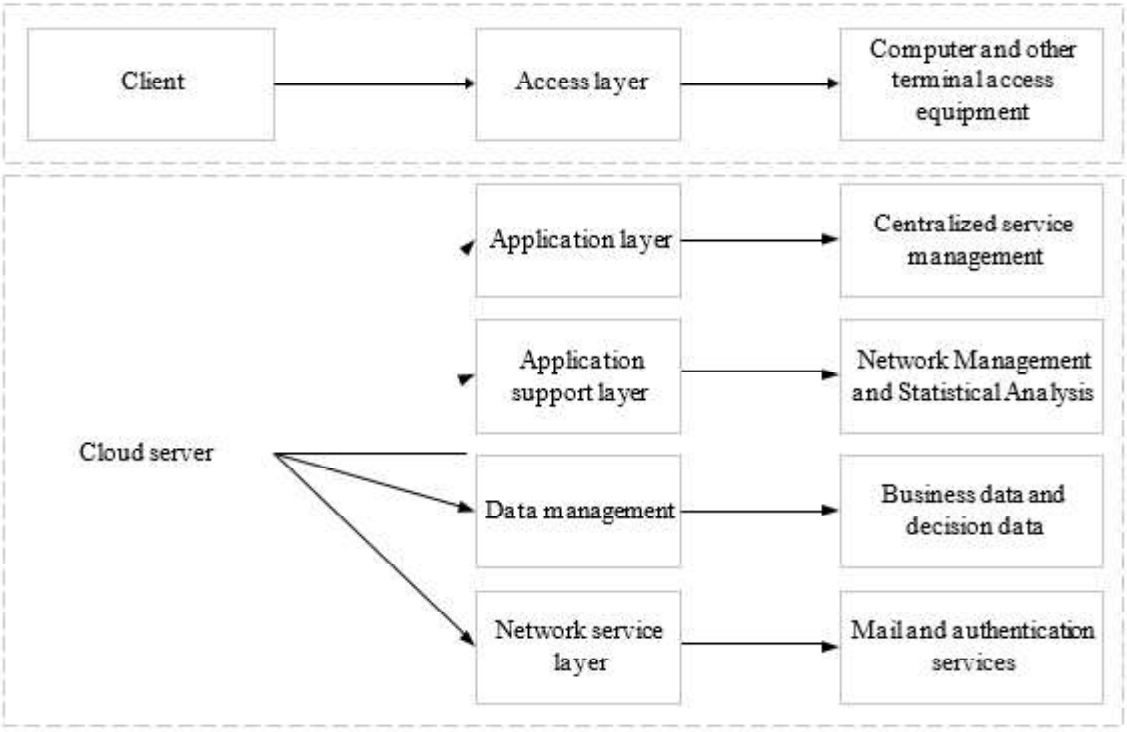


Figure 1. Detailed structure of the financial cloud

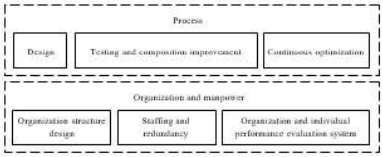
3.2 Model and Construction Strategy of Financial Shared Service Center Based on Cloud Computing

English units may be used as secondary units (in parentheses). The financial shared service center involves many departments and staffs, and to deal with many matters, it is necessary to make a design plan for the construction model in advance and formulate a construction strategy suitable for its own characteristics. The cloud computing-based financial shared service center construction model roughly includes processes, organization and human resources, information systems, and operations management.

Build strategy. The process of developing normative standards, including activities such as receiving input and generating output. Process design and reengineering include scheme planning and design, test improvement and process optimization; According to different strategic goals of cloud computing financial shared services, rationally arrange and organize organizational structure and staffing, and establish a

performance evaluation system; Build an information system; build an integrated operation and management system based on the value chain.

The construction model of corporate financial shared services is shown in Figure 2.



3.3 Optimization Design of Financial Information System Based on Cloud Computing

Determine the process design and operation model of the financial shared service center, and build a financial management architecture based on cloud computing. The cloud server includes an application layer, a data management layer, a network service layer, and an application support layer. Among them, the network service layer is responsible for providing network services: the application support layer provides technical support; the data management layer is responsible for data classification and storage; the application layer provides services such as financial accounting and fund management. The user accesses the financial information system through the client, obtains the required information, and interacts with the cloud for financial information operations.

The cloud computing-based financial shared service center mainly applies information system architecture in three aspects: operation management, accounting, management control and auxiliary accounting. Among them, the accounting remains unchanged, and the fund management system and expense reimbursement procedures are updated. In terms of system interface, it is important to build the relationship between personnel and finance, and realize the cost of human resources. The information system architecture of the financial shared service center is shown in Figure 3.

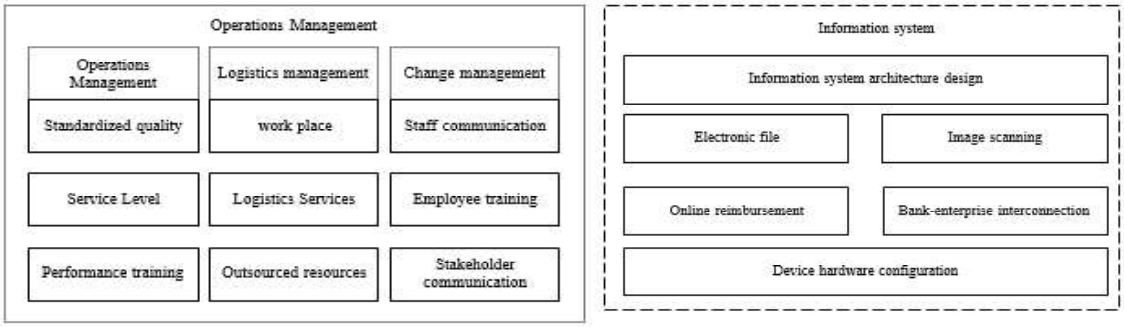


Figure 2. Enterprise cloud computing financial shared service construction model

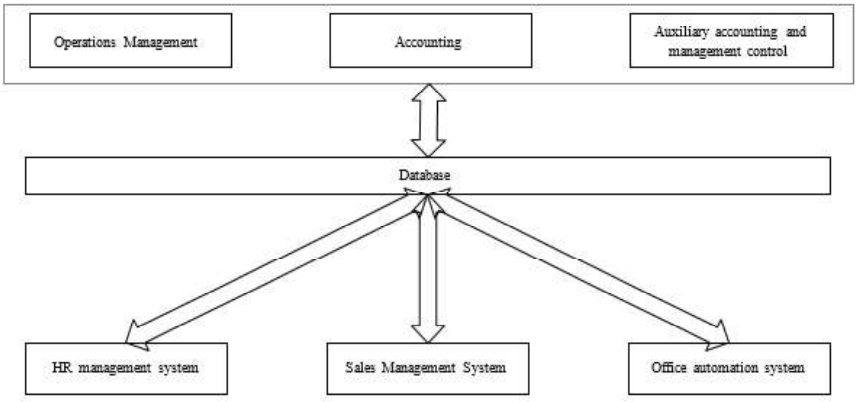


Figure 3. Cloud-based financial sharing center information system architecture

1.1 Apply cloud computing to enhance financial data integration and sharing

With powerful computing and storage capabilities, cloud computing can provide services in a timely manner according to user needs. Cloud computing is the foundation for building and enhancing financial sharing, IT storage capacity, data center facilities, security and software applications.

Cloud computing has powerful storage capabilities and data processing capabilities. Enterprises purchase cloud computing service storage and data processing technologies according to their actual conditions and needs. The more automated the financial information system is, the more financial cloud services can be provided to users. With the improvement of collaboration capabilities, human-driven services are transmitted to the cloud by establishing standardized interfaces. The location of the interface of the financial sharing service center is shown in Figure 4.

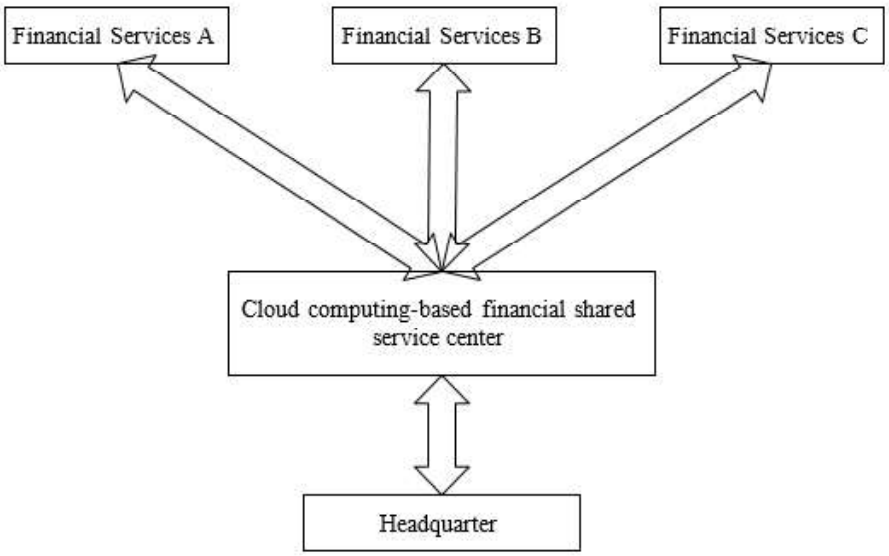


Figure 4. Interface bits of the financial shared service center

4. Operation process of financial management model based on cloud computing

According to the theory of cloud computing, relying on the management system, the collected business data is transmitted to the cloud, and the original files are decomposed according to the review requirements. Finally, vouchers and reports are automatically generated and output. The operation process mainly includes three parts: cloud collection, cloud processing and cloud products.

Cloud collection. In order to receive business data that reflects the actual occurrence of economic activity, transmitted to the cloud.

Cloud processing. Complete the classification, screening, storage and transfer of business data.

Cloud products. After cloud processing, the cloud platform covers a large number of element information, as well as traditional accounting vouchers. The output cloud products mainly include vouchers for the accounting of corporate fund receipts and payments, daily financial management vouchers and accounting statements; individual reports and consolidated statements; providing users with various financial indicators and data analysis. Figure 5 shows the overall operation process of a cloud-based financial shared service center.

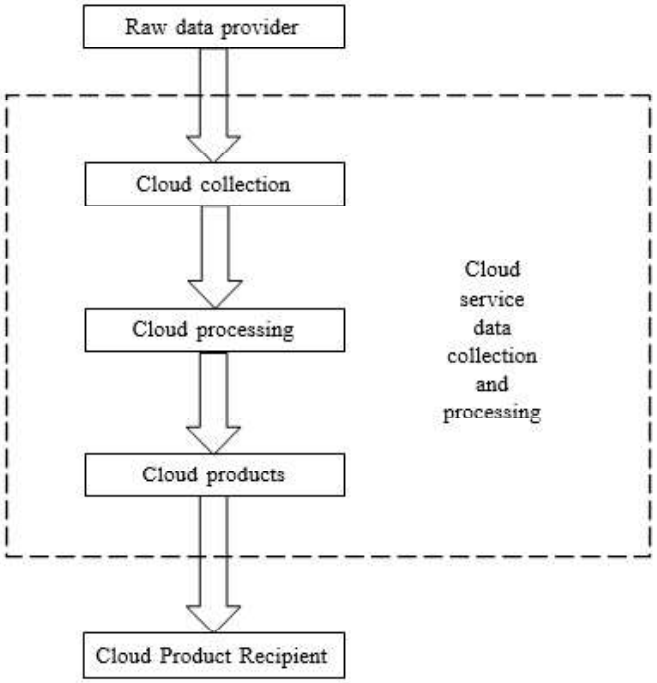


Figure 5. Cloud-based financial shared service center overall operation process

5. Conclusion

The use of cloud computing can promote the construction of financial shared service centers. With the development of computer information technology, cloud computing-based financial shared service centers can be perfectly combined with high technology. In the future, the financial shared service model will present a diversified, efficient and sustainable development trend. Based on cloud computing technology, it is an important task for modern enterprises to build an enterprise financial shared service center and study the financial management model that is suitable for the development of the times. Cloud computing technology is maturing and is widely used in various industries. Enterprises rent cloud services to reduce the basic investment in financial sharing; adopt cloud storage to reduce the cost of information storage; use cloud computing to improve the performance of information systems and make financial sharing service centers more powerful.

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Marketing Innovation

5

Chandrakant Mallick

Abstract: In the present scenario innovation plays a vital role in the industry to sustain in the market. If the companies fail to adopt the new concepts may be they will loss the customers or market share. To survive in the market they have to focus on what is desirable to the users, what is viable in the market place and what is possible with technology. Organizational generally follow external and internal impetus as a sources of innovation. Management guru Peter Drucker 1909 has identified four internal and three external impetuses for innovation. Internal prompts include unexpected occurrences, incongruities, process needs, and industry or market changes.

At the present scenario authenticity, net promoter scores, buzz tracking, From segmentation to insights, Green, Grey, Co-creation, Experimentational budgets, The return of the soap, More CGA prevails in the market. Mr. Gerber referred to this marketing methodology as the E-myth which was comprised of: innovation, quantification, orchestration, and documentation. The innovation has been implemented in many companies and they are running their business successfully. They are IBM, P&G, APPLE, Toyota Motors etc.

To conclude if you're trying to enhance your marketing program, or create one from scratch, keep this methodology in mind: innovation, quantification

I. Marketing Innovation

Introduction

The term **innovation** derives from the Latin word *innovatus*, which is the noun form of *innovare* "to renew or change," stemming from *in*-"into" + *novus*-"new". Although the term is broadly used, innovation generally refers to the creation of better or more effective products, processes, technologies, or ideas that affect markets, governments, and society. Innovation differs from invention or renovation in that innovation generally signifies a substantial change compared to entirely new or incremental changes.

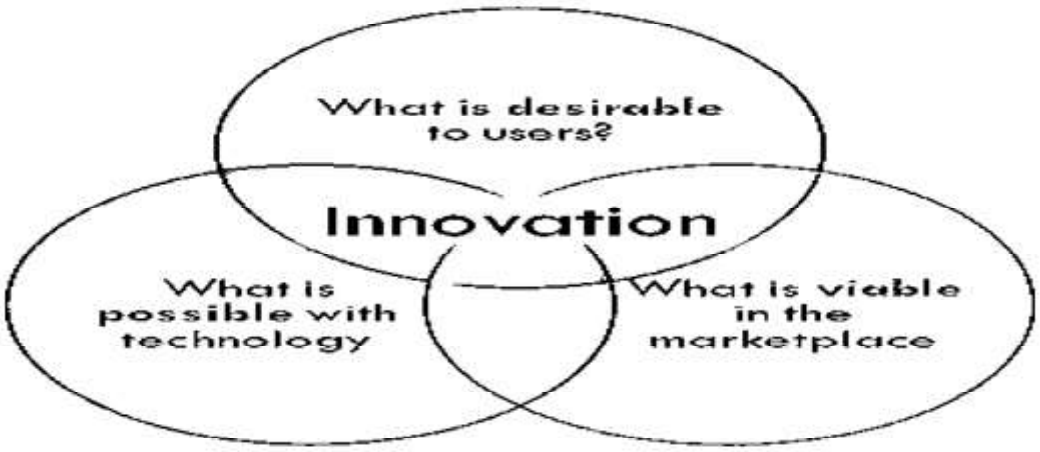
Marketing innovations are aimed at better addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales.

The distinguishing feature of a marketing innovation compared to other changes in a firm's marketing instruments is the implementation of a marketing method not previously used by the firm. It must be part of a new marketing concept or strategy that represents a significant departure from the firm's existing marketing methods. The new marketing method can either be developed by the innovating firm or adopted from other firms or organizations. New marketing methods can be implemented for both new and existing products.

Importance of Innovation

The definition and description of innovation, as the Literature review shown, clearly indicate that impact of innovate thinking in the marketing activities is considerably high. Innovation and creativity, the combination

of originality, divergent thinking and risk taking, is expected element used for creating guerrilla marketing campaigns. The necessity of applying innovate concepts in the marketing is supported by findings of the Primary research where 53% of the respondents stated that their companies´ marketing



Activities are interesting, eye-catching and differ from the campaigns of competitors. Moreover, 11% of the respondents describe their marketing activities as "unexpected, shocking and completely different than what people would expect".

The interest of respondents on innovation in their Internet marketing activities is expressed by 20 out of 28 respondents who positively answered that they would like to have some unexpected and interesting application on their website which would increase significantly the attention of the target audience. Therefore, as the research shows, use of innovation is necessary presumption for creating any guerrilla marketing campaign both offline and online

Innovation is the act of introducing something new or doing something in a different way. Innovation in business differs from creativity in that the latter is generally associated with the generation of new ideas. In contrast, innovation refers to taking those new ideas and actually implementing them in the marketplace. Thus, creativity is simply one element of the innovation process through which new ideas lead to new products, procedures, or services. Business scholars often attribute company success to innovation. Because of growing **international competition,** innovation became even more vital for companies toward the end of the 20th century.

Innovation usually results from trial-and-error experimentation and sometimes occurs incidentally where researchers produce something other than what they intended. Nevertheless, because of the growth of and accessibility to knowledge and information through the technology and information revolutions, researchers of the late 20th century generally could move from ideas to innovations much more quickly than their predecessors. A confluence of factors contributes to innovation in the business setting, including the research environment, market need, company strategy, and company resources.

II. History Of Innovation In Business

While innovation has existed as long as the species has, early innovations penetrated society and became established more slowly. For example, printing technology, various transportation innovations, and the use of gunpowder took centuries to reach most levels of society and become part of everyday life, according to Basil Blackwell and Samuel Eilon, authors of *The Global Challenge of Innovation.*

The penetration and acceptance of various innovations began to accelerate with the gradual collaboration and cooperation of science and assorted crafts and industries, especially in the 19th century. The partnership between science and industry allowed scientists to produce practical, reproducible technologies, which businesses could reasonably afford. Because of this collaboration, innovation grew quickly.

Despite the partnership, however, science and businesses still remained separate entities. Researchers worked either independently or as members of companies that specialized in developing, producing, and **marketing** innovations during this period. Consequently, many of these innovations failed to make it to the market.

Companies, however—especially power, chemical, and communications companies—began creating in-house **research and development** divisions early in the 20th century. In addition, they enhanced and marketed the innovations of others, breaking down the barrier between innovator and company. As a result, companies, not individuals, began controlling the **patents** to new inventions. Furthermore, teams of company researchers, not lone inventors, became the primary innovators.

III. Sources Of Innovation

Innovation is occasionally the result of a stroke of genius. More often, though, it occurs in response to a problem or opportunity that arises either inside or outside of an organization. Management guru Peter Drucker (1909) has identified four internal and three external impetuses for innovation. Internal prompts include unexpected occurrences, incongruities, process needs, and industry or market changes.

Internal Impetuses.

Unexpected occurrences include mishaps, such as a failed product introduction. It is often through such unexpected failures (or successes) that new ideas are born from new information brought to light. For instance, Ford's failed Edsel gave the company new information about marketing that allowed it to achieve stellar gains with succeeding products.

Incongruities result from a difference in a companies or industry's perception and reality. For example, although the demand for steel continued to grow between 1950 and 1970, profits in the steel industry fell. This incongruity caused some innovators to develop the steel minimill, a less expensive method of making steel that was also more conducive to changing market demands.

Innovations inspired by **process needs** are those created to support some other product or process. For example, advertising was introduced to make mass-produced newspapers possible. Newspaper publishers devised ads to cover the expense of printing the newspapers on the new equipment that made such printing possible.

Industry and market changes, the fourth internal impetus to innovate, often result in the rise (and decline) of successful innovators. For example, innovation and business savvy allowed International Business Machines Corp. (IBM) to effectively dominate the computer industry during the 1970s and early 1980s. It failed, however, to respond to a market switch during the 1980s from mainframes to smaller computer systems, particularly workstations and personal computer networks. As a result, IBM's share of the computer market plummeted and profits plunged as more innovative newcomers emerged.

External Impetuses.

External impetuses to innovate include demographic changes, shifts in perception, and new knowledge. ***Demographic changes*** *affect all aspects of business. For instance, an influx of Asian and Mexican immigrants into the United States has created new market niches for companies. Likewise, an increase in the level of education of Americans has resulted in a dearth of qualified workers for some low- paying jobs, causing many companies to develop new automation techniques.*

Changes in perception also open the door to innovation. For example, despite the fact that health care in the United States has continually gotten better and more accessible, people have become increasingly concerned about their health and the need for better and more accessible care. This change in perception has generated a huge market for health magazines, vitamin supplements, and exercise equipment.

Finally, one of the strongest external impetuses for innovation is **new knowledge, or technology**. When a new technology emerges, innovative companies can profit by exploiting it in new applications and markets. For example, the invention of Kevlar, a synthetic material, has spawned thousands of new product innovations, ranging from improved canoes and bulletproof vests to better tires and luggage.

IV. Innovation Strategies

Two types of strategies for innovation in business are internal and market-based approaches. Internal strategies include programs and initiatives implemented by companies to foster a creative and innovative environment, whereas market-based strategies—such as the leader, quick follow, and slow follow strategies—refer to different approaches to delivering innovations to the market.

· ***Internal Innovation Strategies.***

Internal strategies usually seek to develop and nurture the attributes of innovative corporations, such as prioritizing and encouraging innovation. Specific approaches to encouraging innovation differ by company and industry. For example, an integral aspect of Dow Corning Inc.'s strategy is to form "research partnerships" with its customers that solicit creative input from consumers and help the company benefit from new market opportunities. Other companies that employ customer-partnering programs include Black & Decker Corp. and General Electric.

One of the most innovative firms in the United States, 3M Company, sustains its creative environment by following a set of simple rules. By keeping its divisions small, division managers know the first names of all their subordinates, and, moreover, the company splits up divisions before their sales surpass $250 million to $300 million. It tolerates failure by promoting risk taking and experimentation. In fact, divisions must derive at least 25 percent of their profits from products developed during the past five years.

One of the most renowned strategies to generate innovation in organizations is the "Office of Innovation" model developed by Eastman Kodak Company in the late 1970s. It has since been implemented by several leading organizations, including Amoco Corp., Union Carbide, the U.S. Air Force, and Bell Canada. The Office of Innovation provides a mechanism for drawing people together to brainstorm on ideas that may not even be related to their departments or expertise. In fact, its chief benefit is that it promotes cross-fertilization and free-flow of ideas within a company.

Although implementation varies, the model prescribes the use of a decentralized network of individual offices located in different functional areas, such as marketing, finance, and production. Staff members are

encouraged to seek employees in other sectors who will come to the office and provide feedback on new ideas.

· ***Market-Based Strategies.***

Even companies with the most innovative organizational environments will languish if they fail to effectively market their innovations. For example, just because a firm improves its product doesn't mean that it should necessarily take the improvement to the market. From a strategic standpoint, the company could lose money if it has invested a lot of resources in marketing the original product because the improved version might cannibalize sales.

Although there are a number of product- and industry-specific strategies that companies may employ to promote their innovations, three of the most common market-based innovation strategies include the leader, quick follow, and slow follow (or no follow.

The **leadership strategy**, however, also may provide a variety of different benefits. For instance, companies often introduce an innovation to an existing product or service, calling it "new" or "improved," to breathe new life into it. Or they may bring out an improved product to discourage the competition from trying to steal market share, or to "leapfrog" their competitors. In the case of completely new products or ideas, a company may introduce the innovation in an effort to establish market dominance and attain leadership status.

The **quick-follow strategy** is often used by established competitors that already lead an industry or market niche. Rather than assume the risk inherent to the leadership strategy, the company will simply wait for one of its competitors to introduce an innovation. Shortly thereafter, the company will follow the leader with a substitute or improvement of the innovation. Quick followers are usually relatively sure of their ability to crush the competition with their established reputation and marketing and distribution channels.

A company that adopts a **slow- or no-follow strategy** may do so for a number of reasons. It may feel that existing competitive pressures or lackluster market growth make an investment in following an innovation unappealing. Or, the company may realize that it simply lacks the resources or technology necessary to compete with the new innovation. Some companies refuse to introduce or adopt an innovation because they fear that they will lose customers.

V. Trends In Marketing Innovation:

Authenticity:

Authenticity, honesty, 'realness' should have been at the top of this list for the past 10 years – but it seems as if it is actually breaking through now. Too many great examples of how companies enhanced their image and standing with either the general public or a relevant group of advocates have emanated recently – Scobleizer has probably generated billions worth of goodwill for Microsoft.

Net Promoter Scores

Sell your shares in market research agencies – their extensive research methods will go the way of the dinosaurs. Turns out, it all comes down to one question: "On a scale of 0 to 10, how likely are you to recommend brand/product X to someone else?" As the results of this research can be directly tied to revenue growth, instead of intangible (and not-boardroom safe) fuzzies like brand recognition, watch the corporate world being taken by storm by NPS, following the likes of GE and Philips.

Buzz tracking

'What's being said about me? Why is nobody talking about me? These are becoming core issues for every company. With the advent of ever better tracking tools for online conversations, it's becoming indispensable to listen into those conversations, be it to monitor bad things happening out there so you can jump in and call corporate 911, or to find out that nobody really cares about you (which is actually even worse).

From segmentation to insights

'Hey Cathy, I know you have a long distance relationship and are working only part-time to care for your newborn baby (which by the way has done it for your disposable income, for good), but I will still treat you the same as two years ago, when you were a job-starting, free-spending party animal. After all, you are still a 25-29 year old highly educated urban single female, aren't you?'

Green

It may be a cynical choice by many companies, but green awareness is the trend-du-jour. If even Wal-Mart is starting to promote eco-friendliness, where will it stop? As there is a lot of revenue waiting in this market – be it from selling eco-friendly goods at marked-up margins, or actually providing eco-technology, this one won't go away.

Grey

Marketers the world over are waking up to the fact that the older demographic is a major opportunity – and needs to be addressed in a different way then the 18-34 year olds. Mind you, different doesn't mean being patronizing and playing on old age. We're talking people who went to Woodstock and did all kinds of naughty things in their youth – don't talk to them as if they are senile.

Co-creation

The lazy developers dream – let your customers come up with your products for you. The power of harnessing your customers' insights is amazing. Once again you are connecting directly to the insights, wishes and beliefs of your customers, ensuring that you will hit a home-run with the rest of the world too.

Experimentational budgets

Following the leaders like Unilever, P&G and Heineken, marketers realize that they will have to set a portion of their marketing budgets aside for well structured experiments. Developments in the digital domain are so fast and furious it's not always possible to wait for full understanding. By experimenting in a controlled way companies can get insights at very attractive cost – and sometimes even strike gold.

The Return of the Soap

As the consumer's aversion to traditional 30" spots is starting to hurt, TV channels and advertisers alike have to look for different models. Product placement and branded entertainment are starting to take up a serious position in their portfolios. A major advantage is that the convergence of TV and online is almost built into this model, as there are far less objections to the re-distribution of branded content throughout the internet then with traditional advertising-funded models.

More CGA

Not only developers have their lazy-dream, marketers too: Consumer Generated Advertising. Let your customers not only be your Promoters, but actually make your advertising for you. As this advertising will

always be based on what they REALLY love about you, it's sure to strike home with other consumers.

Marketing Innovation: How To Improve Marketing Roi

There are a number of basic marketing fundamentals that everyone needs to know in order to generate attention, interest, desire and action among prospects. But to be successful in today's competitive environment, you need more than a basic understanding of a traditional AIDA model and the 4 P's (product, place, price, promotion).

A number of years ago, I discovered a marketing methodology made popular by Michael Gerber. For those of you who have never heard of him, you can still find his books on Amazon or your local bookstore. Mr. Gerber referred to this marketing methodology as the E-myth which was comprised of: innovation, quantification, orchestration, and documentation.

This methodology is the key behind major marketing successes like McDonalds, the Four Seasons, and many other well-known brands. Let me explain his methodology and illustrate how it can be applied to your business to deliver significant ROI.

Innovation if you do what everyone else is doing, you'll get the same results – if you're lucky. Most often, those who excel in any market are the innovators, those who are continually trying new things, creating new methods of doing business, or standing for something unique.

The example of innovation in a sales/marketing sense gives you the ability to try something new. This 'something' can take a variety of different formats, but most importantly it is something that can move you towards a greater ROI. Especially if you understand the next step which is quantification.

Quantification with each innovation, an action is taken – a product sampled, research conducted, a new sales pitch or value proposition delivered. To be truly effective with your marketing you must measure your results.

The most successful marketing programs are always working to improve their return on investment (ROI). The key is to measure each independent element that could possibly influence your result. Using our example of the retail establishment, you wouldn't want to ask all of your sales reps to start using a new pitch and change their dress code. Doing so might dilute your ability to measure the effectiveness of a new sales script. Additionally, you wouldn't want to change other store elements like the music or store layout at the same time – doing so would make accurate measurement next to impossible.

Orchestration after trying something innovative, and measuring the result, you now know what works and what doesn't. The key is to keep innovating in small ways, continually testing and evaluating the results. Once you have your successes identified, you need to roll them out in a systemic fashion.

All sales and marketing personnel should be utilizing and implementing the latest innovation in all they do. This methodology now becomes your control. Your next innovation is only effective if it produces better results than your control.

Improving your process of orchestration is also extremely important. The faster you implement your innovation across the business – in a consistent fashion, the better your results become. Wal-Mart is a master of this. If there is an innovation in one store, it is quickly shared and implemented with all store managers across the U.S. The result is innovation on a massive scale which has a direct and positive influence on ROI.

Documentation The top innovators do this last step extremely well. Documentation doesn't mean creating reams of manuals that are esoteric or difficult to navigate. Rather, documentation is the development of a guide, procedure, or system that allows consistent implementation of the innovations you develop.

As new personnel come into your business, you want to make sure that the innovations and enhancements you've made to your sales and marketing practices are fully implemented. The best way to do this is to not expect an employee to memorize a 700 page employee instruction manual. Rather, they should become familiar with your way of doing business - which needs to be documented in a simple, easily understandable format.

Innovative Companies:

Seven of the top 10 innovators were not among the top 10 spenders on innovation. Many of those identified by their peers as top innovators actually spent well below their industry averages on R&D, as a percentage of sales. And, most important, the top 10 innovators turned in better financial performances than the top 10 spenders. The top 10 innovators listed below:

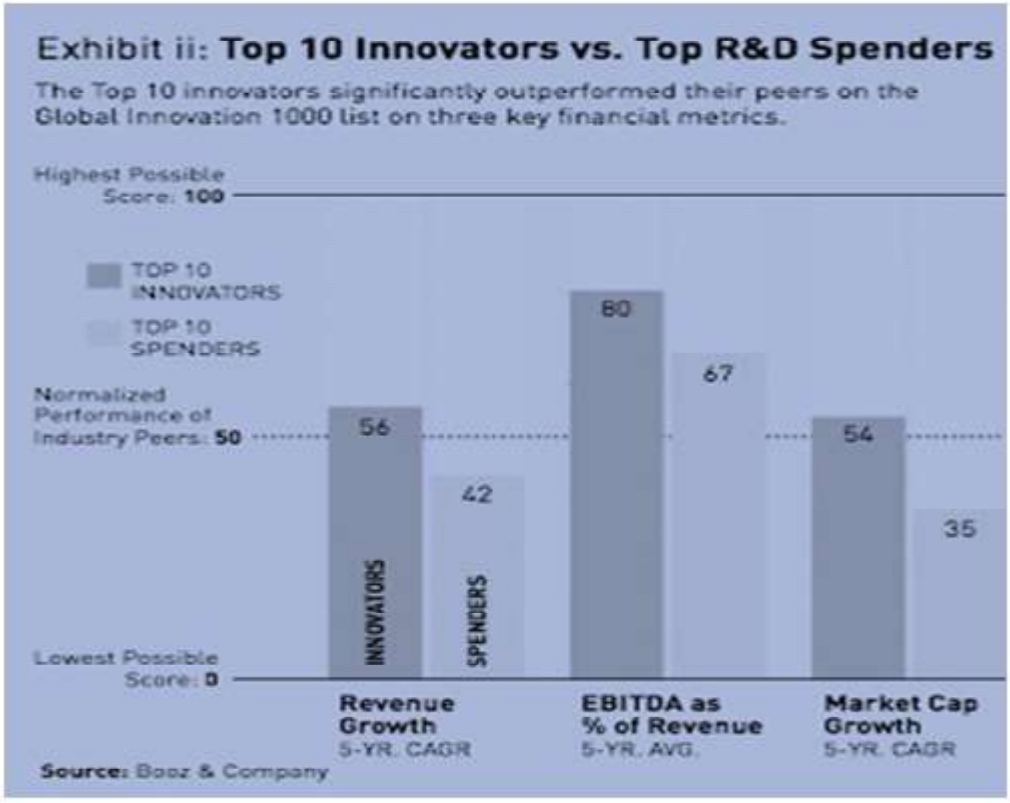
- **Apple** (AAPL - news - people),
- **Google** (GOOG - news - people),
- **3M** (MMM - news - people),
- GE,
- **Toyota** (TM - news - people),
- **Microsoft** (MSFT - news - people),
- **P&G** (PG - news - people),
- **IBM** (IBM - news - people),
- Samsung and
- **Intel** (INTC - news - people)

Exhibit i: Top 10 Most Innovative Companies

Innovation executives we surveyed votes overwhelmingly for Apple, Google, and 3M as the most innovative companies. Votes for the next seven were much more modest.

		R&D Spending 2009 $US mil.	Rank	Sales 2009 $US mil.	Intensity (Spending as % of sales)
1	Apple	$1,333	81	$42,905	3.1%
2	Google	$2,843	44	$23,651	12.0%
3	3M	$1,293	84	$23,123	5.6%
4	GE	$3,300	35	$155,777	2.1%
5	Toyota	$7,822	4	$204,363	3.8%
6	Microsoft	$9,010	2	$58,437	15.4%
7	P&G	$2,044	58	$79,029	2.6%
8	IBM	$5,820	12	$95,759	6.1%
9	Samsung	$6,002	10	$109,541	5.5%
10	Intel	$5,653	13	$35,127	16.1%

Source: Booz & Company



The "table-stakes" set of innovation capabilities: the ideation stage, an ability to gain insight into customer needs and an understanding of the potential relevance of emerging technologies. At the product development stage, an ability to engage actively with customers to prove the validity of concepts and to assess market potential and risks, and the ability to leverage existing product platforms into new products. At the commercialization stage, an ability to work with pilot users to roll out products carefully but quickly, and to coordinate across the entire organization for an effective launch. But even more important, the best performing companies develop additional capabilities that are very specific to their chosen innovation strategies.

The most successful companies, we found, are those that focus on a particular, specifically aligned set of common and distinct capabilities that enable them to better execute their chosen strategies.

VI. Conclusion

For those companies that are struggling with their innovation efforts concludes by suggesting three key things they should consider doing right away:

- Diagnose their innovation efforts: take a step back and see where innovation efforts are strong and weak.
- Research five similar-sized firms: go completely outside of the industry and look for successful innovators that are the same size as their organization. What are they doing successfully that can be adopted.
- Get a meeting with those that matter: begin talking about "strategy" and "process" with the relevant people in the organization. The conversation about the important things in innovation can start from anywhere, but ownership must finally come from the top.

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Organizational and human resource management and innovation: Which management practices are linked to product and/or process innovation?

Dr. Amitabh Nanda

Abstract: We examine the determinants of ûrms' innovation success, using the ûrm-level data from the Japanese National Innovation Survey. We focus on the relationship between organizational and human resource management practices for research and development (R & D) and product/process innovation. We ûnd that interdivisional

cooperation/teams and the creation/relocation/integration of R & D centers are positively associated with both product and process innovation. Having board members with an R & D background is positively associated with product innovation, implying that top-down R & D decision-making may be important for ûrms to introduce new products. Among the factors examined, personnel assessment reûecting R & D outcomes appears to have an especially strong relationship with product innovation. Moreover, the positive relationship between the crea- tion/relocation/integration of R & D centers and innovation success suggests that drastic organizational changes can work as a clear signal of ûrms' determination to pursue an innovation-oriented strategy and help to accelerate innovation success.

1. Introduction

Innovation has long been recognized as the most important source of economic development and ûrms' growth (Schumpeter, 1934; Penrose, 1959). Consequently, how to boost innovation has been of central interest to both policy makers and entrepreneurs.

In the academic ûeld, market competition is considered to be an important determinant of ûrms' incentive to innovate, and research examining the relationship between competition and innovation both from a theoretical and an empirical perspective spans back more than half a century (e.g., Arrow, 1962; Gilbert and Newbery, 1982; Cohen and Levin, 1989; Aghion et al., 2005; Vives, 2008). However, the de- gree of competition among ûrms in a particular product market is not necessarily the main or key factor determining the probability of in- novation success.

Teece (1996), for instance, argues that an important determinant of innovation is ûrm organization and that scholars need to understand the importance not only of market structure and the business en- vironment but also of the formal and informal structures of ûrm orga- nization. There is some quantitative evidence indicating that such or- ganizational aspects indeed are important determinants of innovation inputs and output. For example, estimating patent production functions, Pakes and Griliches (1984) found that the magnitude of the coeûcient on research and development (R & D) investment fell dras- tically when ûrm-speciûc eûects are controlled for. Meanwhile, Scott (1984) found that ûrm ûxed eûects explained about 50% of the var- iance in R & D intensity. These results imply that there are unobserved ûrm-speciûc factors which greatly aûect innovation activities. One possible explanation of the results is that ûrm-speciûc organizational practices play a role in determining ûrms' innovation output and inputs.

Against this background, the literature has increasingly focused on various features of organizations, including

(1) the design of incentive systems; (2) ûrms' ability to manage spillovers of knowledge; and (3) ûrms' choice of organizational structure. However, although there is a burgeoning literature on organizational and human resource manage- ment issues (for a survey, see, e.g., Bloom and Van Reenen (2011), Laursen and Foss (2014), and Seeck and Diehl (2017)), most studies do not focus on management practices for R & D units or R & D personnel. Instead, they investigate, for example, the relationship between in- novation and ûrm-wide management practices such as the role of teams, payment schemes, and training for workers overall, without speciûcally focusing on management practices with regard to re- searchers and/or research units.

Yet, as pointed out by Azoulay and Lerner (2013), most of our knowledge on this relationship does not stem from the mining of tra- ditional datasets such as large sample survey datasets or census-type datasets, but from small-sample surveys and case studies. Moreover, previous empirical studies using ûrm-level innovation survey data or patent-inventor linked data, as we will detail in the next section, have not yet provided conclusive evidence on the relationship between R & D human resource management and R & D outcomes.

This means that there are still very few empirical examinations of organizational management and R & D activities based on large-scale ûrm-level databases.[1] Moreover, as the literature surveys by Laursen and Foss (2014) and Seeck and Diehl (2017) highlight, the possible diûerential roles of management practices depending on the phase of the innovation process or the type of innovation, i.e., product or process innovation, have not yet been suûciently investigated in previous empirical research.

Therefore, the aim of the present study is to empirically examine the relationship between ûrms' R & D-related organizational and human resource management on the one hand and innovation output on the other hand. For the analysis, we use the ûrm-level data underlying the

Japanese National Innovation Survey conducted by the Ministry of Education, Culture, Sports, Science and Technology in 2009. This survey is the Japanese equivalent of the Community Innovation Surveys (CIS) conducted by the European Union. Using the data enables us to deûne two diûerent types of ûrm-level innovation output: product in- novation, which is deûned as the successful introduction of new products or sales from innovative products; and process innovation, which is deûned as the successful introduction of new or signiûcantly im- proved production processes. The data also enable us to take the technological superiority of product innovations (breakthrough in- novation) into account by using information on the time required by rivals to catch up. Moreover, using the data, we can obtain ûrm-level information on within-ûrm R & D organizational changes as well as on assessment schemes for researchers. The novelty of our study is that it examines the link between the management of researchers or research units and ûrm-level innovation using ûrm-level information on in- novative products/processes. Moreover, we examine whether there is a diûerence in the link between management practices and innovation depending on the type of innovation. We explicitly investigate what kinds of management practices are positively associated with product or process innovation and breakthrough product innovation.

Our ûndings suggest that implementing more than one management practice at the same time is associated with a higher probability of innovating new products. Particularly for product innovation, man- agement practices such as interdivisional cooperation, board members with an R & D background, personnel assessment reûecting R & D out- comes, and restructuring of R & D centers have a strong and positive

link with innovation success. Among these practices, personnel assess- ment appears to have an especially strong relationship with product innovation. However, in the case of process innovation, human re- source management practices are less likely to be signiûcantly posi- tively linked with innovation success. Meanwhile, the importance of board members with an R & D background and the restructuring of R & D centers suggests that top-down R & D decision making and drastic organizational changes can serve as a deûnitive signal of ûrms' intent to pursue an innovation-oriented strategy and can accelerate innovation success.

The remainder of this study is organized as follows. Section 2 pro- vides a survey of the related literature and highlights the importance of organizational factors as determinants of innovation success. Based on the literature review, we present our hypotheses on the link between various management practices and success in product/process innova- tion. Section 3 describes the dataset used in this study and discusses various characteristics of the innovation management practices of Ja- panese ûrms. Section 4 then examines complementarities between or- ganizational and human resource management practices. Next, Section 5 explores eûective management practices in more detail and in- vestigates practices particularly eûective for breakthrough innovation. Finally, Section 6 concludes.

2. Related literature

Teece (1996) argues that the formal and informal structures of a ûrm have an important bearing on the strength of innovation activity. He highlights seven key properties of technological innovation. Speci- ûcally, innovation tends to be characterized by uncertainty, path de- pendency, and technological interrelatedness, it tends to be cumulative in nature and exhibit irreversibilities, knowledge is often tacit, and innovations can be diûcult to appropriate. Given these underlying properties of technological innovation, he identiûes the organizational requirements for innovation success: (1) joint research projects or al- liances with other ûrms to obtain better access to capital; (2) co- operation and coordination across business units or divisions to miti- gate various types of uncertainties; (3) horizontal and/or vertical integration of organizational subunits such as R & D, manufacturing, and marketing, in order to attain economies of scope and successfully commercialize innovations; and (4) human resource management practices to develop corporate norms and instill them in employees.

Based on Teece's (1996) discussion, this study – mainly reûecting data availability – focuses on the following three broad types of man- agement practices: (1) cooperation and coordination across business units or divisions at the ûrm as a whole; (2) human resource manage- ment with regard to R & D personnel; and (3) restructuring the orga- nization of R & D. The remainder of this section reviews ûndings of previous empirical studies related to these types of management prac- tices.[2]

2.1. Cooperation and coordination across business units or divisions

First, cooperation and coordination across business units or divi- sions is expected to increase knowledge spillovers within a ûrm and to improve ûrm performance. As argued by Shipton et al. (2005), for ex- ample, transfer of knowledge within an organization is one important stage of the organizational learning cycle through which innovation is promoted. Jones (2009), for example, using a large micro dataset of inventors and focusing on organizational management practices, shows that teamwork becomes more important over time. However, the im- pact of teamwork may diûer depending on team members' cognitive

style, i.e., whether the team contains members that are creative, con- formist, and/or attentive to detail, etc. Miron-Spektor et al. (2011) ûnd that creative team members are essential for team radical innovation, while attentive-to-detail members had a negative inûuence on team radical innovation.

2.2. Human resource management

As for human resource management, a topic that has received considerably more attention is the role of incentive systems such as pay for performance. Studies on pay for performance have produced mixed results, however. While some show that compensation based on the pay-for-performance principle induces higher levels of eûort and pro- ductivity (e.g., Lazear, 2000; Shearer, 2004), other studies highlight the distortions associated with incentive pay schemes (e.g., Bloom and Van[2] For a discussion of the importance of managing the organizational context when managing innovation, see Phillips (2014).

Reenen, 2011). Meanwhile, using a large micro dataset on inventors, Nagaoka et al. (2014) examine the relationship between revenue-based payments for inventions and research outcomes (proxied by the number of patent citations). They ûnd that although incentive pay schemes tend to increase the number of patent citations (i.e., result in higher-quality

inventions), the eûect depends on the degree of inventors' intrinsic motivation for science. Intrinsic motivation is based on researchers' enthusiasm for exploration and means that researchers work on some-

thing because they ûnd it personally rewarding. On the other hand, monetary incentives provide only extrinsic incentives, and Nagaoka et al. (2014) ûnd that for inventors with greater intrinsic motivation incentive pay schemes have a smaller positive eûect. This result is consistent with ûndings by Stern (2004), who, using a dataset on job oûers for postdoctoral biologists, observes a negative relationship be- tween intrinsic and extrinsic incentives.

Studies such as Lerner and Wulf (2007), Yanadori and Cui (2013), and Kanama and Nishikawa (2017) statistically examine the relationship be- tween remuneration schemes and innovation. Lerner and Wulf (2007) analyze the relationship between compensation of senior executives and R&D outcomes and ûnd that more long-term incentives such as stock op- tions are associated with more heavily cited patents. However, Yanadori and Cui (2013), focusing on the compensation of R & D employees, ûnd that pay dispersion among R & D employees is negatively associated with ûrm innovation (proxied by the number of successful patent applications), which implies that large pay diûerentials among employees decrease collaboration and preclude innovation. Kanama and Nishikawa (2017), using the same dataset as that employed in our study, also ûnd that monetary compensa- tion does not have a positive impact on innovation, while the introduction of an assessment system based on R & D performance does. Also of interest in this context is the study by Ederer and Manso (2013), who, using a la- boratory experiment, provide evidence that the combination of tolerance for early failure and reward for long-term success is eûective in motivating innovation, suggesting that incentive schemes should be designed from a long-term perspective.

Another aspect that is potentially important is the role of leadership.

However, although this aspect has been noted by scholars, there is very little research on the link between leadership and innovation (Oke et al., 2009). Exceptions include studies such as Jung et al. (2003) and Mokhber et al. (2017), which explore the connection between innova- tion and transformational leadership. Transformational leadership fo- cuses on longer-term and vision-based motivational processes (Bass,

1990). The studies by Jung et al. (2003) and Mokhber et al. (2017) indicate that transformational leader have a positive impact on orga- nizational creativity. Jung et al. (2003) show that transformational leadership by top managers likely creates an organizational culture in which employees are encouraged to freely discuss and try out in- novative ideas and approaches.

As for employee diversity, previous studies such as Van der Vegt and

Janssen (2003) suggest that employee diversity is positively associated with innovation performance, since innovation is an interactive process where employees interact in groups and develop, discuss, modify, and realize new ideas. However, Østergaard et al. (2011) observe that age diversity has a negative eûect on product innovation but ûnd a positive relationship between employee diversity in gender and education on the one hand and product innovation on the other. These ûndings suggest that diûerences in perspectives on a wide range of issues be- tween young and old may create disagreement, lowering innovation performance.

2.3. Restructuring the organization of R & D

Turning to R & D organization structures, several studies investigate whether the choice of a centralized or decentralized R & D structure aûects R & D outcomes (e.g., Argyres and Silverman, 2004). von Zedtwitz et al. (2014) ûnd that R & D organization, or how ûrms structure their R & D department, is one of the central components to a ûrm's approach to managing new product development. Lerner and Wulf (2007) found that more long-term incentives are clearly asso- ciated with innovation in ûrms with centralized R & D organizations while no association in ûrms with decentralized R & D organizations is found. These studies suggest that ûrms with a centralized R & D orga- nization tend to generate more frequently cited patents.

Another aspect that one might expect to promote innovation, par- ticularly product innovation, is increased authority for researchers to provide intrinsic motivation to researchers to produce creative ideas (see, e.g., Jung and Sosik, 2002). However, Jung et al. (2003) suggest that the eûect of empowering researchers to innovate depends on the strength of employees' "perceived" empowerment; i.e., such authority must give researchers a sense that they are in control.

2.4. Product or process innovation

So far, we have focused on the ûndings of previous studies on product innovation and management practices. However, it is possible that the de- terminants of innovation diûer between product and process innovation, as suggested by Rouvinen (2002) among others, implying that eûective man- agement practices are also likely to diûer between the two types of in- novation. Shipton et al. (2005), for example, ûnd that appraisal systems closely linked to remuneration have a tendency to negatively aûect in- novation, and that this is particularly so in the case of process innovation. Incremental or process innovation are often associated with learning-by- using or learning-by-doing that accompany the introduction of new ma- chinery, meaning that it is probably more diûcult to identify who con- tributes to successful innovation in the case of incremental or process in- novation than in the case of product innovation. It is also likely to be diûcult to measure the monetary value of incremental or process innova- tion, while in the case of product innovation the value is much more easily measured, particularly in cases where the innovation outcome is patented.

Such diûculties may reduce workers' incentive to engage in process in-novation when a ûrm introduces

monetary incentive schemes.

As for R & D organization, von Zedtwitz et al. (2014) argue that the degree to which R & D projects should be carried out in a decentralized fashion depends on various factors such as the type of innovation and the nature of the project. Centralization is necessary for more radical innovation, while decentralization is possible for incremental innova- tion. Their argument suggests that centralized R & D organization is more conducive to product innovation while decentralized R & D or- ganization is more conducive to process innovation.

2.5. Complementarity among management practices

Another issue related to the various management practices is the interaction among them. Some management practices may be com- plementary and the choice of management practices is potentially en- dogenous. As pointed out in the literature review by Seeck and Diehl (2017), human resource management practices implemented in bundles have an overall positive eûect on innovation, while independently implemented practices do not, highlighting the importance of com- bining complementary human resource management-speciûc resources. An example is provided by the study by Chen and Huang (2009), which suggests that strategic human resource practices and knowledge man- agement practices are complementary in terms of boosting innovation by enabling ûrms to acquire external and internal knowledge, sharing and exchanging knowledge among organizational members, and ap- plying knowledge eûectively. Their ûnding also implies that there likely is complementarity between cooperation and coordination across business units and human resource management.

Jung et al. (2003) argue that transformational leadership by the top

manager can enhance organizational innovation directly as well as in- directly by creating a climate that supports innovation. Their result also suggests that human resource management is complementary to other organizational management practices such as cooperation and coordination across units and restructuring of R & D organization.

Although quite a few studies underline the importance of combining complementary management practices, theoretical explanations on the underlying mechanisms have not yet been suûciently explored. Because the deûnition and/or measurement of management practices vary greatly across studies, systematic theory-testing and development is very challenging (Seeck and Diehl, 2017).

2.6. Hypotheses

Thus, although the relationship between management practices and innovation outcomes has been examined in many previous studies, comprehensive studies that simultaneously look at a variety of man- agement practices are still scarce. Consequently, our knowledge on the magnitude of the impact of each management practice and/or bundles of practices is still limited. That is, little is known about which practices have the largest impact, which combinations of management practices are the most eûective, and whether the impact of each practice or bundles of practices diûers depending on the types of innovation such as product innovation, breakthrough innovation, or process innovation. Based on the arguments and ûndings of the studies reviewed above, we posit the following hypotheses regarding the relationship between various management practices and innovation output:

Hypothesis 1. Cooperation and coordination across business units or divisions at the ûrm as a whole

Cooperation and coordination across business units or divisions is positively linked with innovation in both products and production processes. However, the strength of the relationship may diûer between product and process innovation depending on the cognitive styles of team members.

Hypothesis 2. Human resource management with regard to R & D personnel

As for human resource management, each management practice has a diûerent impact on product and process innovation. Strong leadership and incentive payments are more likely to be positively linked with product innovation than process innovation. Although personnel as- sessment reûecting R & D outcomes is expected to be positively asso- ciated with both product and process innovation, incentive payments may be negatively associated with process innovation. The relationship between age diversity and innovation success is somewhat ambiguous, but is likely to be negative if disagreement among old and young researchers impedes cooperation.

Hypothesis 3. Restructuring the organization of R & D

The optimal structure of R & D organization depends on the type of case of process innovation.

In the following sections, we examine the factors which aûect the likelihood that ûrms innovate, using a large-scale ûrm-level dataset on product and process innovation. More speciûcally, we aim to in- vestigate complementarities among various management practices and to examine which management practices are strongly associated with innovation outcomes.

3. Overview of the organizational and human resource management practices in Japanese ûrms

3.1. Data

The data used in this study are the ûrm-level data from the Japanese National Innovation Survey (J-NIS).[3] The survey is based on the Oslo Manual and provides a wide range of information on ûrms' innovation activities and their outcomes.

The J-NIS was conducted in 2003, 2009, 2012, and 2015, and the data collected in the 2003, 2009, and 2012 surveys were available for the purpose of academic research at the time of writing of this study. However, each survey is considerably diûerent in terms of sample size and size distribution of responding ûrms.[4] Moreover, the questions and the choices provided for answers were also quite diûerent, although all the surveys are based on the Oslo Manual. This means that only the 2009 J-NIS asks about human resource management for researchers and organizational management of research units/divisions, while the 2003 and the 2012 J-NIS focus more on organizational management of the entire ûrm. For these reasons, we use the 2009 J-NIS data for this study. In addition, for our empirical analyses below, we eliminate observations for ûrms that did not provide information on their total sales amount. As a result, we are left with 3837 observations for 2009. The number of ûrms by industry is provided in Appendix A Table A1. Although more detailed (3-digit level) industry information is available, we classify ûrms into 11 manufacturing industries and 7 non-manu- facturing industries. Our cross-section database includes 1589 manu- facturing ûrms (41.4%) and 2248 ûrms that fall into non-manu-

facturing industries (58.6%).

3.2. Overview of innovative ûrms and factors that determine ûrms'innovation behavior

In this study, we focus on product innovation as an outcome of in- novation activities. In our dataset, 1218 ûrms (31.7%) out of the total 3837 ûrms answered that they successfully innovated new products and/or

services in the preceding three years (i.e., 2006–2008 for the 2009 survey).[5] innovation, the nature of the project, and the possibility of combining resources. That said, restructuring R & D organization in pursuit of optimizing a ûrm's R & D organization is expected to be positively linked with both product and process innovations. Empowerment of employees is also expected to be positively linked with innovation, particularly product innovation, by providing intrinsic motivation to researchers to produce creative ideas.

Hypothesis 4. Complementarity among management practices Human resource management practices and organization management practices such as cooperation and coordination across units and restructuring of R & D organization are complementary each other. Therefore, implementing more than one management practice at the same time is expected to be associated with a higher probability of success in both product and process innovations. However, in the case of process innovation, some human resource management practices such as incentive pay and age diversity may not be positively associated with innovation success. Consequently, complementaries among human resource and organization management practices may be weaker in the

The statistical analysis of the ûrm-level data was conducted at the First Theory- Oriented Research Group, National Institute of Science and Technology Policy (NISTEP), Ministry of Education, Culture, Sports, Science and Technology (MEXT) under arrange- ments that maintain legal conûdentiality requirements. The ûrm-level data from this national survey are available to researchers for academic research purposes.

[4] Although in all the surveys, the questionnaire was sent out to a sample of ûrms with 10 or more employees, the size distribution of the sample ûrms is very diûerent across surveys. In the 2003 survey, 19% of the ûrms that answered were large ûrms (250 or more employees), while in the 2009 survey 48% were large ûrms. We could try to con- struct a panel consisting of ûrms that responded to all the three surveys. Unfortunately, however, there are very few such ûrms, so that we do not have a suûcient number of observations. For more details on the 2003, 2009, and 2012 J-NISs, see National Institute of Science and Technology Policy (2004, 2010, 2014).

[5] We closely examined the data in order to check whether the propensity to innovate was aûected by the 2007–2008 global economic crisis. While, as mentioned above, the samples across the diûerent survey years diûer considerably, so that strictly speaking they

are not comparable, we did not ûnd any notable particularities regarding the propensity to innovate in the 2009 survey. For example, comparing the sample of large manu- facturing ûrms (ûrms with 250 or more employees) across surveys, 54% of such ûrms in the 2009 survey responded that they successfully innovated new products and/or ser- vices, while the corresponding ûgures in the 2003, 2012, and 2015 surveys are 51%, 44%, and 45%, respectively.

As for internal factors which aûect ûrms' innovation activities, we focus on organizational and human resource management within a ûrm. The survey asks 11 questions regarding organizational and human

Table 1

Number of ûrms implementing diûerent combinations of the three broad categories of organizational and human resource management. resource management for the purpose of eûcient R & D activities during the preceding three years. For simplicity, we aggregate the 11 questions into 8 items and group them into 3 broad categories. Categories O1 and O3 are related to narrowly-deûned organizational management

while category O2 is related to human resource manage- ment: Combinations (O1, O2, O3)

Number of ûrms (Total = 3837)

Product innovation = Yes Product innovation = No

		1218	(100.0%)	2619	(100.0%)
None (0, 0, 0)		*205*	*(16.8%)*	*1463*	*(55.9%)*
One		*294*	*(24.1%)*	*639*	*(24.4%)*
(1, 0, 0)		259	(21.3%)	549	(21.0%)
O1) *Cooperation and coordination across business units or divisions at the firm as a whole*	(0, 1, 0)	26	(2.1%)	84	(3.2%)
	(0, 0, 1)	9	(0.7%)	6	(0.2%)
- Interdivisional cooperation/teams: The firm implemented rotationof employees across divisions or created project teams across divisions.	*Two*	*379*	*(31.1%)*	*408*	*(15.6%)*
	(1, 1, 0)	303	(24.9%)	363	(13.9%)
	(1, 0, 1)	67	(5.5%)	40	(1.5%)
	(0, 1, 1)	9	(0.7%)	5	(0.2%)
- Interdivisional meetings/systems: The firm held meetings across divisions or introduced systems which accumulate, exchange, or share information across divisions.	*All (1, 1, 1)*	*340*	*(27.9%)*	*109*	*(4.2%)*

O2) ***R & D personnel human resource management***

– Board members with R & D background: The ûrm assigned a person from the R & D division as a board member.

– Personnel assessment reûecting R & D outcomes: The ûrm reûected R & D outcomes in the assessment of researchers or engineers.

– Incentive payments: The ûrm employed an incentive payment scheme to reward inventions by employees.

– Employment or re-employment of retired researchers or engineers: The ûrm employed or re-employed researchers or engineers who had reached retirement age.

O3) ***Restructuring of R & D organization***

– Creation/relocation/integration/reorganization of R & D centers or divisions: The ûrm created, relocated, integrated, or reorganized centers or divisions of the ûrm's R & D activities.

– Increased authority for researchers/engineers: The ûrm increased or extended the authority of researchers or engineers.

In addition to questions asking about these management practices, ûrms were also asked whether they had innovated new products and/or services in the preceding three years. Table 1 shows the distribution of ûrms in terms of their answers to these questions. First, in order to obtain a broad overview of the characteristics of management practices at Japanese ûrms, we look at the number of ûrms which had implemented at least one practice in each of the three categories, O1, O2, and O3. Table 1 lists various combinations of management practices and shows the number of ûrms for each combination. The combination (1, 0, 0), for example, represents ûrms that had implemented at least one of the two practices in category O1 but none of the practices in categories O2 and O3. Similarly, the combination (0, 1, 1) represents ûrms that had not implemented any of the practices in category O1 but had implemented at least one practice in category O2 and at least one practice in category O3. Further, ûrms are divided into those that had replied that they had innovated new products and/or services in the preceding three years and those that had not.

As seen in Table 1, the majority of non-innovating ûrms (55.9%, 1463 ûrms out of the 2619 non-innovating ûrms) had not implemented any of the management practices listed in the three categories, i.e., their

combination was (0, 0, 0), while most of the innovating ûrms (83.2%, i.e., 100%–16.8%) had implemented at least one of the management practices listed above. Table 1 thus clearly shows that innovating ûrms are much more likely to focus on organizational and human resource management for R & D. That being said, practices in category O1 (cooperation across business units at the ûrm level) are quite widespread even among non- innovating ûrms: 1061 (=549 + 363 + 40 + 109) ûrms out of the 2619 non-innovating ûrms (40.5%) implement at least one of the practices in category O1, while the corresponding ûgures for categories O2 and O3 are 561 (=84 + 363 + 5 + 109) and 160 (=6 + 40 + 5 + 109), respectively. Among innovating ûrms, 969 (=259 + 303 + 67 + 340) out of 1218 ûrms (80%) implement at least one of the practices in category O1, while 678 (=26 + 303 + 9 + 340) and 425 (=9 + 67 + 9 + 340) ûrms implement at least one of the practices in categories O2 and O3, respec- tively. Further, the number of ûrms implementing practices in the O3 category (restructuring of R & D organization) is much smaller than that of ûrms implementing practices in the O2 category (human resource management), particularly in the case of non-innovating ûrms. One possible explanation is that restructuring of R & D organizations may be a less important or more diûcult practice than human resource man- agement.

More importantly, a signiûcant number of ûrms implement prac- tices in more than one category, particularly in the case of innovating ûrms. 379 ûrms (31.1%) out of the 1218 innovating ûrms implement practices in two out of the three categories, and 340 ûrms (27.9%) implement practices in all three categories, while 294 ûrms (24.1%) implement practices in only one of the three categories. However, in the case of non-innovating ûrms, the number and share of ûrms that im- plement practices in all three categories is very small: 109 ûrms or 4.2%. The fact that a substantial share of innovating ûrms implement all three types of management practices simultaneously suggests that all three categories are potentially important for greater eûciency of R & D activities and that there may be some complementarities among the diûerent management practices.

4. Complementarities between organizational management and human resource management practices

4.1. Empirical model

Our initial aim is to examine which combinations of management practices determine a ûrm's innovation success and how large the magnitude of the impact of respective combinations is. Furthermore, we statistically test complementarities among the practices. Speciûcally, we measure two types of innovation outcomes: product innovation and process innovation. Based on the J-NIS2009 data, we identify whether a ûrm introduced new or signiûcantly improved products (or production processes) during the preceding three years or not.

We start by estimating a probit model in order to examine what factors determine the probability that a ûrm introduces new or signiûcantly improved products (or production processes). The probit model assumes that there exists an underlying relationship, $y_i^* = X_i \hat{a} + u_{1i}$, where $u_{1i} <$" $N(0,1)$. y_i^* is a latent innovation variable for ûrm i measuring the propensity to innovate, while X_i is a vector of ûrm characteristics including the combinations of management prac- tices implemented. The corresponding observed variable, y_i^{probit}, is a binary variable, which takes a value of one for innovators and zero otherwise: While this is a limitation of this study, we can examine the direction and strength of the relationship between management

practices and innovation success. However, it should be noted that throughout this study we mainly focus on the positive or negative association between management practices and innovation outcomes and do not test rigor- ously for causal relationships or eûects.

We estimate selection Eq. (2) with all observations. We calculate the inverse Mills ratio using Eq. (2) and then estimate Eq. (1) with the $y^{probit} = (y^* > 0)$ restricted observations including the estimated inverse Mills ratio. We should note that ûrms likely decide ûrst whether to invest in R & D activities before they introduce new products or processes. Moreover, ûrms that do not invest in R & D activities in most cases do not have an oûcial R & D section or department, and are very unlikely to implement any of the management practices regarding R & D orga- nization and R & D human resources. In other words, the estimation results may be biased when the decision of undertaking innovation activities and engaging in R & D management are correlated. We therefore have to take this sample selection into account and conse- quently employ a probit model with sample selection to address the potential selection bias. More speciûcally, employing Heckman's (1979)

two-step estimation approach, we estimate the determinants of ûrms' R & D decision in the ûrst stage and then estimate the determinants of innovation success in the second stage. For the ûrst stage estimation *i*

regarding whether a ûrm is engaged in R & D activities, the binary choice variable we use, y^{select}, is whether the ûrm reports positive R & D expenditure for 2006, i.e.: explanatory variables of main interest to us are the dummy variables representing various combinations of ûrms' organizational and human resource management practices. The deûnitions of these variables are the same as those shown in Table 1 and we prepare seven dummy variables representing the same combinations of management practices presented in the table, with ûrms that employ none of the practices serving as the reference group. As outlined in the hypotheses in Section 2.6, we generally expect all three broad types of management practices (O1, O2, and O3) to be positively linked with both product and process innovation. However, some of the human resource management practices considered in this study – namely, incentive payments and age diversity – may have a negative relationship with innovation. The ne- gative or ambiguous eûect of these human resource management practices may weaken the positive eûect of the other two types of management practices.

As other explanatory variables, we also include ûrms' R & D intensity, which is measured as the logarithm of the ratio of R & D ex- penditure to total sales, the logarithm of number of markets, and in- dustry dummies based on the 18 industries presented in Appendix A

$iy^{select} = (z_i\,\tilde{a} + u_{2i} > 0)$

Table A1. The reason for including industry dummies is to capture technological opportunity conditions, industry-targeted innovation

where u_{2i} <“ $N(0,1)$. If $\tilde{n}$ (the correlation of u_1 and u_2) `” 0, standard probit techniques yield biased results. As we obtain a statistically sig- niûcant ñ, we employ the probit model with sample selection.[6] As explanatory variables in the ûrst stage, z_i, we use the logarithm of ûrms' total sales in 2006 as a proxy for ûrm size[7] and industry dummies to capture industry-speciûc factors such as technological characteristics and competitive pressures. We also include various management prac- tice variables and the logarithm of the number of markets in which ûrms supply their products and/or services as a proxy for the range of their

activities. Distinguishing 10 regions around the world, including Japan, the J-NIS 2009 asked in which regions ûrms sell their products and/or services, and we use this information to count the number of markets (i.e., regions) for each ûrm. For identiûcation, we excludeûrms' total sales in the second-stage probit model. However, it should be noted that our analysis does not allow us to rigorously examine the causal relationship. The reason is that ûrms may be more likely to implement various management practices if they are undertaking R & D activities that are certain to bring forth new products than if this were not the case. We cannot rigorously address the endogeneity between the decision to implement management practices and the probability of innovation success, since our data are not panel data and we cannot control for unobserved ûrm-speciûc factors which aûect the certainty of new product development. As described in Section 5 below, we tried some instrumental variables, but found it very diûcult to ûnd eûective ûrm-level instruments. Therefore, we mainly rely on the Heckman-type probit model with sample selection without instrumental variables.

In fact, we obtained similar results when we restricted our sample to ûrms with positive R & D expenditure and estimated the second-stage equation only. However, we report the results with sample selection because ñ was signiûcantly diûerent from zero and the inverse Mills ratio was also statistically signiûcant. Taking account of the fact that many ûrms conduct both product and process innovations simultaneously, we also tried bivariate probit regressions for process and product innovation equations using the re-

stricted sample of ûrms with positive R & D expenditure. The results were consistent with our main results shown in Table 2.

[7] Information on the number of employees for each ûrm is not available. The only available information is the number of employees who are engaged in research activities.

policies, industry-speciûc demand growth eûects, and structural eûects such as the intensity of competition. Appendix A Tables A2 and A3 respectively present descriptive statistics and correlation coeûcients for all the variables.

4.2. Results

The results of the probit estimation with sample selection (average marginal eûects) for Eq. (1) above are shown in Table 2.[8] Looking at the results, some of the combinations of management practices, namely, combinations (1,1,0), (1,0,1) and (1,1,1), are positively associated with both product and process innovation. In the case of product innovation, marginal eûect of combinations of more than one practice tends to be larger than that of just one practice. For example, O1-type management practices do not have a signiûcant eûect on product innovation if merely implemented in isolation. However, when a ûrm implements both O1-type and O2-type management practices at the same time, the marginal eûect of the combination (1,1,0) on product innovation is 0.139 and statistically signiûcant, meaning that the probability to in- novate a new product is 13.9% points higher than the probability to innovate of a ûrm which implement none of the management practices, (0,0,0). Comparing the marginal eûects of (1,1,0) and (1,1,1), adding O3 practices increases ûrms' innovation probability by 10.1% point (=24.0–13.9). On the other hand, comparing the marginal eûects of (1,0,1) and (1,1,1), adding O2 practices increases ûrms' innovation probability by 5% points (=24.0–19.0).

The results indicate that in the case of product innovation, im- plementing all three management practices

at the same time has the highest marginal eûect, suggesting that implementing diûerent types of management practices is positively associated with innovation success. However, in the case of process innovation, there is no monotonic in- crease in the magnitude of marginal eûects as the number of practices [8] The estimated coeûcients for the ûrst and second stage estimations are shown in Appendix A Table A4.

Table 2

Marginal eûects of management practice combinations on innovation: Product innovation and process innovation. process innovation. We also found that implementing diûerent types of management practices at the same time is important for innovation success, particularly for product innovation.

Product innovation
selection = implement R & D

	dy/dx	s.e.	dy/dx	s.e.
Log (R & D/Sales)	0.020	0.202	−0.342	0.169**
Log (Nb. of markets)	0.087	0.023***	0.067	0.022***
Combi (0,1,0)	0.019	0.084	0.072	0.075
Combi (0,0,1)	−0.064	0.204	0.369	0.196*
Combi (0,1,1)	0.071	0.163	0.007	0.145
Combi (1,0,0)	0.018	0.041	0.247	0.032***
Combi (1,1,0)	0.139	0.037***	0.174	0.033***
Combi (1,0,1)	0.190	0.069***	0.278	0.063***
Combi (1,1,1)	0.240	0.041***	0.259	0.038***
Industry dummies	YES		YES	
Nb. of observations	3837		3837	
Log pseudolikelihood	−2230.06		−2198.53	
Chi^2	195.05***		295.22***	
Wald test (rho = 0)	20.00***		50.58***	

Process innovation

selection = implement R & D

In this section, we look at each management practice in more detail.

As outlined in Section 3.2, each of the three management categories, O1, O2, and O3, comprises between two and four detailed management practices. Table 3 shows the number of ûrms which implemented each of the management practices included in the three categories. Firms are further divided into two groups: ûrms which successfully innovated new products in the preceding three years and ûrms which did not.

Looking at Table 3, a large number of ûrms – including non-innovating ûrms – implemented both of the two practices in category O1 (co- operation across business units). On the other hand, there seems to be a clear diûerence between innovating ûrms and non-innovating ûrms in human resource management (O2). Among innovating ûrms, the number of ûrms is relatively evenly distributed across the three prac- tices: personnel assessment reûecting R & D outcomes, incentive pay- ments, and employment or re-employment of retired researchers or engineers. However, among non-innovating ûrms, employment or re-

*, ** and *** indicate signiûcance at the 10%, 5% and 1% level, respectively. Reference group: ûrms with combination (0, 0, 0). implemented increases. Comparing the coeûcients across the diûerent combinations, adding O2 practices seems to reduce the size of the coeûcient, implying that implementing O2 practices

may have a ne- gative impact on process innovation. As mentioned above, some types of human resource management practices may have a negative eûect on process innovation. The result implies that it is more diûcult to identify who contributes to innovation success in the case of process innovation and that large pay diûerentials among employees may decrease colla- boration and hinder process innovation.

Further, we ûnd that the coeûcients on the variables for the dif- ferent combinations are generally larger for process innovation than for product innovation, and in the case of process innovation are (weakly) signiûcant even in cases where only one type of practice is im- plemented. The results in Table 2 thus suggest that while implementing diûerent types of management practices at the same time is important for product innovation, in the case of process innovation even im- plementing only O3 or O1 practices already boosts the chances of in- novation success.

For the case of product innovation, we also check whether the magnitude of the coeûcient is signiûcantly larger the larger the number of practices ûrms implemented using the Wald test, and the results are shown in Appendix A Table A5. Appendix Table A5 shows the signiûcance level of the diûerence between the coeûcient on the combination shown in the row of the table and the coeûcient on the combination shown in the column of the table. The results conûrm that the coeûcient tends to be signiûcantly larger the larger the number of practices ûrms implemented.[9]

5. Which management practices matter for innovation success?

5.1. Details on R & D organizational and human resource management practices

So far, we focused on the three broad categories of organizational and human resource management, O1, O2, and O3, and found that such management practices are positively associated with product and [9] Given that the results above suggest the existence of complementarities between diûerent types of management practices, we also tested for complementarities among O1, O2, and O3 based on the complementarity test suggested by Kodde and Palm (1986). However, we did not ûnd statistically signiûcant complementarities for any pair of the three types of management practices. Nevertheless, our results above imply that product innovation is positively correlated with the number of practices implemented.

employment of retired researchers or engineers is much more wide- spread than other practices, and personnel assessment reûecting R & D outcomes is much less widespread. In contrast, personnel assessment reûecting R & D outcomes is the most widespread O2 practice among innovating ûrms. Finally, looking at the two practices in category O3 (restructuring of R & D organization), the number of non-innovating ûrms implementing such practices is much smaller than that im- plementing practices in categories O1 or O2, while among innovating ûrms a substantial number of ûrms implement practices in category O3. Although unfortunately further detailed information on each prac- tice is not available, these ûgures imply that there are signiûcant dif- ferences in management practices between innovating and non-in- novating ûrms, and that these diûerences likely determine innovation outcomes at the ûrm level.

5.2. Econometric methodology and results

In this section, we examine which management practices are asso- ciated with the probability that ûrms innovate and assess the magni- tude of the impact. We start by estimating a probit model with sample selection in order to investigate which factors determine the propensity to innovate new products or services and the propensity to innovate new processes. Similar to the estimations in Section 4, we estimate

the determinants of ûrms' R & D decision in the ûrst stage and then estimate the determinants of innovation at the second stage. For the ûrst-stage estimation, we use the same dependent variable as in the ûrst-stage estimations in Section 4, namely, a binary variable which takes one if a ûrm reports positive R & D expenditure. As explanatory variables, we include the logarithm of ûrms' total sales in 2006, the logarithm of the number of markets in which the ûrm supplies its products and/or ser- vices, industry dummies, and eight dummy variables representing the management practices listed in Table 3, namely, interdivisional co-operation/teams, interdivisional meetings/systems, board members with an R & D background, personnel assessment reûecting R & D out- comes, incentive payments, employment/re-employment of retired re-searchers/engineers, creation/relocation/integration of R & D centers, and increased authority for researchers/ engineers. For the second-stage estimation, we use the same dependent variable as in the estimations in Section 4, namely, a binary variable which takes one if a ûrm innovates new products (or processes) and zero otherwise. As explanatory vari- ables, we include ûrms' R & D intensity as well as the same explanatory variables as in the ûrst stage, but we exclude ûrms' total sales in the second-stage estimation.

The binary dependent variable – i.e., whether a ûrm innovates or not – does not indicate how signiûcant new products are in the market in which ûrms operate. We therefore also employ an alternative mea-sure of innovation outcomes as a dependent variable. Speciûcally, we

Table 3

Number of ûrms implementing organizational and human resource management practices.

Number of ûrms (Total = 3837)

	Product innovation = Yes		Product innovation = No	
Total number of firms	1218	(100.0%)	2619	(100.0%)
O1) *Cooperation across business units*				
Interdivisional cooperation/teams	770	(63.2%)	677	(25.8%)
Interdivisional meetings/systems	922	(75.7%)	982	(37.5%)
O2) *Human resource management*				
Board members with R & D background	219	(18.0%)	73	(2.8%)
Personnel assessment reflecting R & D outcomes	415	(34.1%)	155	(5.9%)
Incentive payments	386	(31.7%)	222	(8.5%)
Employment or re-employment of retired researchers or engineers	362	(29.7%)	399	(15.2%)
O3) *Restructuring of R & D organaization*				
Creation/relocation/integration of R & D centers	388	(31.9%)	129	(4.9%)
Increased authority for researchers/engineers	117	(9.6%)	54	(2.1%)

Table 4

Marginal eûects of management practices on innovation: Product innovation and process innovation.

Product innovation	Process innovation
selection = implement R & D	selection = implement R & D

	dy/dx	s.e.		dy/dx	s.e.
Log (R & D/Sales)	−0.062	0.219		−0.426	0.237*
Log (Nb. of markets)	0.083	0.024***		0.082	0.023***
Interdivisional cooperation/teams	0.092	0.035***		0.131	0.031***
Interdivisional meetings/systems	0.001	0.037		0.105	0.032***
Board members with R & D background	0.089	0.047*		0.007	0.043
Personnel assessment reflecting R & D outcome	0.150	0.037***		0.051	0.037
Incentive payment	−0.046	0.037		−0.094	0.035***
Employment or re-employment of retired researchers or engineers	−0.043	0.035		−0.028	0.033
Creation/relocation/integration of R & D centers	0.112	0.037***		0.065	0.036*
Increased authority for researchers/engineers	−0.026	0.052		0.078	0.051
Industry dummies	YES			YES	
Nb. of observations	3837			3837	
Log pseudolikelihood	−2192.91			−2433.4	
Chi^2	209.94***			307.05***	
Wald test (rho=0)	21.80***			45.16***	

Signiûcant * at 10%, ** at 5%, *** at 1%.

Table 5

Marginal eûects based on interval regression.

Catch-up time dy/dx s.e.

construct a variable representing the technological superiority of a new products using information on the time a ûrm thinks it would take competitors to catch up with its most important innovative product.

In the J-NIS 2009, ûrms were asked to choose one of the following six answers regarding how long it would take competitors to invent a similar product: (1) less than 6 months; (2) 6 months to 1 year; (3) 1–3

Log (R & D/Sales)	“0.458	0.333
Log Sales (2006)	0.046	0.043
Log (Nb. of markets)	“0.345	0.111***
Interdivisional cooperation/teams	0.317	0.157**
Interdivisional meetings/systems	“0.257	0.197
Board members with R & D background	0.368	0.179**
Personnel assessment R & D outcome	0.469	0.147***
Incentive payment	“0.083	0.156
Employment or re-employment of retired researchers or engineers	0.061	0.163
Creation/relocation/integration of R & D centers	0.249	0.142
* Increased authority for researchers/engineers	0.097	0.190
Industry dummies	YES	
Nb. of observations	1218	
Wald chi^2	120.53***	

Signiûcant * at 10%, ** at 5%, *** at 1%.

years; (4) 3–5 years; (5) 5–10 years; and (6) more than 10 years. The more superior a new product or

service innovation is, the longer it will take competitors to catch up, so that we use the answers to this question to indicate how signiûcant a product innovation is.

Only ûrms that innovated new products were asked this question on how long it would take competitors to catch up. In the analysis using this alternative measure of innovation outcome as the dependent variable we therefore restrict our sample to ûrms that achieved product innovation. More speciûcally, we conduct an interval regression with the 1218 innovating ûrms in our sample. Interval regression ûts a model in which the dependent variable may be measured as point data, interval data, left-censored data, or right-censored data. We therefore create a dependent variable containing the lower and upper endpoints of the above 6 choices. Doing so, we end up with 227 left-censored observations (ûrms responding that the expected catch-up time was equal to or less than 6 months), 22 right-censored observations (ûrms responding that the expected catch-up time was equal to or more than 10 years), and 969 interval observations.

We ûrst present the results of the probit estimation which examines the factors determining whether ûrms innovate or not (Table 4). Then, in the latter half of this section, we present the results of the interval regression taking account of the technological superiority of a new product (Table 5). Table 4 shows the results of the probit estimation with sample selection (average marginal eûects).[10] While some of the organizational and human resource management practices are asso- ciated with both product and process innovation, others are associated with product or process innovation only. Speciûcally, interdivisional cooperation/teams, and creation/relocation/integration of R & D cen- ters are positively associated with both product and process innovation. Interdivisional meetings/systems is positively associated with process innovation only. On the other hand, having board members with an R & D background and personnel assessment reûecting R & D outcomes are positively associated with product innovation only, while incentive payments are negatively associated with process innovation only.

While interdivisional cooperation/teams and interdivisional meetings/systems have a higher marginal eûect than personnel assessment and restructuring of R & D centers in the case of process innovation, the opposite is observed in the case of product innovation. These results suggest that horizontal communication across divisions and teamwork are more important for process innovation. On the other hand, board members with an R & D background, personnel assessment, and drastic changes in R & D organization are more important for product in- novation, implying that top-down R & D decision-making may have a larger impact on product innovation. In fact, in the case of product innovation, the marginal eûect of having a board member with an R & D background is 0.089, implying that assigning a person with an R & D background as a board member increases the probability of in- novating new products by 8.9% points. Given the fact that the share of product innovators in the total sample is 31.7% (=1218/3837; see Table 1 or 3), this is a signiûcant increase in the probability.

In line with the results in Table 2, the results in Table 4 suggest that human resource (O2-type) management practices do not have any po- sitive and signiûcant impact on process innovation. In fact, incentive payment schemes – one of the human resource management practices – even seems to be negatively associated with process innovation, sug- gesting that pay diûerentials hinder collaboration among employees and process innovation. On the other hand, the results in Table 4 show that interdivisional cooperation and meetings are particularly im- portant for process innovation.

As for product innovation, all three types of management practices (O1–O3) are important, which is consistent with the results in Table 2. More importantly, however, the positive association between board members with an R & D background and the creation/relocation/[10] The estimated coeûcients for the ûrst- and second-stage estimations are shown in Appendix A Table A6. We also estimated the same probit model with sample selection but without some explanatory variables that are highly correlated with other explanatory variables. However, the results were similar to those in Table 4 and are therefore not shown. (They are available from the authors on request.) Moreover, as in Section 4, we restricted our sample to ûrms with positive R & D expenditure and estimated the second- stage equation only. We also tried bivariate probit regressions for the process and product innovation equations using the restricted sample of ûrms with positive R & D expenditure. Again, the results were similar to those in Table 4. Given that ûrm-level R & D intensity potentially is an endogenous variable, we also tried IV probit estimation. For the in- strumental variable, we constructed a binary variable representing the degree of com- petition in the market. Speciûcally, the variable takes a value of one if a ûrm answered in integration of R & D centers on the one hand and product innovation on the other suggests that top-down R & D decision making and selective resource allocation increase the propensity to innovate. That is, such practices possibly reûect and/or engender the active management of a ûrm's innovation portfolio. This result is in line with Klingebiel and Rammer's (2014) argument that ûrms' innovation portfolio management and allocation of innovation resources are potentially important determinants of their innovation performance. Moreover, the creation/ relocation/integration of R & D centers may also promote interdivi- sional communication. Because new product development and in- novation require the application and combination of specialized knowledge inputs from many diûerent areas (Yli-Renko et al., 2001), these two practices potentially reinforce each other and raise the pro- pensity to innovate.

On the other hand, there is no signiûcant association between the employment or re-employment of retired researchers or engineers and either type of innovation, and the coeûcient estimate is even negative. As mentioned in Section 2.2, employee diversity can have both positive and negative eûects on innovation performance. The insigniûcant re- sults in our study suggest that the positive and negative eûects cancel each other out.

Next, turning to the role of authority for researchers or engineers, the results indicate that such authority has no signiûcant impact on both product and process innovation. On the other hand, incentive payments are negatively associated with process innovation, while no statistically signiûcant eûect is observed in the case of product in-

novation. As mentioned in Section 2, previous studies tend to suggest that intrinsic motivation (i.e., individuals' enthusiasm for science) is more important for researchers' performance than extrinsic motivation through, e.g., ûnancial incentives.[11] Our ûnding of a negative re-lationship between incentive payments and process innovation is in line with those studies; on the other hand, the reasons for the insigniûcant result in the case of product innovation deserves further investigation in the future. Meanwhile, personnel assessment reûecting R & D outcomes has a signiûcantly positive marginal eûect on product innovation, raising the probability of introducing new products by 15.0% points. A possible interpretation of these results is that ûnancial incentives may be counterproductive in fostering an environment that stimulates pro- cess innovation, while personnel assessment either oûers incentives to innovate new products/services – for example, by

providing recognition

– or helps to identify the most innovative R & D personnel.[12]

The results of the interval regression are presented in Table 5. They show that four types of management practices have a signiûcantly positive impact in terms of generating signiûcant product innovations (where the signiûcance of innovations is gauged based on the time ûrms expect it will take rivals to catch up): interdivisional cooperation/teams, having board members with an R & D background, personnel assessment reûecting R & D outcomes, and the creation/relocation/integration of R & D centers. Both in Tables 4 and 5, these practices have a signiûcant and relatively large po- sitive marginal eûect. Therefore, all our results suggest that among the various management practices, these four practices are important for achieving product innovations, particularly signiûcant innovations that take longer to replicate (referred to as "breakthrough innovations" hereafter). It is interesting to note that the use of interdivisional cooperation/ teams is a practice in category O1, while having board members with an R & D background and relying on personnel assessment reûecting R & D outcome the J-NIS questionnaire that its products/services became more diversiûed or the lifecycle of its products/services became shorter, and zero otherwise. In addition, we constructed a range of other instrumental variables. However, the test of overidentifying restrictions indicated that our instrumental variables were likely to be correlated with the error term when we used two instrumental variables. Thus, it was extremely diûcult to ûnd good and eûective instrumental variables, given that ûrm-level ûnancial or performance in- formation other than R & D-related information is quite limited in our data and our da- taset is not a panel but a cross section. Therefore, we only show the IV probit estimation results using the binary variable representing the degree of competition in the market as an instrument in Appendix A Table A7. As can be seen, the results are broadly consistent with those in Table 4.

[11] Although there are an increasing number of theoretical and experimental studies by psychologists, sociologists, and economists on researchers' intrinsic and extrinsic moti- vation (e.g., Bénabou and Tirole 2003; Manso 2011), systematic empirical studies using real-world data are extremely scarce. One of the few exceptions is the study by Owan and Nagaoka (2011), who examine the relationship between the strength of inventors' in- trinsic and extrinsic motivation and their productivity (proxied by patent applications) using large-scale survey data of Japanese inventors.

[12] Kanama and Nishikawa (2017), using the same dataset as our study, ûnd that per- formance-based evaluation promotes innovation, while monetary compensation does not, which is consistent with our results.are practices in category O2, and the creation/relocation/integration of R & D centers is a practice in category O3. This implies that both organi- zational and human resource management signiûcantly aûect ûrms' in- novation outcomes. As for human resource management of R & D personnel, while personnel assessment reûecting R & D outcomes has a large positive marginal eûect in terms of achieving breakthrough innovations, incentive payments and the employment or re-employment of retired researchers or engineers do not have a signiûcant impact in terms of achieving signiûcant innovations.

Moreover, having board members with an R & D background and the creation/relocation/integration of R & D centers have a signiûcant positive marginal eûect, which is consistent with the results on product innovation in Table 4 and implies that drastic top-down decision- making seems to foster breakthrough innovation.

6. Conclusion

In this study, we examined the link between ûrms' organizational and human resource management of their research units on the one hand and innovation outcomes on the other. Our ûndings can be summarized as follows. First, implementing more than one management practice at the same time is associated with a higher probability of innovating new pro- ducts. Our results suggest that implementing diûerent types of organiza- tional and human resource management practices at the same time sig- niûcantly raises the probability of product innovation. However, in the case of process innovation, the magnitude of the marginal eûects does not monotonically increase in the number of practices implemented: the human resource management practices considered in this paper do not necessarily raise the probability of process innovation when they are implemented to- gether with other organizational management practices.

Second, particularly for product innovation, we found that four types of management practices – namely, the use of interdivisional cooperation/teams, having board members with an R & D background, personnel assessment reûecting R & D outcomes, and the creation/re- location/integration of R & D centers – are positively associated with innovation success. The results were very similar when we focused on breakthrough innovation, i.e., taking the technological superiority of products into account.

The results suggest that human resource management of R & D personnel is an important determinant of innovation success and that providing the right incentives to motivate researchers and assessing researchers are important for promoting breakthrough innovation.

Our results also suggest that having board members with an R & D background and the creation/relocation/integration of R & D centers are important for product innovation. Top-down R & D decision-making and drastic organizational changes may serve as clear signals of a ûrm's determination to pursue an innovation-oriented strategy and help to accelerate innovation success. Moreover, these practices may help ûrms to allocate innovation resources eûectively and promote interdivisional communication or communication with external information sources. Shiseido, a global cosmetics company headquartered in Japan, provides an example: in 2015, the company announced a plan to reform its R & D organization and establish one of the world's largest cosmetics research facilities in the city of Yokohama (The Nikkei, March 27, 2015). According to the announcement, Shiseido was planning to adopt an open lab where customers, marketers, and researchers mingle on a daily basis. The expectation was that such an environment would strengthen basic research as well as research in new ûelds. Shiseido's case thus provides a concrete example of a ûrm restructuring its R & D organi- zation in order to create an environment in which researchers can easily communicate with workers in other divisions and/or even outsiders.

It is often argued that generating value from innovation has been getting much harder in the past few decades, especially for many Japanese ûrms that have had to contend with a long period of economic stagnation during the so-called "two lost decades." For example, the Cabinet Oûce of the Government of Japan (2011) reports that the ef-fectiveness of R & D (i.e., the ratio of value added generated by the private sector to R & D expenditure calculated using the country-level R & D data taken from OECD.stat) has been declining in many devel- oped economies, with the decline particularly pronounced in Japan. Our ûndings provide a clue as to how the eûectiveness of R & D could be boosted, for instance by implementing personnel assessment not in isolation but in combination with a system of knowledge sharing among researchers and workers. Our results also suggest that having board members with an R & D background and the restructuring of R & D centers can help to allocate resources eûectively and create an en- vironment in which knowledge sharing is promoted, boosting the likelihood of successful product innovation.

Given various data limitations, however, these results should be interpreted with caution. For example, our data contain no detailed information on the assessment and/or payment system each ûrm em- ploys. The eûects of the pay-for-performance system may depend on the relative importance of incentive payments

compared to ûxed payments. Similarly, the eûects of personnel assessment may depend on the im- portance of research outcomes in personnel assessments, that is, the extent to which research outcomes are taken into account in personnel assessments and/or the promotion of researchers. Moreover, whether or not, or to what extent, researchers' wages reûect the result of personnel assessment may aûect their motivation and change the rate and di- rection of innovation. Due to data constraints, however, we cannot control for the relative importance of incentive payments and personnel assessment or the potential links between them. Moreover, we also do not know details on R & D organizational changes, that is, whether an R & D center was created, relocated, or integrated. To understand the relationship between organizational structure and innovation success, it would be necessary to combine quantitative analyses such as those in this study with detailed case studies.

Last but not least, as mentioned above, data limitations mean that we cannot rigorously examine the causal relationship between man- agement practices and innovation success. In order to examine causal relationships and the mechanisms underlying such relationships, we would need to construct ûrm-level panel data and/ or utilize various data sources for detailed ûrm-level information. Although data con- straints mean that this is not an easy task, we believe that future studies which address these issues would provide further insights to gain a better understanding of ûrms' innovation and the role of organizational and human resource management.

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Appendix A

Industry	ISIC Rev. 3.1	Number of firms
Manufacturing		1589
Food products and beverages, tobacco products	15–16	121
Textiles; wearing apparel; dressing and dyeing of fur; tanning and dressing of leather; manufacture of luggage, handbags, saddlery,harnesses and footwear	17–19	104
Wood and products of wood and cork, except furniture; articles of straw and plant materials; paper and paper products; publishing, printing and reproduction of recorded media	20–22	141
Coke, refined petroleum products and nuclear fuel; chemicals and chemical products	23–24	134
Rubber and plastic products	25	102
Other non-metallic mineral products	26	62
Basic metals and recycling; fabricated metal products, except machinery and equipment	27–28, 37	201
Machinery and equipment n.e.c.	29	156
Office, accounting and computing machinery; electrical machinery and apparatus n.e.c.; radio, television and communicationequipment and apparatus; medical, precision and optical instrument, watches and clocks	30–33	335
Motor vehicles, trailers and semi-trailers. Other transport equipment.	34–35	167
Furniture, n.e.c.	36	66
Non-manufacturing		2248
Agriculture, hunting and forestry, fishing, mining and quarrying	1–2, 5, 10–11,	104
	13–14	
Electricity, gas, heat supply and water	40–41	275
Wholesale and retail trade; repair of motor vehicles	50–52	825
Transport and storage; postal services	60–64	327
Telecommunications	64	246
Financial intermediation	65–67	163
Real estate; rental and leasing activities; business services	70–74	308
Total		3837

Table A2
Descriptive statistics.

Variables	Number of observations	Mean	Std. Dev.	Min	Max
Innovation outputs Product innovation	3837	0.317	0.466	0	1
Process innovation	3837	0.571	0.495	0	1
Catch-up time	1218	2.716	2.145	0.5	10
EXplanatory variables Log (R & D/Sales)	3837	0.006	0.039	0.000	1.684
Log Sales (2006)	3837	7.919	1.946	0.000	16.203
Log (Nb. of markets)	3837	0.784	0.517	0.000	2.398
O1) *Coorperation across business units*					
Interdivisional	3837	0.377	0.485	0	1
cooperation/teams Interdivisional	3837	0.496	0.500	0	1
meetings/systems O2) *Human resource management* Board members with	3837	0.076	0.265	0	1
R & D background Personnel assessment	3837	0.149	0.356	0	1
reflecting R & D outcome Incentive payment	3837	0.158	0.365	0	1
Employment or re-	3837	0.198	0.399	0	1

O3) *Restructuring R & D organization*

Creation/relocation/ integration of R & D centers Increased authority for	3837 3837	0.135 0.045	0.341 0.206	0 0	1 1
researchers/engineers					
Combination (O1, O2, O3)Combi (0,1,0)	3837	0.029	0.167	0	1
Combi (0,0,1)	3837	0.004	0.062	0	1
Combi (0,1,1)	3837	0.004	0.060	0	1
Combi (1,0,0)	3837	0.211	0.408	0	1
Combi (1,1,0)	3837	0.174	0.379	0	1
Combi (1,0,1)	3837	0.028	0.165	0	1
Combi (1,1,1)	3837	0.117	0.321	0	1

Table A3
Correlation coeûcient matrices.
Panel (a): Variables used for the Heckman probit model estimations (Tables 2 and 4: 3837 observations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Product innovation	1.000													
(2) Process innovation	0.408	1.000												
(3) Log (& D/Sales)	0.107	0.061	1.000											
(4) Log Sales (2006)	0.274	0.230	0.023	1.000										
(5) Log (Nb. of markets)	0.329	0.302	0.115	0.334	1.000									
(6) Combi (0,1,0)	−0.030	0.001	−0.002	−0.055	−0.011	1.000								
(7) Combi (0,0,1)	0.038	0.027	0.001	−0.001	0.011	−0.011	1.000							
(8) Combi (0,1,1)	0.042	0.023	0.000	0.010	0.026	−0.010	−0.004	1.000						
(9) Combi (1,0,0)	0.003	0.084	0.006	0.003	−0.019	−0.089	−0.032	−0.031	1.000					
(10) Combi (1,1,0)	0.135	0.167	0.027	0.095	0.137	0.079	0.029	0.028	0.237	1.000				
(11) Combi (1,0,1)	0.112	0.103	0.009	0.063	0.053	−0.029	−0.011	−0.010	−0.088	−0.078	1.000			
(12) Combi (1,1,1)	0.344	0.286	0.115	0.252	0.320	−0.063	−0.023	−0.022	−0.188	−0.167	−0.062	1.000		
(13) Interdivisional cooperation/teams	0.359	0.382	0.103	0.299	0.289	−0.134	−0.049	−0.047	0.267	0.306	0.133			
0.373	1.000													
(14) Interdivisional meetings/systems	0.356	0.397	0.084	0.259	0.305	−0.171	−0.062	−0.060	0.435	0.416	0.142			
0.339 0.649	1.000													
(15) Board members with R & D background	0.267	0.197	0.123	0.231	0.291	0.016	−0.018	0.032	−0.148	0.151	−0.049			
0.412 0.270 0.246	1.000													
(16) Personnel assessment R & D outcome	0.369	0.303	0.132	0.257	0.338	−0.019	−0.026	0.036	−0.216	0.285	−0.071			
0.348 0.371 0.380 0.422	1.000													
(17) Incentive payment	0.296	0.250	0.106	0.292	0.326	0.045	−0.027	0.045	−0.224	0.378	−0.074			
0.437 0.335 0.362 0.365 0.495	1.000													
(18) Employment or re-employment of retired researchers or engineers	0.169	0.216	0.052	0.135	0.238	0.244	−0.031	0.111	−0.257	0.473	−0.084			
0.344 0.302 0.340 0.274 0.311 0.344	1.000													
(19) Creation/relocation/integration of R & D centers	0.367	0.299	0.111	0.284	0.318	−0.068	0.134	0.141	−0.204	−0.181	0.350			
0.809 0.359 0.327 0.365 0.440 0.362 0.261	1.000													
(20) Increased authority for researchers or engineers	0.170	0.165	0.066	0.051	0.128	−0.037	0.088	0.050	−0.112	−0.099	0.186			
0.448 0.194 0.177 0.148 0.265 0.166 0.171 0.296	1.000													

Panel (b): Variables used for the interval regression (Table 5: 1218 observations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		(8)	(9)	(10)	(11)	(12)	
(1) Catch-up time	1.000						
(2) Log of R & D/sales	0.007	1.000					
(3) Log of sales (2006)	0.052	-0.041	1.000				
(4) Log (nb.of markets)	-0.064	-0.020	0.054	1.000			
(5) Interdivisional cooperation/teams	0.125	0.056	0.244	-0.012	1.000		
(6) Interdivisional meetings/systems	0.081	0.008	0.205	-0.030	0.558	1.000	
(7) Board members with R & D background	0.141	0.078	0.258	-0.038	0.210	0.186	1.000
(8) Personnel assessment R & D outcome	0.220	0.107	0.222	-0.033	0.316	0.329	0.356
	1.000						
(9) Incentive payment	0.100	0.080	0.304	-0.015	0.248	0.288	0.336
	0.437	1.000					
(10) Employment or re-employment of retired researchers or engineers	0.107	0.031	0.182	-0.075	0.248	0.246	0.287
	0.289	0.342	1.000				
(11) Creation/relocation/integration of R & D centers	0.158	0.051	0.253	-0.029	0.291	0.264	0.315
	0.400	0.298	0.229	1.000			
(12) Increased authority for researchers/engineers	0.094	0.027	-0.008	-0.030	0.145	0.119	0.076
	0.199	0.087	0.159	0.255	1.000		

Table A4

Estimated coeûcients for the Heckman probit model: Management practice combinations.

	Product innovation selection = implement R & D			Process innovation selection = implement R & D	
	coeff.	s.e.		coeff.	s.e.
Log (R & D/Sales)	0.057	0.559		−1.044	0.518**
Log (Nb. of markets)	0.242	0.066***		0.204	0.069***
Combi (0,1,0)	0.053	0.232		0.221	0.229
Combi (0,0,1)	−0.177	0.565		1.126	0.600*
Combi (0,1,1)	0.197	0.453		0.021	0.444
Combi (1,0,0)	0.049	0.115		0.754	0.109***
Combi (1,1,0)	0.386	0.106***		0.532	0.102***
Combi (1,0,1)	0.526	0.193***		0.850	0.195***
Combi (1,1,1)	0.666	0.115***		0.791	0.117***
Selection equation (Dependent variable:Implement R & D)					
Log Sales (2006)	0.063	0.015***		0.062	0.015***
Log (Nb. of markets)	0.439	0.054***		0.431	0.054***
Combi (0,1,0)	0.670	0.145***		0.661	0.146***
Combi (0,0,1)	0.844	0.402**		0.831	0.401***
Combi (0,1,1)	1.083	0.337***		1.063	0.338***
Combi (1,0,0)	0.724	0.071***		0.718	0.071***
Combi (1,1,0)	0.955	0.071***		0.946	0.071***
Combi (1,0,1)	1.252	0.138***		1.242	0.137***
Combi (1,1,1)	1.363	0.087***		1.350	0.087***
Inverse mills ratio	0.116	0.019***		0.059	0.019***
Industry dummies	YES			YES	
Nb. of observations	3837			3837	
Log pseudolikelihood	−2230.06			−2198.53	
Chi^2	195.05***			295.22***	
Wald test (rho=0)	20.00***			50.58***	

*, **, and *** indicate signiûcance at the 10%, 5%, and 1% level, respectively.

Reference group: ûrms with combination (0,0,0).

Table A5

Chi-square test on the weight of pairs of combinations: Product innovation.

	(1,0,0)	(0,1,0)	(0,0,1)	(1,0,1)	(1,1,0)	(0,1,1)	(1,1,1)
(1,0,0)	n.a.			**	***		***
(0,1,0)	n.a.	n.a.		*			***
(0,0,1)	n.a.	n.a.	n.a.				
(1,0,1)	n.a.	n.a.	n.a.	n.a.			
(1,1,0)	n.a.	n.a.	n.a.	n.a.	n.a.		**
(0,1,1)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
(1,1,1)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

*, ** and *** indicate signiûcance at the 10%, 5% and 1% level, respectively.

n.a.: Not applicable.

Table A6

Estimated coeûcients for the Heckman probit model: Management practices

	Product innovation selection = implement R & D		Process innovation selection = implement R & D	
	coeff.	s.e.	coeff.	s.e.
Log (R & D/Sales)	−0.173	0.608	−1.264	0.704
Log (Nb. of markets)	0.231	0.069***	0.244	0.071***
Interdivisional cooperation/teams	0.254	0.097***	0.389	0.094***
Interdivisional meetings/systems	0.003	0.102	0.311	0.098***
Board members with R & D background	0.248	0.131*	0.021	0.128
Personnel assessment reflecting R & D outcome	0.416	0.102***	0.152	0.108
Incentive payment	−0.129	0.103	−0.280	0.106***
Employment or re-employment of retired researchers or engineers	−0.119	0.097	−0.084	0.099
Creation/relocation/integration of R & D centers	0.312	0.103***	0.194	0.106*
Increased authority for researchers/engineers	−0.073	0.144	0.233	0.151
Selection equation (Dependent variable: Implementing R & D)Log Sales (2006)	0.044	0.015***	0.044	0.015***
Log (Nb. of markets)	0.417	0.055***	0.408	0.055***
Interdivisional cooperation/teams	0.115	0.067*	0.115	0.067*
Interdivisional meetings/systems	0.542	0.068***	0.539	0.068***
	Product innovation		Process innovation	
	selection = implement R & D		selection = implement R & D	
	coeff.	s.e.	coeff.	s.e.
Board members with R & D background	−0.068	0.107	−0.078	0.106
Personnel assessment reflecting R & D outcome	0.502	0.080***	0.498	0.080***
Incentive payment	0.310	0.076***	0.305	0.076***
Employment or re-employment of retired researchers or engineers	−0.105	0.068	−0.101	0.068
Creation/relocation/integration of R & D centers	0.257	0.081***	0.258	0.081***
Increased authority for researchers/engineers	0.409	0.132***	0.397	0.130***
Inverse mills ratio	0.141	0.017***	0.108	0.018***
Industry dummies	YES		YES	
Nb. of observations	3837		3837	
Log pseudolikelihood	−2192.91		−2170.07	
Chi^2	209.94***		275.90***	
Wald test (rho=0)	21.80***		40.26***	

Table A7

Estimated marginal eûects: IV probit model.

IV: ûrms with frequent product/service diûerentiation

	Product innovation		Process innovation	
	coeff.	s.e.	coeff.	s.e.
Log (R & D/Sales)	−38.536	29.771	−131.668	74.084*
Log Sales (2006)	0.035	0.038	−0.090	0.095
Log (Nb. of markets)	0.516	0.156***	0.854	0.386**
Interdivisional cooperation/teams	0.452	0.156***	0.975	0.392**
Interdivisional meetings/systems	0.362	0.093***	0.476	0.234**
Board members with R & D background	0.577	0.298	1.027	0.744
Personnel assessment reflecting R & D outcome	0.664	0.206***	0.977	0.517*
Incentive payment	0.213	0.147	0.342	0.372
Employment or re-employment of retired researchers or engineers	−0.283	0.121**	−0.280	0.304
Creation/relocation/integration of R & D centers	0.677	0.152***	0.762	0.384**
Increased authority for researchers/engineers	0.304	0.195	0.690	0.493
Industry dummies	YES		YES	
Nb. of observations	3837		3837	
Wald chi^2	499.23		93.16	
Wald test of exogeneity	3.67*		42.98***	

- Endogenous variable = Log (R & D/sales)
- IV: A dummy variable which takes one for ûrms that answered that products/services became more diversiûed or the lifecycle of products/services shorter
- *, **, and *** indicate signiûcance at the 10%, 5%, and 1% level, respectively.

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7

Marketing as an Engine of Business Growth: A Cross-Functional Perspective

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Abstract:

While the development of rigorous business disciplines has created deep insights, frameworks and powerful tools, this disciplinary focus also creates blinders that limit creativity in developing holistic solutions to business problems. The author discusses neuroscience research that shows how mental models, such as those implicit in specific disciplines, shape and limit insight and action. He notes that in a rapidly changing world, these models are more likely to be out of synch with the environment. As an example of the potential for applying a cross- functional perspective, he examines opportunities to use marketing insights across the organization to drive growth, including creating a market-driven vision and value proposition, using market insights to drive innovation, leveraging technology and marketing to create convergence, and rethinking the customer experience and relationships. To support these shifts in perspective, he identifies several enablers of interdisciplinary approaches, such as models and dashboards, organizational architecture, and integrative processes. Finally, he examines implications for practice, research, and education.

Keywords: Marketing; Value proposition; Cross-functional integration

1. Introduction

One of the great modern advances in business research and practice has been the establishment of depth in specific disciplines, such as marketing, finance or operations. Organ- izations have functional leaders with deep expertise in these areas. Academic communities, supported by specialized journals and disciplinary departments, have made substan- tial progress in developing concepts, frameworks, perspec- tives and methods through this intensive focus. Yet, in the process, this dissection of management decisions into increasingly small pieces has sometimes caused managers and researchers to lose sight of the bigger picture and the fact that a business is a system and one cannot focus only on one of its subsystems (Ackoff, 1999). There is a need now to increase cross-functional perspectives in management re- search and practice.

CEOs recognize the value of this broader view. At a panel on cross-functional perspectives for MBA students at the Wharton School, Joseph Neubauer, Chairman of ARA- MARK, commented, ''My experience has been that you'll develop the best solutions for any business problem only when you are able to integrate the perspectives of a broad range of disciplines. I've had the great good fortune to get to know hundreds of CEOs around the world, and I can absolutely assure you that being focused is critical, but being functionally narrow is a mistake'' (''Banking on Breadth: CEOs Stress Need for Cross-Functional Perspec- tives,'' Knowledge@Wharton, 2003).

Leaders of individual disciplines are also recognizing the need for a broader scope of thinking and action. At the 2003 CMO Summit, marketing leaders from diverse firms stressed that marketing should be an engine of growth and profitability for the organization. It should link the insights from the market with the strategies of the firm to drive the creation of value through developing relationships with customers. Marketing should create and build leadership brands that consumers love and it should lead the continued transformation

of the company. A McKinsey study presented at the Summit noted three primary opportunities for driving growth: integrating cus- tomer insights more broadly into business functions, integrating business strategies with brand strategies and integrating marketing and go-to-market execution. The common theme is integration.

To achieve this goal of driving growth, marketing cannot be left to the marketers alone. There is a need to integrate marketing perspectives across the organization. There is still debate about whether the organization needs a marketing department as a center of expertise or the work should be more thoroughly diffused, but there is a clear need to apply marketing insights more broadly, particularly in a time when there are fewer opportunities for growth through acquisi- tions or margin improvements through greater efficiencies. At the same time, marketing sometimes has been left out of important decisions where its perspectives are crucial. Many major decisions, such as mergers and acquisitions, have been financially driven with limited involvement by marketing, although their success is dependent upon mar- keting strategies. The AOL/ Time Warner merger was driven by assumptions about advertising and marketing across different channels and its costly failure was, at least in part, due to weaknesses in these assumptions.

The need for marketing perspectives is not limited to making strategic decisions but also is important for the development and use of concepts and tools, such as total quality and data mining. These were developed outside of marketing although they have significant marketing involve- ment and implications. Quality was driven by operations and data mining was driven by information technology (IT). Marketing has not typicallyad a "place at the table" in these decisions and many of these initiatives were not as successful as they might have been as a result.

Even when marketing is invited to the table, the narrow definition of the discipline can make it hard to see innovative solutions. There is a need for a broader, multidisciplinary approach to marketing challenges. Shift- ing to a broader view can also lead to new strategies. For example, marketers at pharmaceutical firms might be faced with the challenge of pricing a new drug. The traditional marketing perspective would be to focus on the product and its pricing, applying pricing models to set the optimum price based on analysis of customers and competitors. This is, however, a very narrow view of the broader problem. Customers care about more than this particular product and their pricing decisions occur in a much broader context. By starting with the customer, the problem is no longer a pricing problem, as shown in Fig. 1.

Customers are looking for a way to secure wellness and the pill is just one means to that end. If managers recognize this, the pill is not a starting point in this process of creating wellness. The broader solution would combine medicine with fitness, nutrition and prevention to promote wellness instead of just treating illnesses through medication. Pills would be part of this overall wellness solution, but would not be the sole focus.

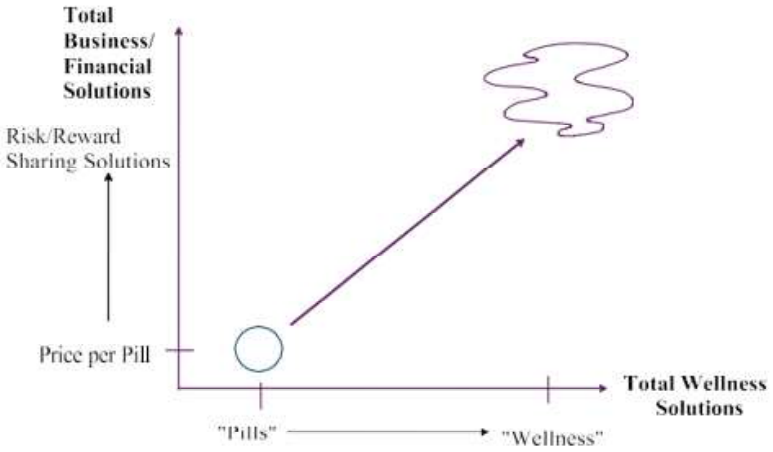


Fig. 1. Illustrative marketing driven business paradigm: a pharmaceutical example.

To create a wellness solution, the company needs to rethink its pricing model to fit this broader perspective. If the company provides more services to promote wellness but still derives its revenue through sales of its pills, it will not be able to sustain the new strategy and will likely lose money. The company has to take a more holistic approach to pricing as well, addressing the concerns of patients, physi- cians, hospitals, insurance companies and other players.

Similar opportunities to move from selling discrete products to offering integrated product and service solu- tions, and moving from price per product to a total financial/ economic solution were found in other industries including computers, financial services, telecom, trading companies and advertising. By looking beyond the narrow view of a product-focused perspective, companies can develop offer- ings that add value for customers and capture that value through new pricing strategies. This requires a fundamental shift in how to view this challenge and deliver on the promise of an integrated solution. It is not a solution that would be created by most marketing departments left to their own devices. It requires a cross-functional involvement of marketing, R&D, medical education, finance, operations and other aspects of the firm considered as a whole.

This is just one example of companies that develop creative solutions for building value by bridging or breaking the narrow disciplinary boundaries that limit thinking in organizations. In this article, we will explore the ways that ''mental models'' limit thinking and how changing these models can open new insights and opportunities for action. We consider how an environment of rapid change makes it more likely that our models could be out of synch with the environment, and thus no longer an effective guide for action. As an illustration, we consider specific ways that marketing perspectives can serve as an engine for growth through several approaches: (1) creating market-driven vision and value proposition, (2) using market insights to drive innovation, (3) leveraging technology and marketing to create convergence and (4) rethinking customer experi- ence and relationships. We will then examine several enablers that can help to build these market-driven, cross- functional initiatives, including marketing models and dash- boards, reshaping the organizational architecture and creat- ing processes for cross-functional integration. Finally, we will explore implications for research and practice.

2. The limits and potential of mental models

As this example shows, business disciplines have created blinders for managers and organizations. The focus on a specific area of the world and a certain set of frameworks for looking at the world tends to shut out other possibilities. Managers and researchers are limited by their mental models and this filters out the solutions that they can see (Wind et al., 2004). The problem is that it is very hard to see these limi- tations.he human mind is very adept at creating the impression of a complete picture. As one example of the power of the mind to fabricate coherent images, the human eye has a natural blind spot where the optic nerve is attached to the retina. This creates a spot where there are no sensory data coming in from the environment, yet people are usually not at all aware of this missing ''hole'' in their vision (except for an experiment in which two dots are brought close to the eye until one dot disappears). Most of the time, the mind fills in this missing piece and we are none the wiser. In a less dramatic fashion, we are constantly filtering external images and information, shaping what we see through our internal mental models.

Recent research in neuroscience has confirmed that we ignore the world, by and large. For example, neurologist Walter Freeman discovered that the neural activity due to sensory stimuli disappears in the

cortex (Freeman, 1995). This stimulation flows into the brain, and it appears to evoke in its place an internal pattern, which the brain uses to represent the external situation—a mental model. External reality is sensed and processed by a phenomenal number of processes and activities, although we are completely un- aware of most of them. The brain, based upon its knowledge of the world, fills in the broad detail, thus creating a complete picture or context (Freeman, 1995).

As an extreme example of how these models allow people to miss important parts of the environment, test participants were asked by researchers to count the number of times basketball players with white shirts pitched a ball back and forth in a video. Most participants were so thoroughly engaged in watching white shirts that they failed to notice a black gorilla that wandered across the scene and paused in the middle to beat its chest. They had their noses so buried in their work that they did not even see the gorilla (Taylor, 2002).

This is equivalent to the marketing manager working in the depths of the organization to market a product that has no chance of strategic success in the market. The market may have shifted, the market needs changed or a new competitor may have come in while managers were internally focused on propelling forward the project. This was the problem for Kodak, which focused too long on its chemical film strategy while the rest of the world was turning to digital. An internally driven marketing campaign may be stunning and effective in achieving its stated goals, but it may be a brilliant solution to the wrong problem. The challenge is to get the questions right before answering them, and the current fragmented approach to business problem solving makes it more likely the right questions will not be asked. This creates the possibility for gorillas to wander through the organization unnoticed as managers are buried in their important disciplinary work. Is this the explanation for the high rate of marketing failures?

Mental models prevent the organization from seeing past its own blinders or the blinders of its industry. This may be why many rule-breaking great ideas have come from indus- try outsiders. Coke and Pepsi did not introduce diet soft drinks or caffeine-free drinks. NCR was not the originator of electronic cash registers. Nike, Reebok and other companies jogged past incumbents Converse and Keds to create the hot new market for running shoes. Kendall missed out on disposable diapers, Fed Ex delivered on the idea of over- night service right under the noses of UPS and the US Postal Service, Swiss watchmakers lost time to digital watch upstarts and Levis had its seams ripped out by designer jeans (Schnaars, 1992).

Breaking through current mental models has tremendous power. The 4-minute mile was an unthinkable barrier until British runner Roger Bannister broke it on an Oxford track in 1954. Two months later, another runner also broke this magical threshold that had seemed beyond human achieve- ment. Within 3 years, 16 runners had turned in times of less than 4 minutes for the mile. Had there been some break- through in human evolution that allowed this achievement? No. The runners were the same. They had changed their mental model and this opened up the possibilities for new achievements.

While breakthroughs, such as the 4-minute mile require intensive training in a specific area, they rarely come solely from within a discipline. They are a result of people thinking more broadly, of recognizing the limits of their mental models and challenging them.

2.1. The power of interdisciplinary approaches

Original insights often come from interdisciplinary approaches. For example, mathematician Benoit Mandel-

brot, known as ''the father of fractals,'' invented fractal geometry to describe patterns in which the shape of a larger object is repeated in its smaller fragments. These patterns are seen in nature in ferns, cauliflower heads or river beds, and fractals have been used to generate swirling computer- generated images as well as to describe the clustering of galaxies, stock market fluctuations and fluid turbulence.

Mandelbrot credits his breakthrough to the eclectic environment in which he worked at IBM Research, where, *The Economist* notes, ''unlike university departments, it was not rigidly divided into departmental 'guilds' such as physics, mathematics, and so on. He was free to move from subject to subject, developing what would emerge as his theory of fractal geometry'' (''The Father of Fractals,'' *The Economist*, December 4, 2003). His early exposure to both mathematics and painting also influenced his later work.

The value of outsiders is seen in many scientific break- throughs. Raymond Damadian, the developer of magnetic resonance imaging (MRI) in medicine, noted that he devel- oped this breakthrough as an outsider to the field. In an interview, he also cited a research study that reported that ''60% of new great discoveries were made by an outsider to the field within the first year he was in the field'' (Speed Wood, 2003). Let us not misconstrue this finding as an argument for filling an organization full of superficial generalists. Mandelbrot developed deep expertise in math- ematics that was critical in making his breakthroughs. A manager who is a ''jack of all trades and master of none'' often has little concrete to contribute to the value and success of the organization. Instead, we need managers who have functional depth and broader perspectives. The important thing is to achieve a balance between the special- ized disciplinary depth and the ability to work across disciplines. This prevents managers and the organization from being locked in a view of the forest from 30,000 feet or looking so closely at the details of a specific tree so as to lose all perspective. The challenge is to achieve a balance between disciplinary strength and interdisciplinary insight, not to sacrifice one for the other.

2.2. An environment of rapid change calls for different models

The ability to shift models and think more broadly becomes more important in an environment of rapid change. Because models are a shorthand for reality, they work reasonably well when the environment is stable. The model is a fairly accurate reflection of reality. The biggest prob- lems come in when the world changes quickly. Then, it is quite likely that the models are out of synch with the world—or something appears in the blind spot of the individual or organization that cannot be seen.

The current business environment is filled with unprec- edented uncertainty, change and complexity. Globalization is shifting work and markets to areas that were once outliers, such as India and China. The economy moves rapidly up and down. There are terrorist threats and innovations in technology, such as biotechnology and nanotechnology. There are shifting demographics, with more unmarried households, new attitudes among young consumers and new definitions of families. There is mounting pressure from Wall Street and expectations for growth. Business models and practices are also being transformed rapidly.

All these interrelated forces make it highly likely that the models a manager learned at the start of his career are now less relevant. In a changed environment, these models may not allow the manager to see and act on the real business challenges at hand. Like the saying about old generals, these managers are ''fighting the last war'' rather than engaging in the reality of the current one. And one area where compa- nies and researchers need to reexamine their traditional thinking concerns the role of marketing itself and the balance between functional specialization and multidisci- plinary, cross-functional perspectives.

While this article focuses on opportunities for marketing as an illustration, it is not intended to overemphasize the importance of marketing. This is just one angle on the broader challenge of cross-functional integration. A similar discussion could be advanced from the perspective of R&D, operations, finance or other functional areas of the organization.

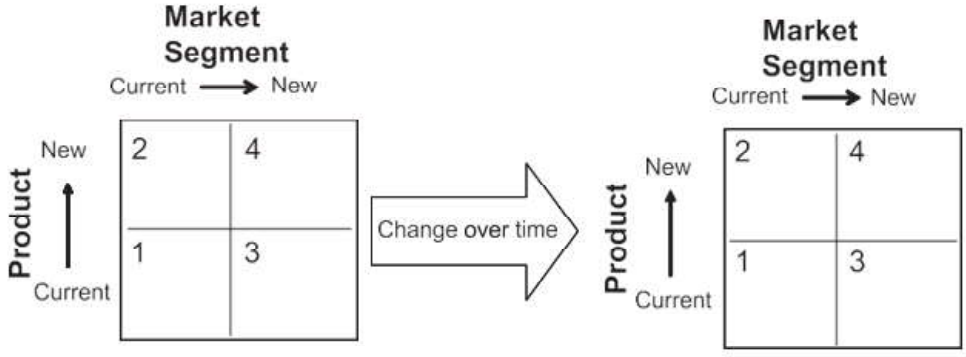
3. Marketing as an engine of growth

Marketing, at the interface between the organization and the environment, can provide new opportunities for value creation and growth. It should be a concern to the entire organization. Marketing provides opportunities by identify- ing opportunities to serve unmet needs of current customers or new customers for the company's current and new products and services. A focus on growth requires an integrated approach, cutting across the organizational func- tions and activities.

In general, organizations have several different options for growth, as illustrated in the left-hand side of Fig. 2. Moving from the lower left quadrant, where they offer their current products and services to current customers, they can either expand their market by offering their products and services to a wider set of customers (moving to the right in the figure) or expand the set of offerings to existing markets (moving up in the figure), or new products for new markets, which is the riskiest strategy. These strategies also change dynamically over time, creating a new set of possibilities for growth, as illustrated in the right-hand side of Fig. 2.

All of these options depend upon marketing insights into unmet needs of current customers or the needs of other market segments that could be met with the company's current set of products and services or new product and service offerings. These strategies for growth also require the involvement of many different disciplines. New product development engages R&D, operations, finance and other areas, in addition to marketing. Moving into new market segments involves IT in gathering information, operations, finance and other areas in addition to marketing.

As the business environment changes, existing markets may be eroded and new opportunities for growth may emerge. If the organization is trapped in its current mental model of the industry and business, it may be hard for managers to see emerging competitive attacks or market possibilities. And if the organization is not able to think and



act across disciplinary lines—with a market-driven ap- proach—it may be very hard to act upon these new insights into strategies for growth.

How can current thinking about marketing be chal- lenged to make it an engine for growth? Among the strategies for using marketing perspectives to drive growth are the following:

- creating a market-driven vision and value proposition,
- using market insights to drive innovation,
- leveraging technology and marketing to create convergence,
- rethinking the customer experience and relationships.

3.1. Creating a market-driven vision and value proposition

Companies need to strengthen the market focus of strategic decisions across functional areas of the firm. This market focus begins with strategies that are built around customer wants and needs, as shown in Fig. 3. While companies, particularly technology-driven firms, have tended to build markets around products, the mar- ket-driven company begins with customers, then develops products and services offerings and finally creates the infrastructure and processes to deliver them. The entire organization is thus organized around this perspective,

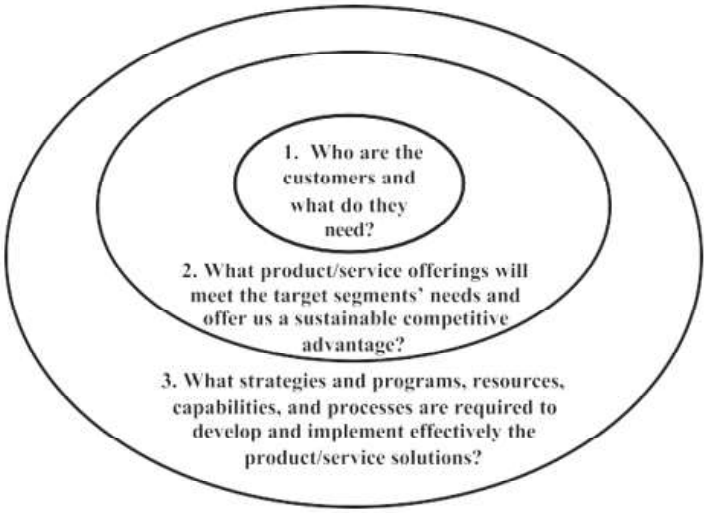


Fig. 3. A marketing perspective.

affecting every aspect of the organization. Instead of seeing the customer as the last point in the company's organization and processes, the customer is the genesis and organizing principle for all the work of the organi- zation in diverse functional areas. This is the perspective Peter Drucker emphasized when he said that ''There is only one valid definition of business purpose: *to create a customer*'' (Drucker, 1954/ 1993). This market-driven strategy has implications for the organization's strategic planning and organizational design to build capabilities such as market sensing, market relating, shared knowl- edge, and collaborative partnering (Day, 1999).

Starting with the customer can offer an opportunity to rethink the definition of the market and industry. For example, Coca-Cola, which had long seen itself locked in fierce but narrowly defined cola wars with rival Pepsi, redefined the playing field from the customer's perspec- tive in its 1999 annual report. In the report, the company reported that it sold 1 billion servings of Coke daily, but had ''47 billion to go.'' The report notes, ''This year, even as we sell 1 billion servings of our products daily, the world will still consume 47 billion servings of other beverages *every day.* We're just getting started'' (Coca- Cola, 1999). Instead of competing against other sodas, Coke redefined its market as all beverages, putting it head-to-head with tea and coffee and water.

The shift to the customer's perspective also allowed Crest to reconceive its business from selling toothpaste to focus on meeting the customer need for "creating happy smiles for life." This is what the market really cared about; toothpaste was just a means to an end. It does not seem like a major shift, but this shift in thinking from the customer's perspective helped open up the possibility of whitening strips and the SpinBrush that were not *toothpaste* but were built around the needs and wants of customers. These and other innovations helped to jumpstart the brand's growth in what was considered a "mature" market.

The customer now at the center, moves from passive audience to active coproducer. Marketing strategy becomes focused on creating, delivering, sustaining and continuously enhancing value. Companies can also expand this focus from customers to all stakeholders—looking at employees, for example, in the same way.

3.2. Using market insights to drive innovation

By taking a broader perspective on marketing, companies can drive innovations in marketing itself, but these innova- tions also require changes in other functional areas. For example, instead of limiting product positioning to product features, companies have used the concept of emotionally based positioning to move the battle from fighting for the minds of customers to fighting for their hearts. Guerrilla marketing and creating buzz have taken marketing out of the mass media and into the streets. Companies such as Red Bull have had great success in building their brands through the power of buzz. These strategies require a rethinking not only of marketing organizations but also sales forces and product and service design. For example, to build buzz about a new product, a company might see its entire set of employees and partners—and even customer "evangel- ists"—as an extended sales force rather than restricting this work to the designated marketing and sales force. This has significant implications for the design of the sales force and incentives as well as the design of the entire organization.

New business models, such as those used by Southwest Airlines, are reshaping competition, with innovations such as new service offerings and revenue models. Ryanair has taken this low pricing to an extreme through zero-fare pricing, with destination cities picking up the tab for airfare instead of passengers. Companies, such as Costco, Amazon and Home Depot, have rethought distribution by inviting the customer into the warehouse or delivering products online. Commerce Bank rethought the traditional model of banking to create "a retail chain that happened to be a bank" (Hill, 2003), offering extended hours, free coin changing and other services that helped propel its 26% compound average growth between 1993 and 2003.

To deliver on these innovations, however, these compa- nies have had to redesign their retail outlets, locations, revenue models and operations. Southwest moved to a no- frills approach based on point-to-point "bus" service rather than traditional hub-and-spoke and full-service flights. Costco built warehouse style stores outside of urban areas and based its revenue model on membership fees rather than margins on goods sold. Commerce Bank had to change its approach to staffing, ATMs and setting rates to deliver on its new model. To create substantial innovations in marketing, companies have to rethink their entire operations.

3.3. Leveraging technology and marketing to create convergence

While IT and marketing are treated as separate worlds in many organizations, companies that can draw

these func- tions together can realize powerful models for building value and driving growth. For example, with the rise of the Internet, companies that took a narrow view of technol- ogy and marketing saw e-business as a separate entity to be either embraced as an independent business that might ultimately replace the existing business or a fad to be ignored. In contrast, companies that could integrate market- ing and technology perspectives were able to build value through the 5 Cs of "convergence marketing" (Wind et al., 2001):

- ***Customerization*:** Combining the manufacturing capabil- ity to customize products with interactive customer interfaces allows companies to invite customers into the laboratory or factory to design their own products. This "customerization" goes beyond selling off-the-shelf products and services to mass markets and even company-driven customization to allow customers to "make it mine."
- ***Communities*:** Combing the interactions in physical and online communities allows customers to "let me be a part of it." Customers can choose to interact with other people and with the company through the type of community that works best for them.
- ***Channels*:** Drawing together diverse channels into a seamless fabric allows customers to interact where and how they choose. This convergence approach allows customers to "call, click or visit."
- ***Choice*:** Giving customers a combination of personal advice and powerful technological tools to make decisions can help them make better choices. Instead of offering ready-made solutions or experts, these tools allow customers to find the information they need to make their own decisions. In addition to planning tools, these include rating services such as BizRate or eBay's customer feedback rankings that give potential customers direct information about the reliability and quality of the seller.
- ***Competitive value*:** New models for pricing, such as eBay's online auctions or Priceline's name-your-own price system, are redefining the way value is determined and divided between producers and consumers. By rethinking operations, marketing and revenue models, companies are redefining competitive value to give customers more for their money. A consumer expecta- tion for 24/7 accessibility, facilitated by technology, has also changed the definition of convenience and other value drivers, and companies have had to change many parts of the organization to deliver on this new expectation.

The power of this convergence is that it helps companies avoid being blinded by either the technology or the mar- ketplace. It offers a balanced approach to innovation that incorporates the old and new, recognizing that while tech- nology may change at blazingly fast rates, people are slower to adapt, and they continue to combine the old and the new. Rather than giving up the mental models of the past, these companies create portfolios of models, in the same way that we use fountain pens and paper, voice mail or e-mail, depending on the occasion. In contrast, some companies took a more limited view. Webvan, for example, a promising online shopping service that went bust during the dot-com rout, pursued a solution that the market was not willing to pay for. In fact, it turned out that many people *like* to shop. In contrast, a company such as UK retailer Tesco, which integrated the new online channel into its existing network of stores and branding, was highly successful in building a strong online market.

These convergence marketing strategies require redefin- ing the business—not just marketing, but IT, operations, finance and other parts of the business. None of these strategies is possible to see or to realize if one focuses on traditional disciplinary functions.

3.4. Rethinking the customer experience and relationships

Another cross-functional strategy that can drive growth is focusing on the total interactive experience of customers rather than a simple, one-way transaction. Initially, compa- nies focused on transactions around products, then moved to products and services, and finally to product and service solutions. The interactive experience is the next step. Instead of a one-way transaction with customers, it is an ongoing interaction. An example of this is the example of the pharmaceutical company discussed above that shifts from the transaction of selling pills to a continuous interaction with customers to promote wellness. This, in turn, changes revenue models and many other strategic decisions of the organization.

These interactive relationships are the first step to chang- ing the role of the customer. Instead of passive "consum- ers," these customers become active stakeholders and advocates. Instead of passively monitoring customer satis- faction, companies are looking at active customer "refer- ence-ability," the likelihood that customers will refer another person to the company. Recent studies have found that it is not customer satisfaction that drives loyalty and repeat purchases, but rather this reference-ability. It does not take much commitment to circle a "highly satisfied" choice on a customer satisfaction form, but it takes a lot more to put your reputation on the line in making a recommendation to others.

Companies are also creating more interactive relation- ships with customers. Instead of focusing on customer relationship management (CRM), which manipulates data to allow the company to best reach customers, firms are developing systems to put customers in charge of customer- managed relationships (CMRs). As a simple example, this might be the difference between offering customers a Web page to view or modify their statement versus giving customers the tools to modify their own page or work with the company on designing innovations. Companies, such as Texas Instruments, which allowed teachers to offer feedback on its calculators for high school students, found that these active "partners" in development became evangelists for the product. (Not only this, but it can save the company

money in the process. Michael Schrage, author of *Serious Play*, estimates that Microsoft beta testers contributed an estimated US$1 billion to the effort of launching Windows

95. These customers spent hours working out bugs and improving the software at no cost to Microsoft. As Schrage (2000), notes, "Microsoft spent less on development of Windows 95 than its customers did.")

Building these interactive relationships with customers requires changes throughout the organization. Any employ- ee who has contact with the customer is involved in the interaction. Systems need to be in place to facilitate the knowledge-sharing needed to effectively interact with cus- tomers when and where they choose. And there need to be effective financial systems and revenue models to ensure that these increased interactions continue to be profitable for the company while delivering value to the customer.

4. Requirements for implementation

Because these approaches to driving marketing growth are based on cross-functional perspectives, they also require a set of cross-functional enablers to carry out. These enablers include marketing models and dashboards to guide progress, the right architecture for the organization and processes to ensure cross-functional integration.

4.1. Using marketing models and dashboards to guide progress

Marketing models and dashboards can help draw togeth- er different parts of the company to drive a marketing perspective across the organization. Marketing tools, such as conjoint analysis, have been applied to new product design to quickly, efficiently and deeply gain an under- standing of customer needs and wants, and design optimal products and services to meet these needs. This approach has proven its worth in a wide range of applications, including the design of new products, such as the Courtyard by Marriott or the E-Z Pass automated toll systems (Wind and Green, 2004). These applications show how these models can have far-reaching implications for diverse areas of the organization. These tools represent the fruits of marketing specialization, but there are opportunities to apply these models to other organizational challenges out- side of marketing. For example, these tools can be used with employees within the firm or to design relationships with partners.

Another powerful way to integrate marketing insights and information into decision making is through the use of decision support systems (DSS) and dashboards. Marketing dashboards, like the dashboard of a car, link key metrics (such as the speed, remaining fuel or distance traveled in a car) with the drivers (the accelerator) and the underlying processes (the combustion engine or braking systems). These company dashboards similarly link a metric, such as demand generation, to drivers, such as increased aware- ness and increasing willingness to try, and to underlying processes, such as marketing initiatives. Like an automobile dashboard, these organizational dashboards convey critical information in real time to allow managers to make deci- sions and midcourse corrections.

The dashboard makes explicit links between key metrics and the drivers and processes that affect them. By identify- ing these underlying drivers and processes, the organization can better understand the cross-functional capabilities and activities that lead to profitable growth. The dashboard can also give the organization objective feedback on these outcomes that allows managers to improve the drivers and processes. Just as the automobile dashboard draws together the separate systems of the car (electrical, fuel, braking, climate control, etc.) the organizational dashboard can help to integrate the diverse systems of the company into a coherent picture of where the organization is headed and what needs to be done to improve its progress. A core process, such as demand generation, involves many func- tions of the organization in addition to marketing. Without a coherent set of dashboards, however, it may be very difficult for the organization to recognize the many interactions that lead to positive results and to change these complex drivers to make improvements. Properly created dashboards pro- vide the mechanism to drive effective management and resource allocation decisions.

Companies also need to use dynamic resource allocation to put their resources where they can have the most impact. Answering the questions of what investment produces the most impact—across the entire organization—necessarily requires a cross-functional view. Managers also need to engage in adaptive experimentation. Through continuous experiments, the company can learn about the environment and test new strategies. At its best, this creates what Steve Haeckel has called a "sense and respond" organization (Haeckel, 1999), an organization tuned to the market.

4.2. Reshaping organizational architecture

A market-driven strategy for growth is supported by changes in complex aspects of organizational

architecture. Without addressing this broader architecture, which cuts across many functional areas of the organization, few change initiatives have a chance of success. The architecture is designed around an understanding of changing needs of organizational stakeholders, including customers, employ- ees, investors and others, as shown in Fig. 4. This under- standing informs the vision, objectives, business paradigm, value proposition and strategy of the organization. The organization's vision and values embody a stakeholder focus, with an emphasis on values, such as exceeding consumer expectations, entrepreneurship and ownership. Finally, the organizational architecture acts to ensure the implementation of this vision and strategy. Thus, organiza- tional design begins with an understanding of the customers and other stakeholders. Metrics, performance measures and incentives should reinforce the vision, objectives and other aspects of the organizational architecture. For example, a decision about people and resources—whether to outsource customer service to India, for example—has implications for diverse aspects of the organizational architecture. This broader view of organizational architecture as an enabler of transformation requires an interdisciplinary perspective.

4.3. Processes to ensure cross-functional integration

Finally, the last enabler in making marketing an engine for growth are processes to ensure cross-functional inte- gration. In general, marketers often see almost every

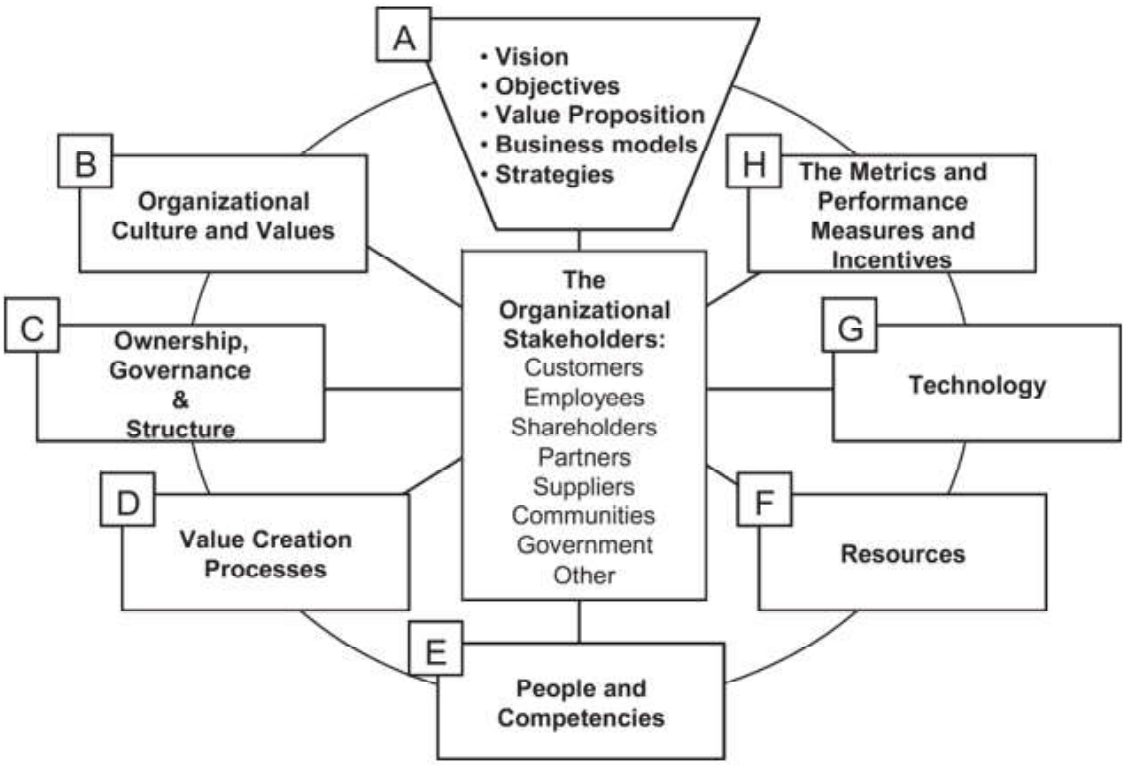


Fig. 4. The organizational architecture of business renewal.

problem as a marketing problem, operations managers see every problem as an operations problem, the CIO will focus on technology and the CFO will look at finance. In a very real sense, however, there are no marketing, oper- ations, IT or finance problems. There are only business problems, the solutions of which are facilitated by insights and knowledge from marketing, operations, finance, hu- man resources and other disciplines. The organization needs processes to ensure this interdisciplinary approach to its business challenges.

These integrative processes are already being seen in initiatives, such as enterprise resource planning, CRM and integrated supply chains. Different parts of the organiza- tion—particularly marketing and R&D—are coming togeth- er to work collectively to develop new products, markets and business development. The emphasis on service across the life of the product is forcing a closer cooperation of any part of the organization that touches the product throughout its life cycle.

For example, Citigroup is turning its customer service into a profitable sales engine by training customer service representatives to use the deep customer knowledge of the organization to make *relevant* offers to callers. The key word is relevant. Many companies are taking a less sophis- ticated approach that actually damages relationships with customers who are looking for a solution but receive a sales pitch for whatever the company is *pushing* instead of an offer relevant to their needs. Creating these relevant pitches requires a close collaboration between marketing, IT, oper- ations, sales, customer service and credit risk assessment. This approach has transformed customer service from a cost center to a successful profit center at the same time that customer satisfaction has increased.

5. Implications for research and practice

5.1. Implications for practice

For managers, the implications are to cultivate a broader view of business challenges to counter the limits of the traditional strong disciplinary focus. Focus on customers, not just the blockbuster brands inside the company. Focus on an integrated stakeholder strategy, integrated marketing strategy and integrated customer experience.

For example, an integrated strategy for a financial services company would focus on serving the customers across diverse financial needs, including savings, credit, retirement and insurance. Beyond integrating these lines of business into more coherent offerings, companies (such as SEI Investments) that have taken the next step to design services around customer needs have recognized that finan- cial needs are just one aspect of a broader set of life needs of individuals. Financial decisions are inextricably intertwined with decisions about security, health and quality of life for the individuals, their families and communities. Based on this insight, SEI Investments structured a financial wellness offering that combines investment, insurance, estate plan- ning and philanthropic decisions into a coherent offering tailored to the needs of the individual.

Similarly, a pharmaceutical company that takes a market- centered view of its work would recognize that patients often have more than one illness. Instead of seeing custom- ers for its drugs for diabetes as a separate market from its customers for drugs for high cholesterol, the company recognizes that an individual patient might have both dis- eases. By starting with the needs of the customer instead of the company's product line, the company could better serve these needs through products and information (such as tailored newsletters) that address both illnesses. The com- pany will not recognize this opportunity unless it begins with a customer perspective in designing its strategies. As discussed at the opening of this article, the company also needs to design revenue models that are aligned with this broader perspective.

An integrated stakeholder strategy draws upon many parts of the organization. An integrated brand promise encompasses product design, packaging, advertising, direct mail, online marketing, collateral, sales force, trade shows, public relations, sponsorships, point-of-sale promotion, cause-related marketing, word of mouth and a whole host of other initiatives. An integrated customer experience would meet the customer

across brands, products and services. It would integrate the product, service and information.

5.2. Implications for research and education

Our academic institutions, tenure tracks and research journals are all built upon microscopic depth in a given field. There is a need for new journals, centers and initia- tives that focus on cross-functional integration. There will always be pioneering researchers who are willing to look beyond the limits of the models of their own disciplines. These leaps into other fields can offer new directions to the field. For example, Paul Green's application of new statis- tical and mathematical psychology models and methods to the field of marketing led to powerful new tools. Daniel Kahneman's application of behavioral research to econom- ics led to richer understanding of economic systems. Will the next innovations come from within a discipline or from researchers courageous enough to recognize the limits of their own models and look outside? While there will always be a few individuals willing to push the envelope, these experiments will remain small unless there are more sys- temic changes that support the development of cross-func- tional perspectives.

To achieve effective cross-functional integration, aca- demic institutions may need to change their organizational architectures. This might include changing the culture to create a more interdisciplinary focus, encouraging more joint appointments across departments, sponsoring interdis-

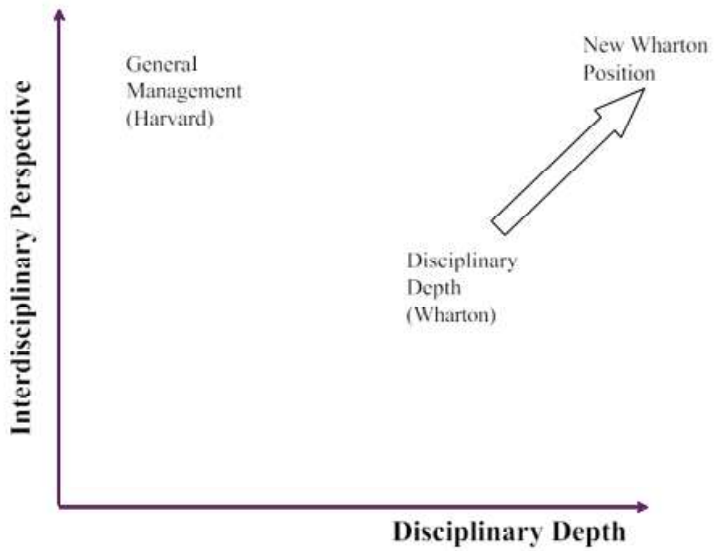


Fig. 5. The need for balance.

• ciplinary research, or developing school or university pro- fessorships for those making cross-functional contributions. Business schools, in particular, need to strike a balance between the "general management" focus of interdisciplin- ary perspective and depth within a specific business disci-

• links among different disciplines and allows faculty to strengthen them. There is also a whole structure to increase the interdisciplinary focus, including shared cases across courses in different disciplines. There are also specific projects that are designed to form an integrative experience for students to help them apply perspectives from different fields to a single project. There are also initiatives to encourage interdisciplinary approaches to research, involv- ing teams of researchers from multiple perspectives.

• Building bridges across the current departmental struc- ture may be an interim solution. While the ideal approach might be to form more of a matrix structure that involves researchers from different

backgrounds in solving common problems or addressing decision areas, these types of structural changes take a long time and a lot of effort to implement. For example, at Wharton, individual depart- ments are housed on separate floors, a physical structure that reinforces a disciplinary focus. Changing such physical structures and organizational structures is difficult. As a first step, building bridges to create a more networked organi- zation can achieve a cross-functional perspective without having to change the underlying architecture.

• pline. As shown in Fig. 5, schools can move in both directions toward this balance. For example, Wharton has created a set of initiatives to strengthen the cross-functional focus of its academic programs and research without sacri- ficing its traditional disciplinary depth. By bringing a more disciplinary focus, schools may actually strengthen their interdisciplinary perspective because grounding in a giving functional area can form a platform for interdisciplinary learning. The reverse is also true. A greater cross-functional focus can enhance the understanding of a specific discipline by allowing students and researchers to see it from a fresh perspective.

• 6. Conclusions

• While these examples illustrate the power of cross- functional strategies in driving growth, there are many ways to achieve a balance between disciplinary depth and the ability to operate effectively across disciplines. Forging these broader perspectives does not always require disman- tling the existing organizational silos built around specific disciplines. Organizations might maintain a disciplinary structure but create linking processes, developing a matrix structure, or engage in creative reengineering and restructur- ing of the entire organization.

• As a first step, organizations can build linking processes among the different functional areas to bridge the silos. For example, when the Wharton School strengthened the inter- disciplinary focus of its MBA program, the school did not start by dismantling departments. The departments are as strong as ever, but the school built a set of linkages and cross-references among the different disciplines—including a "curriculum navigator" that allows students to see the These bridges preserve the inherent strength for a school or an organization in having strong depth in a specific area. Few innovations and deep insights can arise without this kind of deep knowledge. Dismantling these disciplinary advances in favor of an organization of broad generalists would be to sacrifice many of the most significant advances in management, marketing and other business disciplines. As Henry David Thoreau said of "castles in the air," we need to keep these disciplinary tools and insights but now build a foundation of cross-functional integration and per- spectives beneath them so they can be more directly connect with the true business problems facing the organization. This foundation helps avoid the blinders of narrow mental models that can apply this deep expertise to the wrong problem. In research and in practice, creating this common foundation can help cultivate a market perspective across the organization and develop more creative solutions to business challenges.

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The Innovation of Marketing Model

7

Dr. Bhabani Sankar Dash

Abstract: Since the reform and opening up of China, the economy of our country has been greatly developed; especially the popularity of the Internet has promoted the development of our business model. However, as the commoditization trend and the influence of the e-commerce on the traditional marketing model are becoming more and more serious, the enterprises started to explore the innovation of Marketing Model. This paper mainly analyzes some problems existing in China's traditional Marketing and lists several new Marketing Models. Finally it elaborates the principle of the innovation of Marketing Mode.

Key words: Marketing Model; Innovation; Video Marketing; Experiencing Marketing

1. The brief introduction of the marketing model

Marketing model is a unique structure and an effective way of the enterprise business activities and the internal and external resources in order to achieve better customer satisfaction, higher market premiums, or higher sales efficiency.

The so-called corporate marketing model innovation, like other business model innovation, is to find the source and the way to improve the customer delivered value. In terms of improving customer value, is to find and focus on the real or potential needs, and then design the products and the service combination. At the same time we should pay attention to the effective communication and interactive communication, enhance brand image, to improve customer perceived value. And in reducing customer total cost, mainly around the target customer's consumption behavior to optimize product delivery, information inquiry, service providers and other aspects to make them convenient, fast and reliable.

2. The problems existing in the traditional enterprise marketing model

Along with the advance of science and technology, the traditional marketing model has been unable to meet the current social development, gradually showing some problems, here is a summary four.

2.1 Behindhand enterprise concept

2.1.1 Behindhand enterprise marketing concept

Concept is the foundation of all actions, but now many enterprises in China still can't change the correct view of marketing. With the increasingly frequent international communication, the importance of marketing concept in corporate decision-making has reached the point which cannot be ignored. They only focus on their own development, ignoring the needs of users and consumers. They only pay attention to improving the quality of products and expanding the promotional activities, so as to improve the market share of products, and then get more profits. Even some companies have marketing concept is also forced by market competition — passive marketing — cannot combine consumer's demand with enterprise's development and long-term interests of the society, not to take the initiative to marketing concept, guide the enterprise development, to meet consumer demand, to adapt to the needs of society. Some companies

marketing managers have not establish the marketing innovative concept, and the concept of marketing thinking is not enough in advance, which inevitably will meetwith some obstacles in the implementation process of innovation in marketing activities.

If the marketing concept can't keep pace with The Times, it will inevitably lead to an unsatisfied result of enterprise marketing innovation.

2.1.2 Lack of innovation consciousness

With today's international competition intensifying, China's enterprises lag significantly compared to large international companies in using the approach of marketing. No marketing innovation, even no innovation consciousness. No new marketing ideas guide, will inevitably lead to backward marketing mode. A lack of understanding of domestic and international market, resulting in a lack of research and innovation in the actual operation, will only copy someone else's marketing method. Finally, companies will be in a passive status in the competition. Since China joined the WTO, most of our enterprises are in a "transitional period", which led to the company's leaders has not been under the pressure from international market competition. In addition, the influence of the domestic many reasons, including the government policy, etc. As the development of enterprises is relatively stable, the entrepreneur awareness of marketing innovation is relatively weak. Entrepreneurs and even businesses are not willing to bear the brunt of the innovation risk, and marketing innovation lack of initiative, will inevitably lead to its slow development.

2.2 Low flexibility of the marketing organization structure

Marketing organization structure is the organization form taken by a company to carry out marketing. As a carrier of running of enterprise marketing, the organizational structure's operating efficiency and operating results largely determine the effect of corporate marketing. Currently the most common functions of marketing organizational structure is pyramid-style organizational structure adopted by many companies, this organizational structure produced in the traditional economy, its adaptation to the large-scale industrial production model, but with changes in the economic environment, the marketing organization structure mode's disadvantages have fade in. In front of the rapidly changing market changes, the inherent marketing organization structure rigidity problem has become a gap between enterprise and market, one of the barriers to business marketing innovation.

2.3 Lack of professionals

Many leaders and senior managers of companies are attach great importance to the marketing work, but refuse to put a higher capital on the cultivation of the marketing personnel, even don't want to apply the financial and material resources to hire professional sales staff. However, talent is the most important resource and the carrier of all the activities of the enterprise. Carrying out marketing activities need to rely on the implementation of the personnel. Therefore, the quality of the marketing managers will be directly related to enterprise marketing mode which can be promoted smoothly or not.

Under the conditions of new economic times, the important role of marketing professionals get unprecedented highlight, but at present many enterprises' marketing talents in our country are very scarce. The lack of talent has become the bottleneck of restricting enterprises' marketing activities. Marketing model innovation is difficult to carry out, mainly because the marketing starts late in our country as an emerging subject, and

people haven't too much cognitive for marketing connotation. Throughout the various colleges and universities, there are few specialized course of marketing management innovation, in fact, the marketing management innovation-related talents not only have marketing professional background, but also need knowledge of corporate management. Lack of complex background professionals will inevitably hinder the process of innovation of the marketing activities.

2.4 Insufficient use of the forefront of the information

Facing the forefront of the information, the first consideration of traditional enterprise of our country is whether it is consistent with their experience. They are more inclined to take a low-risk approach to marketing. To some extent, this also hinders the pace of innovation. Enterprises are exposed to a lot of information every day, and every enterprise to the understanding of the information is different, the use of information is also different. In recent years, many enterprises based on e-commerce are successful by using this information.

3. Two new marketing models

The development of modern marketing model, compared to traditional marketing model, has obvious advantages. Now we will illustrate the advantages of current marketing model through introduce two new marketing models: Experiential Marketing and Video Marketing.

3.1 Experiential Marketing

With the rapid development of mobile Internet, consumers' psychological needs and behavior structure changed a lot, experience and perception become a key factor in the market. Experiential marketing is a new marketing method with five angles: sensory, emotional, thinking, action and related experience. Informally, experiential marketing is a marketing mode that through intuitive experience brings good feelings and the advantages to customers from the product or service, in order to stimulate customers' purchasing needs. As a new marketing mode, experiential marketing is the inevitable choice of market competition to the advanced stage, and it is of great significance to promote the competitiveness of the enterprise marketing.

In general, experiential marketing is mainly characterized by the following features:

3.1.1 Attach importance to meet the needs of the customer experience

Different from traditional marketing, experiential marketing emphasizes customer demand and focus on customer experience. This experience is bidirectional, mainly exists in the process of sales. The bidirectional interaction can overcome the disadvantage of traditional marketing. It can form the demand communication between enterprises and customers, allowing customers to get the unprecedented experience perception and psychological satisfaction.

3.1.2 Highlight experience-oriented and personalized

As the trend of mobile Internet is more and more obvious, consumers become more active and willing to accept the practice of "try before they buy". Therefore, in the process of experiential marketing, the design, production and sales of enterprise products tend to be experience-oriented, and enterprises tend to provide extensive product range or personalized service as much as possible on the needs of the customer experience as a fulcrum.

3.1.3 Customer demand oriented, and guide consumption through interactive experience

Experiential marketing is to achieve the best state to meet customer needs and business sales. Therefore, in the process of marketing, companies will interact with customers based on customer demand informationÿ seize the customer's interests, encourage customers to choose their own business according to their needs and preferences. As for the key point in the interaction process, companies will optimize the process standing in the perspective of customer psychological demand.

3.1.4 The design of experience model influences marketing effect

Experience model is the key point of the experiential marketing. In order to meet the demand of customers' personalized experience, enterprise design experience model that combine a series of factors of customer perception into modules which may exist independently, to enhance its role on the value of experience. Such as the consumption environment, the contact point, experience processes, products, activities, such as model design and so on. With the development of mobile Internet, companies began to use the ways of reading, video, audio, online presentations, interactive telephone, to bring customers deep experience about profound senses, emotions, thinking, which has achieved the satisfied marketing effect.

3.2 Video Marketing

Video Marketing is a marketing tool that enterprise put all kinds of video clips in various forms on the Internet to achieve certain promotional purposes. The form of online video advertisement is similar to TV video clips, but the platform is on the Internet. The combination of "video" and "Internet" let the innovative marketing form has the advantage of both. It not only has a variety of characteristics of TV clips, such as strong infection, diverse forms of content, wanton creativity, etc., but also has the advantage of Internet marketing, such as interactivity, initiative, fast transmission speed, low cost and so on. It is mainly characterized by the following features:

3.2.1 More intuitive display products

A video contains three forms: text, images and sound. It provides a more intuitive and comprehensive w to display products, enabling consumers to truly understand the product. So a high-value content, entertaining video can not only let customers know all sides of your products, but also hold customer's heart.

3.2.2 Give the initiative to customers

For video playback and product purchase, consumers have absolute initiative. The traditional marketing method is to make the customer passively accept product information. As the extension of time, consumers will have a strong negative emotion.

From the angle of theory of consumer behavior, consumer's antipathy emotions towards advertising may be extended to the brand or product. Therefore, consumers will have some emotional resistance about the information delivered by television advertisement, and thus will have a negative perception of the product. In the process carried out by video marketing, consumers can choose their favorite videos to watch, and even they can also choose independently one to share or pass to other consumers. This also gives the product a good first impression, and easier to deal.

3.2.3 Increase the additional value

Video start as an entertainment to enter into people's lives, so to some extent, it will make people relaxed. In this scenario of product marketing, it can not only bring happiness to consumers, but also let consumers more easily receive the product information. It increases the additional value of the product invisibly.

3.2.4 High interaction

Users can use words to reply video publishers and can also respond to reply, and video publishers also can reply to reviewer's opinion. In addition, the viewer's reply should build momentum for the program. So the higher controversial program will have a higher hit rate. Interaction between information publisher and receiver is conducive to a deeper level of information transmission, to achieve better marketing results.

3.2.5 Low cost

Compared with the TV ads, online video marketing costs are very low. An ordinary television advertising at least cost hundreds of thousands, or even tens of millions, which makes the cost of products greatly increased. However using online video marketing, we just need a few thousand dollars to complete an online video clips. Even a good idea and a few employees can make a good video, and then put it on the video web site free. Compared television advertising, its cost is very low.

3.2.6 The effect is easy to statistical verification

From the video web site, we can clearly understand the video clips' playback, collections and forwarding times of the outside chain. You can view real-time comments of the audience, to understand the audience's opinions, to understand their acceptance of short views. Thus, we can find the scope of the transmission of video clips and their influence. This is the traditional media cannot be achieved.

4. The principle of the innovation of marketing model

The innovation of enterprise marketing model is not a simple matter, and it must follow some basic principles to carry out so that it will not walk overmuch detours.

4.1 Combination of strategy and resource

On the innovation of marketing model, the selected strategies are based on the enterprise own resources. By analyzing the integrated marketing strategy and external integration of external resources and structured operation, the enterprise will achieve a new consumption value or gain competitive advantage. In different market environment and different market positioning, the important degree of product, price, channel, brand, promotion and other marketing strategy elements is different. There must be a strategic factor which is the most important and the most critical one. It is called the"1+N" model. According to difference of the most important factors, the "1+N" model has four basic innovation models of organic combination strategy, which are with the product as the core, with price as the core, with sales promotion as the core, and with channels as the core.

4.2 Systemic

The innovation of marketing model involves all aspects of business. As the "bucket theory" of economic theory explained, any deficiency of business management will affect the results of innovation. In carrying

out the innovation of marketing model, the enterprise not only should consider its own resources, but also understand the external environment in which it is. It requires not only the effort of the marketing department, but also other branches' effort. Only in this way can innovation of corporate marketing model succeed and can it find a suitable business marketing model.

4.3 Integration

Innovation of marketing model is essentially the effective integration of marketing functions. It can fully exploit marketing innovation's role in promoting by the integration of various marketing functions.

The system of modern marketing functions should include merchandise sales, market research, production and supply, creating balanced market requirements and coordinating public relations. Therefore, only integrate these five functions together, can it really play the role of marketing model.

4.4 Constancy

Launching a marketing innovation is end without the stop of a marketing management activity. However, it is a process of continuous improvement cycle, which is improved in the next marketing innovation activities through summarizing the last marketing problems in innovative activities, so as to continuously strengthen the effectiveness of marketing innovation.

4.5 Market-oriented

Launching a marketing innovation should be market-oriented. Carrying out various tasks should serve to and subject to the needs of the target market. Customer demand should be placed in the highest position to guide corporate marketing innovation activities. To get customer satisfaction as the goal in everything and everywhere, to provide customers with personalized service, to expand sales and maximize profits [4].

The success of innovation of corporate marketing model is neither easy, nor once and for all. We not only want to keep up with changes of market and industry, but also combine with their own resources and capacity. We need assess the situation, system planning, actively and steadily, step by step, in order to achieve transformation and innovation of marketing model beneficially and effectively.

The research project of Shanghai soft science research base in 2013: Building competitiveness research framework of strategic emerging industries—taking new energy automobile industry as an example in Shanghai science and technology innovation and public management research center (13692180600).

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Research on the Impact of Digital Finance on Innovation and R & D of Technology-Based SEMs

—Moderating Role Based on Financial Flexibility

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Abstract: Digital finance can effectively ease corporate financing constraints and en- hance corporate R & D innovation capabilities. Taking the financial data of technology-based SMEs on the Growth Enterprise Market from 2013 to 2020 as a sample, the fixed effect model is used to empirically test the im- pact of digital finance and financial flexibility on enterprises' R & D in- vestment from the external environment and internal mechanism. The re- sults show that digital finance has a significant positive impact on the R & D investment of technology-based SMEs through the breadth of coverage, depth of use and degree of digitization; Financial flexibility is positively correlated with R & D investment of technology-based SMEs, and has a positive moderating effect on the relationship between digital finance and R & D investment; Further heterogeneity analysis shows that the impact of digital finance on the R & D investment of enterprises is heterogeneous due to the different life cycles and regions of enterprises. Therefore, technology-based SMEs should focus on the coordination of internal and external financial resources based on their own characteristics, and effectively sup- port innovative R & D activities.

Keywords: Digital Finance, Financial Flexibility, R & D Investment, Technology-Based SMEs, Heterogeneity

1. Introduction

It is an important part of the "14th Five-Year Plan" outline to improve the market-oriented mechanism of technological innovation, strengthen the do- minant position of enterprises in innovation, and promote the concentration of various innovation elements in enterprises, thereby strengthening the sup- port for innovation of Small and Medium-sized Enterprises (SEMs). Under the guidance of various national policies, the number of technology-based SEMs has grown rapidly, which have gradually become an important body to pro- mote the construction of China's modern economic system, support the de- velopment of the knowledge economy, cultivate new momentum, and promote high-quality development. It is also an important force to promote the nation- al innovation strategy and strengthen the dominant position of enterprises in innovation. Therefore, only through continuous R & D investment can tech- nology-based enterprises continuously improve their innovation capabilities and realize the transformation from "followers" to "leaders" in technological innovation.

According to the Statistical Bulletin of National Science and Technology Funding Investment in 2020, the expenditure on research and experimental de- velopment of enterprises was 1867.38 billion yuan, an increase of 10.4% over the previous year. In the context of fighting against the new crown pneumonia epi- demic, the R & D expenditure of enterprises can still maintain a moderate growth rate, which shows that the status of Chinese enterprises as the main body of innovation is constantly being consolidated. However,

innovation is an activ- ity with strong uncertainty, high risk and high cost, and the stable resources required for it are constrained by financing (Seker, 2012). Due to the limitation of information channels, weak guarantee ability and high operating risks, the problems of financing difficulties and high financing costs for SEMs are more prominent. The role of financial means can effectively alleviate this problem (Zhuang & Si, 2021). A good external financial environment can change the effi- ciency of resource allocation, directly affect the supply channels of corporate funds, and facilitate corporate innovation. Based on its own digital, intelligent and networked characteristics, digital finance realizes the integration of digital technology and financial services, breaks the traditional "two eight rules", and has outstanding performance in terms of service radius, service depth and ser- vice availability. It is a powerful supplement to traditional finance. With the help of Internet big data and cloud computing platforms, it can accurately locate customers, reduce the risk of resource mismatch, and play a significant role in alleviating the financing constraints of technology-based SMEs and enhancing innovation capabilities (Jiang et al., 2022). However, at the same time, due to the need for technical confidentiality and the uncertainty of the transformation of scientific and technological achievements, technology-based SMEs have exacer- bated the information asymmetry between banks and enterprises, resulting in high due diligence costs, high risks and low enthusiasm for banks. In this case, to ensure investment in innovation, it is more dependent on its own financial re- serves. Heath, who first proposed the concept of financial flexibility, believes that financial flexibility is an emergency ability for enterprises to avoid financial dis- tress by quickly adjusting cash flow (Heath, 1978). Gamba and Triantis, from the

perspective of investment and financing costs, believed that financial flexibility is the ability of enterprises to obtain new financing sources at low financing costs (Gamba & Triantis, 2008). At this time, enterprises with strong financial flexibil- ity can replace the financing constraints to a large extent to ensure the R & D investment of enterprises.

At the same time, digital finance is a new type of financial service channel. In the process of orderly development, there are also problems such as arbitrage by some financial institutions and disrupting the financial capital market, which brings hidden risks to the stable development of the financial industry (Zhao et al., 2021). Therefore, does digital finance really benefit the innovation invest- ment of technology-based SMEs? This issue remains to be further confirmed. At present, research on digital finance is mostly related to macroeconomics and na- tional livelihood. Research shows that digital finance plays a role in promoting rural economic development, increasing residents' income and consumption, promoting industrial structure upgrading, and enhancing environmental gover- nance and high-quality urban development (Lu & Wang, 2021; Sun & Xu, 2021; Zhu & Zhang, 2022). However, the research on micro-enterprises mostly starts from the theoretical mechanism, and analyzes the effect of digital finance on en- terprise value and investment efficiency by alleviating corporate financing con- straints and reducing information asymmetry (Yang, 2019; Li et al., 2021; Cai et al., 2020). These literature provides a useful reference for the study of "Digital Financial Environment—Enterprise Innovation Investment".

The possible innovations of this paper lie in: 1) R & D capability, as an im- portant element to maintain the vitality of enterprises, has attracted extensive attention, but the current research perspective on its impact is relatively simple. This paper introduces two variables, digital finance and financial flexibility, from the

internal and external environment, to analyze their impact on the R & D in- vestment of technology-based SMEs; 2) Technology-based SEMs have become an important force to promote economic development, but at present, few re- search perspectives focus on technology-based SEMs. This study enriches the research in this field and provides a reference for improving the R & D capacity of technology-based SEMs; 3) The impact of digital finance on enterprise inno- vation based on the life cycle perspective is less. The heterogeneity analysis based on the life cycle and regional perspective provides references for the develop- ment of enterprises' R & D investment at different stages.

The structure of the article is as follows: This chapter analyzes the research background and purpose, and the second chapter sorts out the relevant theories and puts forward the hypothesis of this article on this basis; Chapter 3 introduc- es the data source, variable selection and model setting of this study; Chapter 4 uses fixed effect model to empirically test the analysis of this paper and make a robustness analysis; Chapter 5 further discusses the heterogeneity of this study based on the life cycle perspective and regional perspective; Finally, Chapter 6 gives the conclusion and countermeasures.

2. Theoretical Analysis and Research Assumptions

2.1. Digital Finance and R & D Investment of Technology-Based SMEs

The point of view of functional finance theory points out that a good financial system helps to optimize the allocation of economic resources across time and space. The existing literature shows that the innovation activities of enterprises are affected by fiscal and tax policies, market reform, financial environment and other factors at the macro level, and the continuous optimization of the external environment can promote the R & D investment of technology-based enterprises (Li & Wang, 2021; Habib & Hasan, 2015; Sun, 2021). Meng Weifu also pointed out that the optimization of the external financing environment will promote the change of the subject's concept and guide enterprises to develop innovative business (Meng & Liu, 2021).

Digital finance is a new generation of financial services that combines the In- ternet, big data and other technologies with the financial industry. On the one hand, the unbalanced supply of resources left by traditional financial institutions and the financial market makes the funding needs of technology-based SMEs un- met. Digital finance broadens the breadth of financial coverage and provides a fi- nancing platform for technology-based SMEs; On the other hand, digital finance uses its own big data platform to accurately screen massive data at a lower cost, monitor the progress of innovation projects of the applicant enterprises through cost and regulatory advantages (Berg et al., 2020), and reduce the hidden risk of adverse selection through the comprehensive collection of information, increase innovation investment and improve the depth of use of digital finance by easing the financing constraints of technology-based SMEs. At the same time, digital transformation can promote SMEs to improve operational efficiency, and improve the level of innovation. Based on this, the hypothesis 1 of this paper is proposed:

H1: The development of digital finance can enhance the innovation input of technology-based SMEs.

2.2. Financial Flexibility and R & D Investment of Technology-Based SMEs

Many internal factors such as management's decision-making power, corporate governance, financial flexibility and so on can have an impact on the innovation management of enterprises. According to the financing priority theory, equity financing will increase the financing cost of enterprises, spread the bad

business information of companies, and enterprises are more inclined to endogenous fi- nancing under general conditions. Relevant research shows that financial flex- ibility can provide a basis for internal financing of enterprises. The R & D in- vestment of enterprises with strong financial flexibility will increase significantly. Financial flexibility refers to the ability to consider the idle funds and liabili- ties of an enterprise and analyze whether it can adapt to changes in the economic environment and take advantage of investment opportunities. The measurement

of cash capacity is mainly reflected in the comparison of cash flow revenue and expenditure. When the enterprise's income cash flow is greater than the cash required for payment, it shows that the enterprise has surplus cash to deal with emergencies, so that it has better cash reserves for R & D investment. Generally speaking, it is unwise for an enterprise to rely solely on equity financing, which makes it unable to obtain the advantages of debt financing, and excessive debt will lead to financial risks, so it is necessary to keep the debt at a reasonable level. Maintaining appropriate financial flexibility is a necessary condition for enter- prises to use financial leverage flexibly. At the same time, enterprises with finan- cial flexibility can use the retained debt capacity to finance externally in order to support the capital required for innovation activities (DeAngelo & DeAngelo, 2007). Based on this, this paper proposes Hypothesis 2:

H2: Financial flexibility is significantly positively correlated with innovation input of technology-based SMEs.

2.3. Financial Flexibility Adjusts the Relationship between Digital Finance and Corporate R & D Investment

The development of digital finance has placed technology-based SMEs in a situ- ation where opportunities and risks coexist. On the one hand, due to the charac- teristics of the digital industry and insufficient financial supervision, some digi- tal financial institutions use their own conditions to commit financial fraud, ag- gravating the instability of the financial market. The confidentiality of innovative research and development is also high, which poses a serious threat to the in- formation security of technology-based SMEs. On the other hand, due to the differences in financial environment and financial infrastructure, even if enter- prises in areas with limited financial resources conduct financing through online channels, it is difficult to give full play to the scale advantages and innovation effects of digital finance (Gomber et al., 2018).

Therefore, the internal financial reserves and planning of technology-based SMEs are particularly important. As enterprises become more sensitive to changes in the external environment, more and more technology-based SEMs have put reasonable reserves of their own internal funds on the agenda, and their management has become more mature. When external financing cannot act as a driving force for enterprise R & D, enterprises with higher financial flexibility will be more capable of raising and mobilizing funds to provide sufficient finan- cial support for R & D innovation. Relevant studies have shown that financial flexibility plays a role between corporate innovation and zero-leverage strategy (Denis & McKeon, 2012), and there is also a significant moderating effect be- tween internal control quality and corporate innovation management. When the external financial environment is good, the internal financial flexibility man- agement will play a "supplementary" role while the technology-based SMEs ob- tain external financing; on the contrary, when the external financial environ- ment is not ideal, it is more difficult to carry out innovative activities through external financing, the internal financial flexibility management will play a "fo-reseeing" role. Based on this, this paper proposes Hypothesis 3: H3: Financial flexibility plays a moderating role in the effect of digital finance on the R & D investment of technology-based SMEs.

3. Study Design

3.1. Sample Selection and Data Sources

In order to ensure the authenticity, continuity and easy availability of the re- search data, combined with the research objects, and referring to Xiao Xiang in his research on the selection of samples of technology-based SMEs (Xiao et al., 2022), this paper selects the 2013-2020 China Growth Enterprise Market Listed company data. The enterprise level data is from CSMAR, and the digital finan- cial level data is from the website of the Digital Finance Research Center of Pek- ing University. The data screening is as follows: due to the particularity of finan- cial data of financial enterprises, listed financial enterprises are excluded; since the consistency of financial data of ST enterprises cannot be guaranteed, non-ST enterprises are selected as samples; the microscopic variables were processed by 1% and 99% WINSOR, and 3216 observations were obtained. Then use EXCEL, SPSS, STATA software to process the data.

3.2. Definition of Main Variables

3.2.1.Core Explanatory Variable: Digital Financial Environment (DIF)

It is measured by the Peking University Digital Financial Inclusion Index and analyzed from three dimensions: coverage ratio (COV), depth of use (DEP) and digitization (DIG). This paper matches the prefecture-level city data of the fi- nancial index with the office addresses of listed companies to represent the digi- tal financial environment of companies.

3.2.2. Explained Variable: Enterprise R & D Investment (Input)

There are usually two methods for evaluating the R & D investment of enter- prises. One is measured by the ratio of R & D investment to total assets, and the other is measured by the ratio of R & D investment to operating income (Mura & Mariamileresa, 2010). In this paper, in the empirical research, the second me- thod is used to measure, and the first method is used in the robustness test.

3.2.3. Adjustment Variable: Financial Flexibility (Fin)

There are generally three methods for measuring financial flexibility. First, single indicator measurement, the most widely used indicator is cash holdings; The second is the combination of double indicators, specifically the combination of financial leverage and cash holding level; The third is the comprehensive mea- surement of multiple indicators. This paper constructs an indicator system as shown in **Table 1** from three levels: cash, leverage and financing costs.

3.2.4. Control Variables

This paper selects control variables from two levels of company operation and corporate governance. The specific indicators are shown in **Table 2**.

Table 1. Enterprise financial flexibility test.

target	first-level indicator	Secondary indicators	measurement method
financial flexibility	cash indicator	Cash holdings	(Money Funds + Trading Financial Assets)/Average Total Assets

Cash Dividend Coverage Multiple

Net operating cash inflow per share/cash dividend per share

Leverage

Reinvested Cash Ratio Net cash flow from operating activities/(fixed assets + long-term investment + other funds + working capital)

Unused Debt Capacity 1-Asset-liability ratio

Indicator

Long-term gearing ratio

Interest-bearing debt ratio

Non-current liabilities/(non-current liabilities + shareholders' equity)

(Short-term borrowings + long-term borrowings due within 1 year + long-term borrowings + bonds payable + interest payable)/liabilities

Financing Cost Indicator

Z-score Z = 1.2M1 + 1.4M2 + 3.3M3 + 0.6M4 + M5, where, M1 = working capital/assets; M2 = retained earnings/assets; M3 = earnings before interest and taxes/assets; M4 = market value/book value of liabilities; M5 = sales revenue/assets

Source: Based on the research results of scholars and the theoretical assumptions of this paper.

Table 2. Control variables.

category variable name symbol measurement method

Company operations

Corporate Governance

enterprise size Size Total assets log

business age Age Ln (1 + years of listed companies) corporate profitability

Nps Net profit/operating income

business growth Growth (Total operating income of the current period " total operating income of the previous period)/total operating income of the previous period enterprise risk level

Lev Total liabilities at the end of the year/total assets at the end of the year ownership

concentration Owner Sum of shareholding ratio of top ten shareholders

equity balance Bal Whether the top ten shareholders are related (existence = 1; others = 0)

Two-weight separation ratio Separ

The difference between the control right and ownership of the listed

company owned by the actual controller Work of Independent Directors

Indep Statistics on the consistency of working places of independent directors and listed companies (consistency = 1; others = 0)

Integration of two positions Interg Concurrent positions of chairman and general manager (yes

= 1; others = 0) Source: Control variables selected from current research.

3.3. Model Settings

In order to examine the impact of digital finance and financial flexibility on the R & D investment of technology-based SMEs, a benchmark regression model of formulas (1) and (2) was constructed. In order to test whether financial flexibili- ty plays a moderating role between digital finance and corporate R & D invest-

ment, the regression model of formula (3) is constructed.

$$Input_{it} = b_0 + b_1 DIF_{it} + b_2 Controls + åYear + åIndustry + e_{it}$$

$$Input_{it} = b_0 + b_1 Fin_{it} + b_2 Controls + åYear + åIndustry + e_{it}$$

$$Input_{it} = b0 + b1 DIF_{it} + b2\ Fin_{it} + b3 DIF^{*}\ Fin_{it} +$$

$$+ b_4 Controls + åYear + åIndustry + e_{it}$$

3.4. Model Selection

This paper first conducts the Hausman test on the sample data. The results show that "prob > chi^2" is significant at 1%, indicating that the null hypothesis is re- jected, so a fixed-effects model is selected. Secondly, by testing the correlation of variables, the results show that the correlation coefficients between the variables are less than 0.7, indicating that there is no problem of collinearity.

4. Empirical Analysis

4.1. Descriptive Statistics and Correlation Analysis

Descriptive statistics of each variable are shown in **Table 3**. It can be seen that the average value of innovation investment is only 7.14%, and the maximum and minimum values are 32.2% and 0.45%, respectively, which indicates that the in- novation investment level of technology-based SEMs is generally not high, and the differences between enterprises are large. The overall average level of digital finance and its three dimensional variables is good, but there are also regional differences. Among the control variables at the corporate governance level, the ownership concentration ratio has a large difference in the sample among groups but the average value is high, indicating that the shares of enterprises are generally concentrated in the hands of the top ten shareholders; The mean value of the separation rate of two weights is low but has prominent values, and the mean value and standard deviation of other variables are at the median level. The standard deviation of the control variables at the company's operation level

Table 3. Descriptive statistics.

variable	size	mean	sd	min	max	variable	size	mean	sd	min	max
Input	3216	7.142	5.667	0.450	32.20	interg	3216	0.432	0.495	0	1
DIF	3216	228.4	42.90	131.9	303.0	indep	3216	0.578	0.494	0	1
COV	3216	226.5	40.14	122.9	290.3	age	3216	2.313	0.278	1.609	2.639
DEP	3216	226.3	53.37	123.2	325.7	size	3216	21.26	0.817	19.66	23.55
DIG	3216	238.8	50.72	144.6	329	growth	3216	0.232	0.375	-0.469	1.935
owner	3216	61.63	12.95	29.33	98.40	nps	3216	0.103	0.187	-1.074	0.433
separ	3216	2.978	5.750	0	24.48	lev	3216	1.114	0.502	-0.0196	4.276
bal	3216	0.773	0.419	0	1	Fin	3216	-0.00199	0.473	-1.240	1.640

Source: according to the running results of the stata software on the samples.

4.2. Benchmark Regression Analysis of the Effect of Digital Finance on Corporate Innovation Investment

The test of the impact of digital finance on innovation input of technology-based SMEs is shown in columns (1)-(4) of **Table 4**. Column (1) shows that the impact of digital finance on enterprise innovation input is positive, and the correlation coefficient is 0.049, passing the 1% significance test, indicating that the improvement and optimization of digital finance as an external financial environ- ment will play a positive role in promoting the innovation input of technolo- gy-based SMEs. Columns (2)-(4) are tested from the three dimensions of digital finance. It can be seen that the three dimensions of digital finance have a positive impact on innovation investment, among which coverage is the most obvious, indicating that the innovation investment of technology-based SMEs is affected by the external financial environment in many ways. The lower the concentra- tion of equity and the higher the separation rate of two rights, the more benefi- cial to the innovation activities of SMEs, thus avoiding the behavior of large shareholders who use their power to seek benefits and reduce the innovation ef- ficiency of enterprises. The higher the degree of integration of two roles, the more innovative enterprises will be because they can better allocate the resources of enterprises to serve the innovation activities. The longer the enterprise is, the more resources it can accumulate for innovation activities; The smaller the size of the enterprise, the more investment in innovation, which further illustrates the characteristics of technology-based SMEs; The growth and risk of enterprises have a negative effect on R & D investment, while the profitability has a positive effect. That is, after rapid growth, enterprises do not have enough power to sup- port R & D activities. The stronger the profitability, the higher the net operating profit rate, the enterprises have enough funds to engage in R & D activities. To sum up, the hypothesis 1 that digital finance can enhance enterprise innovation investment has been verified.

4.3. Benchmarking and Moderating Effects of Financial Flexibility on Innovation Input

The test results of the impact of financial flexibility on innovation input of tech- nology-based SMEs are shown in column (5) of **Table 4**. The impact of financial flexibility on innovation input is significantly positive at the level of 1%, and the correlation coefficient is 2.812, indicating that, except for the external digital fi- nancial environment, the internal financial reserves and planning of technolo- gy-based SMEs have a positive role in promoting innovation input. In addition, by comparing the correlation coefficient, it can be found that compared with digital financial variables, financial flexibility has a stronger impact on enterprise innovation investment, which indicates that in the more complex activity of in- novation, technology-based SEMs have limited external financing for various reasons, internal financial planning is more important, and the external economic

Table 4. Regression results.

	(1)	(2)	(3)	(4)	(5)	(6)
	DIF	COV	DEP	DIG	Fin	Fin (mo)
DIF	0.049***					0.049***
	(9.44)					(9.75)
COV		0.041***				
		(10.44)				
DEP			0.021***			
			(5.04)			
DIG				0.015**		
				(2.19)		
Fin					2.821***	
					(12.66)	
DIF*Fin						0.009**
						(2.05)
owner	−0.030***	−0.031***	−0.027***	−0.026***	−0.025***	−0.028***
	(−3.48)	(−3.65)	(−3.20)	(−3.07)	(−2.99)	(−3.37)
separ	0.031**	0.038**	0.022	0.023	0.028*	0.036**
	(2.05)	(2.50)	(1.41)	(1.47)	(1.88)	(2.43)
bal	−0.292	−0.267	−0.304	−0.329	−0.369*	−0.365*
	(−1.33)	(−1.22)	(−1.37)	(−1.48)	(−1.70)	(−1.72)
interg	0.393**	0.370**	0.496***	0.574***	0.568***	0.383**
	(2.19)	(2.07)	(2.74)	(3.17)	(3.22)	(2.20)
indep	0.191	0.137	0.456**	0.645***	0.637***	0.179
	(0.99)	(0.71)	(2.36)	(3.39)	(3.44)	(0.95)
age	1.112**	1.131**	1.061**	1.053**	−0.123	−0.077
	(2.43)	(2.48)	(2.29)	(2.27)	(−0.27)	(−0.17)
size	−0.890***	−0.898***	−0.850***	−0.814***	−0.277**	−0.330**
	(−6.57)	(−6.65)	(−6.21)	(−5.93)	(−1.98)	(−2.38)
growth	−1.328***	−1.374***	−1.312***	−1.342***	−0.879***	−0.871***
	(−5.32)	(−5.52)	(−5.19)	(−5.29)	(−3.52)	(−3.54)
nps	2.377***	2.432***	2.365***	2.458***	−0.665	−0.828
	(3.60)	(3.70)	(3.55)	(3.67)	(−0.95)	(−1.21)
lev	−1.123***	−1.099***	−1.219***	−1.289***	−0.808***	−0.663***
	(−6.02)	(−5.90)	(−6.47)	(−6.83)	(−4.31)	(−3.58)

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source: according to the running results of the stata software on the samples.

environment is stable in most cases, which is "inclusive" for all enterprises. At this time, the enterprise's internal "particularity" and risk prevention and toler- ance will play an important role in its R & D investment. Therefore, hypothesis 2 is verified.

This paper uses a regression model with a product term to test whether finan- cial flexibility has a moderating effect between digital finance and technolo- gy-based SMEs' innovation investment. The results are shown in column (6) of **Table 4**. The interaction term DIF * Fin is significantly positive at the 5% level, and the

correlation coefficient is 0.009, indicating that financial flexibility has a positive moderating effect. It can be seen that while technology-based SMEs rely on external finance to carry out innovation activities, the accumulation of inter-nal financial flexibility funds will play a "supplementary" or "foreseeing" role in the innovation activities of enterprises to a large extent. Hypothesis 3 is verified.

4.4. Robustness Test

The above model test controls the year and industry effects, but there may be some missing variables at the individual level. Therefore, the fixed effects at the individual level are controlled and tested again. The results are shown in column

(1) of **Table 5**. After controlling the fixed effect at the individual level, the esti- mated coefficient of the impact of digital finance on enterprise innovation input is 0.019, passing the 10% significance test. The robustness test adopts the re- placement variable method. The results of replacing R & D input variables are shown in columns (2)-(4) of **Table 5**, which are consistent with the empirical analysis results in this paper.

5. Further Analysis

5.1 Heterogeneity Analysis from the Perspective of Life Cycle

According to Li Yunhe's criteria for the division of enterprise life cycle (Li et al., 2011), the sample enterprises are divided by using the three-way method to as- sign values to the four variables, namely, sales revenue growth rate, capital ex- penditure rate, retained earnings rate and enterprise age. The test results are shown in **Table 6**. The impact of digital finance and financial flexibility on the R

Table 5. Robustness test results.

	Input		Input*	
	(1)	(2)	(3)	(4)
DIF	0.019*	0.0002***		0.0002***
	(1.76)	(10.13)		(10.18)
Fin			0.003***	
			(3.18)	
DIF*Fin				0.00004**
				(2.30)
Constant	2.190	0.099***	0.113***	0.088***
	(0.36)	(8.45)	(9.44)	(7.32)
Company FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	3216	3216	3216	3216

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source: according to the running results of the stata software on the samples.

Table 6. Regression results of life cycle heterogeneity.

	Input								
	Growth period			Mature period			Recession period		
DIF	0.035***		0.033***	0.056***		0.056***	0.048***		0.051***
	(3.34)		(3.19)	(7.98)		(8.30)	(4.03)		(4.29)
Fin		2.187***			3.599***			1.510***	
		(5.49)			(11.44)			(3.49)	
DIF*Fin			0.010			0.012**			−0.002
			(1.06)			(2.00)			(−0.15)
Constant	25.639***	26.016***	21.285***	13.962***	8.451**	0.803	12.527	12.372	10.711
	(4.46)	(4.69)	(3.73)	(3.23)	(1.97)	(0.19)	(1.58)	(1.55)	(1.37)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	870	870	870	1899	1899	1899	447	447	447

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source: according to the running results of the stata software on the samples.

& D investment of technology-based SMEs is significantly positive at the level of 1% in all three life stages, and the effect is more obvious in the mature stage. For enterprises in the mature period, financial flexibility has a significant moderat-

ing effect, but it has no moderating effect on enterprises in the growth and re- cession periods, and has a negative correlation with the effect in the recession period.

Specifically, technology-based SEMs have developed rapidly in the growth pe- riod, pursuing economies of scale, and are strongly constrained by financing, so there is a large gap in enterprise financing. Digital finance provides possibility for external financing of enterprises through advanced technology and weakening information asymmetry of enterprises. At this time, the internal cash re- serves of the enterprise may only meet the current needs to support R & D in- vestment, while the internal and external resource coordination for the enter- prise to carry out innovation activities has not been considered, so there is a result that the financial flexibility itself is significant and the regulatory role is not significant. Mature technology-based SMEs have not only achieved some achievements in innovation, but the profits accumulated by these achievements have brought sufficient cash flow to the enterprise. Looking for external financ- ing under the current state, the accumulation of internal cash makes the finan- cial flexibility of the company more abundant at present and in the future, and for companies that are seeking new profit growth points at this time, their R & D investment must also be sufficient. After entering the recession period, the financial deterioration of enterprises leads to bankruptcy risk. The financial flex- ibility has shown a negative regulatory effect between the external financial en- vironment and R & D investment. The possible explanation is that technolo- gy-based SMEs no longer have the ability to innovate.

5.2.Heterogeneity Analysis from the Perspective of Region

Due to the regional differences in China's economic development level, the ex- ternal infrastructure conditions that digital finance relies on have significant ad- vantages in the eastern region. As shown in **Table 7**, the

impact of digital finance on R & D investment of technology-based SMEs is significantly positive correlated at the level of 1% in the eastern and central regions, but not significant in the western regions; The impact of financial flexibility on R & D investment of enterprises is significantly positive correlation in the eastern and western re- gions; the moderating effect of financial flexibility only passes the 5% signific- ance test in the eastern region.

Specifically, the eastern region has a better digital development relying on the advantages of economy, location and infrastructure, which makes digital finance a high substitute for traditional finance; In addition, there are a large number of technology-based SEMs. Driven by the competitive power, they have a high de- mand and enthusiasm for innovative activities. Compared with the eastern re- gion, the innovative financing of enterprises in the central region mostly de- pends on the external digital financial environment. The possible explanation is that the rapid development of digital finance makes many enterprises want to take the "tailwind" of external financing, so R & D investment mostly comes from external financing. However, due to the immaturity of enterprise development and

Table 7. Regression results of regional heterogeneity.

	Input								
		Eastern region			Central region			Western region	
DIF	0.047***		0.047***	0.086***		0.085***	0.018		0.028
	(7.39)		(7.57)	(6.52)		(6.46)	(0.67)		(1.14)
Fin		2.773***			0.738			4.157***	
		(10.96)			(1.31)			(5.27)	
DIF*Fin			0.010**			0.010			−0.008
			(2.04)			(0.88)			(−0.54)
Constant	19.212***	14.256***	7.828**	12.774**	17.700***	11.722*	5.387	3.338	1.619
	(5.30)	(3.93)	(2.13)	(2.03)	(2.66)	(1.82)	(0.44)	(0.30)	(0.14)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	2548	2548	2548	417	417	417	251	251	251

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source: according to the running results of the stata software on the samples. insufficient attention to internal financial reserves, financial flexibility naturally did not play an active role in regulation. Due to the weak level of local economic development and low coverage of digital infrastructure, the impact of digital finance on enterprises' R & D investment in western China is not significant. However, under the constraint of external financing, enterprises can attach im- portance to internal financial planning. But due to the lack of effective coordina- tion and cohesion between the internal and external, and the constraints of their own economic development, financial flexibility plays a negative role in the reg- ulation, but it is not significant.

6. Conclusion and Enlightenment

Based on the financial data of listed companies on the Growth Enterprise Market from 2013 to 2020, this paper conducts an empirical study on the relationship between digital finance, financial flexibility and R & D investment of technolo- gy-based SMEs, and draws the following conclusions: 1) Digital finance has a

positive effect on R & D investment of technology-based SMEs; 2) Financial flexibility has a positive effect on the innovation input of technology-based SMEs, and plays a positive regulatory role between digital finance and enterprise R & D investment; 3) Digital finance has a positive effect on R & D investment of enterprises in different life cycles, which is more effective in the mature period, but the regulatory role of financial flexibility is heterogeneous for enterprises in different life cycles; 4) The impact of digital finance on enterprise innovation investment is heterogeneous among regions, but not significant in the western region; The impact of financial flexibility on enterprise innovation input is not significant in the central region, and there is also heterogeneity among the three regions.

The conclusions of this paper have the following policy implications: 1) We should steadily promote the development of the external digital financial envi- ronment, promote a more effective balanced flow of financial resources among regions, improve the financial hardware facilities and networking construction in underdeveloped regions, weaken the digital financial development gap be- tween regions, and provide good financing conditions for the innovative invest- ment of technology-based SMEs; 2) Technology-based SEMs should maintain a reasonable matching level of cash, debt and external financing capabilities to ensure that enterprises can quickly and cheaply obtain adequate financial re- sources when responding to external emergencies and strategic adjustments. They should develop flexible financial policies and budget management levels by ensuring reasonable financial flexibility to improve their ability to deal with risks; 3) Pay attention to the coordination of internal and external resources. The R & D investment of technology-based SMEs should not only give play to the conditions brought by external financial resources, but also play the role of their own financial flexibility. The two should cooperate to predict and perceive the combination of resources, so as to better play a supporting role in innovation ac- tivities; 4) The government should vigorously develop a multi-level capital mar- ket, so that enterprises at different stages of development can obtain the re- sources needed for innovation activities, enhance enterprise value under the role of innovation, and open up new paths for enterprise operation.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this pa- per.

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Innovation Strategy for Business: Financial Management Aspects

Dr.Chinmaya Kumar Rout

Abstract: Nowadays business is risk-oriented and profit-oriented market activity, the mean of functioning in a market environment, at the same time conditioned by the specifics of a certain branch of the economy. Entrepreneurship is an integral part of the business, its innovative element. Innovation in business is the driving force of economic growth under unstable conditions of the present, requiring rapid adaptation to the dynamic changes of the socio-economic and political situation in Ukraine and abroad. The critical problem of innovation efforts enhancing is the absence of a proper innovation strategy concerned with financial risk and scarce financial capital. Moreover, the market is a stimulus for business development, and the shortage of financial resources (equity and debt) is its limit. In this article, we explore an essence and the role of the innovation strategy for business and its financial management aspects. We argue that the effectiveness of innovation activity depends, above all, on management effectiveness. There are a number of managerial tasks arise coming from peculiarities of innovative projects. The financial management is a key component of the management system of innovation strategies for business, which is very important for ensuring business efficiency under current market conditions. It plays the role of an important means of competition and maintaining a leading position in the markets of goods and services. A timely financial risk assessment of business and the capital structure formation for an innovation strategy are the main prerequisites for ensuring effectiveness. We offer a concept of the innovation strategy for business and, in particular, its financial management aspects.

Keywords: business, entrepreneurship, financial management, financial resources, financial risk, innovation, innovation strategy.

Introduction: Obviously, sustainable development and efficiency of modern business are impossible without actuation its innovation activity. Innovation in business is the driving force of economic growth under changing and unstable conditions of the present, requiring rapid adaptation to the dynamic changes in the socio-economic and political situation in Ukraine and abroad. It stimulates the emergence of new needs and, consequently, new products, production costs reduction, activation of investments inflow, increasing the business potential, increasing the image of business, finding new market niches both at the national and international level. Therefore, an innovation strategy for business is the source of competitive advantages. They help to create competitive, innovative and well-known goods and services in different sectors of the economy. Moreover, it is a prerequisite for sustainable development and a high level of profitability of the domestic business.

At the same time, the effectiveness of innovation activity depends, above all, on management effectiveness. There are a number of managerial tasks arise coming from peculiarities of innovative projects (long payback period and significant volumes of investments, a wide alternatives range of financial and organizational-legal support of business, the need to take into account the life cycle of innovations, the ratio assessment of

the profitability and risk, etc.)There are planning and forecasting for the medium- and a long-term prospect with discounting of cash flows, budgeting; capital structure optimization; valuation of financing cost and their effectiveness in the implementation of innovative business strategies; assessment of risks from an implementation of innovative business strategies and, especially, financial risk, etc.

Mentioned issues are significant for the determination of the role and importance of financial management as one of the critical components of the system of innovation strategies management for business. It determines the relevance of the issue.

Problem statement. Many Ukrainian and foreign scientists studied theory and methodology of business and its innovation strategy, in particular, such as L. Abalkin,

V. Alexandrova, A. Amosha, L. Antonyuk, N. Antonyuk, I. Balabanov, Y. Bajal, N. Bonnington, B. Carloff, M. Chumachenko, A. Chukhno, N. Dobrova, P . Drucker, L. Fedulova, K. Freeman, A. Galchinsky, G. Goldstein, M. Gohberg, V. Hartman, V. Heyets,

S. Ilyenkov, S. Illyashenko, N. Krasnokutska, F. Nixon, G. Osovska, A. Peresada, V. Polivchak, M. Porter, S. Rozenstblatt, A. Savchenko, V. Savchuk, J . Schumpeter, V. Terekhov, A. Thompson, B. Twis, M. Yokhne, L. Zakharkina, V. Zombart, and others.

However, comprehensive research of the financial management of innovative strategies for business is currently lacking in Ukrainian economic science.

The purpose of this research is to investigate the essence and role of the innovation strategy for business and its financial management aspects under modern unstable socio- economic conditions.

Results of the research. It should be said, that today business is considered the most active form of economic activity. The etymological meaning of a concept of "business" is activity, occupation. However, in our opinion, the essence of this term is substantially deeper.

Firstly, we should agree with P. Drucker, who considers that the essence of a business is outside itself [1]. It means that the main purpose of business is to create a consumer. Moreover, the most important business priority is to meet the needs of their customers, and only then, a business can fulfill its main mission of returning stable profits to its owners.

R. Bonnington, B. Nidls and S. Rosenblatt note that business is a system of conducting a business; it is the creation of products, which people need; it is the system, we created to meet our desires; it is a central backbone in our social and economic system; it is the way we live [2].

V. Polivchak considers that the system of Ukrainian business is a complex dynamic system of business relations, which covers the commercial and non-commercial aspects of targeted human activity in the production, exchange and consumption of material goods, and based on a close combination of the subsystem of material goods (goods and services) and subsystems of business entities [3]. However, the business is a broader concept than entrepreneurial activity, since business involves the implementation of any one-time commercial transactions in any field of activity that are aimed at earning income. Therefore, business covers the relationships that arise between all market economy participants and entails not only entrepreneurs, but also consumers, hired workers, and government structures. At the same time, we emphasize, that there

is no business without entrepreneurship. Entrepreneurship is not only an element of the business system but also a factor in its development.

It should be said, that firstly the term "entrepreneur" was proposed by English economist R. Cantillon, who considered entrepreneurship as special economic function, which is always connected with risk element [4]. A. Smith defined the entrepreneur as the owner of the capital, which, in order to the commercial idea and profit, goes to the economic rhythm [5]. Furthermore,

A. Marshall equated entrepreneurship with management and emphasized the innovative moment in this context [6]. Similar J. Schumpeter noted that innovation is the brainchild of entrepreneurship; the entrepreneur is the creator of innovation; the entrepreneurship is a force operating on the market, and an ability to create new products and business models [7]. Besides, modern business is dynamic. If there is any single word that can best describe today's business, it is changing. This change makes the companies spend substantially on Research and development to survive in the market [8].

So, innovation is a special tool of entrepreneurship, the activity that gives resources a new opportunity to create wealth [1]. Despite the fact, that in many cases innovation is the basis of entrepreneurship and the source of its competitive advantages, entrepreneurship is just one of the possible ways of practical implementation of innovations in the markets of goods and services.

Generally, we share ideas shown above and consider that business is risk-oriented and profit- oriented market activity, the mean of functioning in a market environment, at the same time conditioned by the specifics of a certain branch of the economy. Entrepreneurship is an integral part of the business, its innovative element. Moreover, innovation is possible in all aspects of conducting business. The market is a stimulus for business development, and the shortage of financial resources (equity and debt) is its limit.

It should be said, that the implementation of innovations takes place through the use a set of methods and tools, that cause large and small changes in processes, products and services, and make something new in the business. It ultimately increases the importance of the business for its customers and contributes to the appropriate accumulation of experience and knowledge [9]. Business innovates in several ways: by small steps of modification and improvement; by more substantial steps by making significant improvements and updates to their products and services; and, rarely, by attempting radical innovation using revolutionary technology or entering unknown markets [10]. However, change, as a result of the innovation process, is strongly influenced by how organizations define the concept of innovation. This fact highlights many critical implications for organizations and creates a new order for the management of innovation [11]. In this context, it is important to emphasize that a company's ability to support product and process innovation is no longer adequate, and the third type of innovation is a strategy innovation, needs to be introduced in order to provide further support [12]. This type of innovation specifically emphasizes the importance of a longer-term view of the contribution of innovation towards competitiveness and success as a company.

All innovations are characterized by a certain degree of uncertainty; at the same time, the probability of risk varies depending on the type of innovation, etc. (for example, radical innovations are more expensive and more likely to fail. Therefore, there should be a lot of options and ideas in the business (most of them will not be implemented in practice) to be able to choose those special ones that can potentially turn into new

proposals and improvements [10]. Despite massive investments, innovations are likely to fail in many companies, and even successful innovators are often disappointed and have a hard time sustaining their innovation [13]. Thus, the problem with innovation improvement efforts is rooted in the lack of an innovation strategy.

G. Pisano notes that a strategy is a complex of coherent, mutually reinforcing behaviors or policies aimed at achieving a specific goal. Moreover, without an innovation strategy, attempts to introduce innovation can become a grab bag of much-touted practices [13]. Business without an innovation strategy will not be able to choose the optimal variants and make trade-off decisions.

Generally, we share the idea, that a strategy is a match between what a company can do within the given environmental circumstances. The company's capabilities are considered as its strengths and weaknesses, while the environmental circumstances are considered as external opportunities or threats [14]. Furthermore, a strategy can be represented as the determination of the mail long-term objectives and goals of a company, and the adoption of solutions, how to act and allocate resources, necessary for carrying out of them [15].

In our opinion, an innovation strategy for business is both a complex plan and a decision framework, which includes alternative variants of business activity for a long-term perspective, depending on the risks, available resources and expected returns for different types of innovations in order to achieve strategic business objectives.

The goal of an innovation strategy is to ensure the optimal plan and resource allocation in order to achieve the company's corporate objectives, to help decide when and how to selectively abandon the past in order to focus on the future business [16]. Besides it, an innovation strategy helps firms decide in a cumulative and sustainable manner, about the type of innovation that best match corporate objectives, guides decisions on how resources are to be used to meet a firm's goals for change and thereby deliver value and build competitive advantage [17]. At the same time, the process of developing and implementing an innovation strategy is associated with high risks (financial, market, technological, organizational, production, etc.).

Thus, S. Illyashenko considers that the innovative strategy at the business level involves analyzing the portfolio of innovative projects, researching the market positions of the enterprise and identifying the priority directions of its innovation development [18]. However, in our opinion, there must be one important component of an innovation strategy for business – financial management (Figure 1).

Obviously, finance plays a critical role in the innovation process. This requires a delicate balancing between managing risks without allowing this to blunt innovation. In essence, it requires finance to:

1) support innovations by providing analytical insight at both the strategic and detailed levels across the whole organization;

2) provide an objective viewpoint and inject realism into discussions;

3) rely on the facts and structured analysis to support decision making;

4) understand the financial implications of marketing decisions;

5) ensure that there are clear, measurable gates throughout the project;

6) focus on sustainability of innovation (going beyond year one volume);

7) prevent escalation of commitment from clouding judgment;

8) monitor the success of the innovation post launch and provide feedback on performance for future innovation projects [19]. However, this list isn't enough. Moreover, today the limited financial providing is one of the obvious problems.

Conclusions and prospects of further research. Concluding, it should be said, that financial management is a key component of the management system of innovation strategies for business, which has great importance for ensuring business economic efficiency under current market conditions, playing the role of an important tool of competition and maintaining a leading position in the markets of goods and services.

The financial management of innovation strategy for business is the system of functions, methods, and principles that determine the mechanisms and organizational forms of influence on processes, which relate to the provision of capital requirements for innovation strategy for the business and aimed at maintaining the business financial equilibrium.

In our opinion, substantiation of the scientific and systematic approach to the formation of the optimal structure of financial resources needed for realization of the innovation strategy for business is a prerequisite for effective financial management of the innovation strategy for the business. Specific peculiarities of financial management of the innovation strategy for the business case the necessity to optimize the structure of financial resources as a dynamic process based on the risk evaluation of financing of the innovation strategy for the business, considering the effectiveness of the innovation strategy for the business. A timely financial risk assessment of business and the capital structure formation for an innovation strategy are the main prerequisites for ensuring effectiveness.

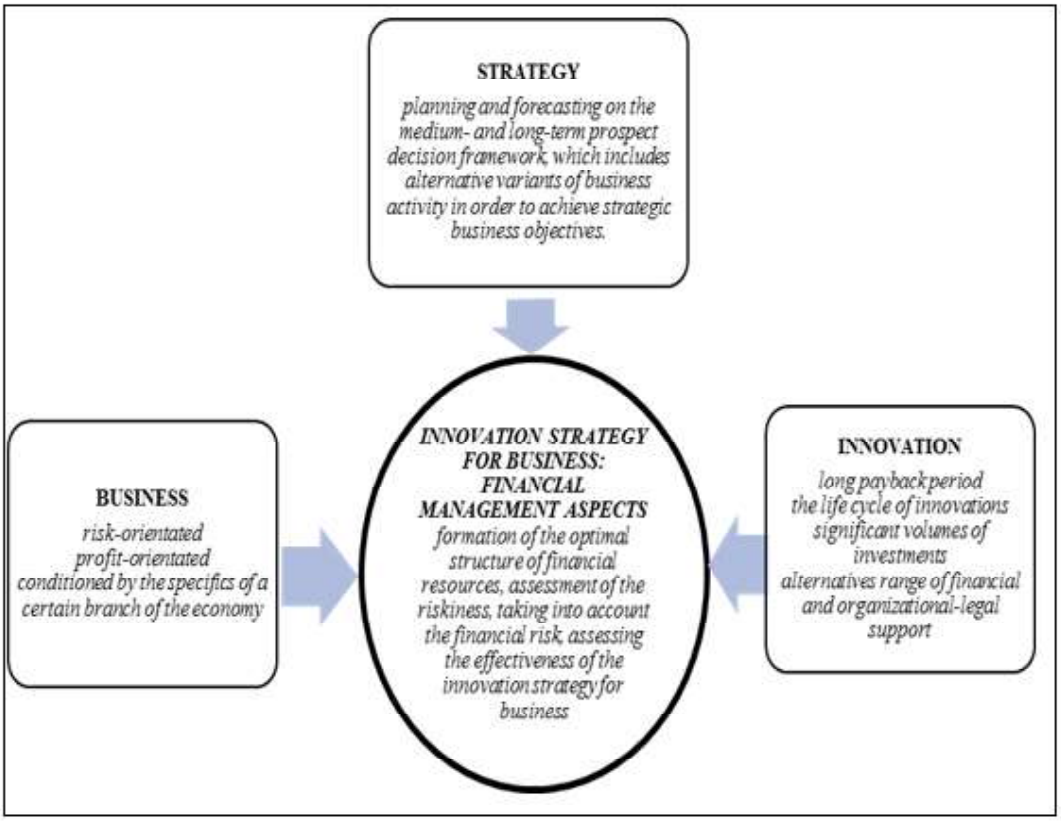

Figure 1. The place of financial management of innovation strategy for business
[Authors' own method]

Effective financial management of innovation strategy for business is an inherent factor in achieving strategic goals and ensuring competitiveness in today's market environment.

Thus, the proposed concept of the innovation strategy for business and, in particular, its financial management aspects should be a part of further research in this scientific sphere.

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îâàð³â ³ ïîñëóã. Ñâîº÷àñíà îö³íêà ô³íàíñîâîãî ðèçèêó á³çíåñó ³ ôîðìóâàííÿ ñòðóêòóðè êàï³òàëó äëÿ ³ííîâàö³éíî¿ ñòðàòåã³¿ º îñíîâíèìè ïåðåäóìîâàìè çàáåçïå÷åííÿ åôåêòèâíîñò³. Çàïðîïîíîâàíî êîíöåïö³þ ³ííîâàö³éíî¿ ñòðàòåã³¿ äëÿ á³çíåñó ³, çîêðåìà, àñïåêò³â ¿¿ ô³íàíñîâîãî ìåõàíiçìó.

Êëþ÷îâ³ ñëîâà: á³çíåñ, ï³äïðèºìíèöòâî, ô³íàíñîâèé ìåõàíiçì, ô³íàíñîâ³ ðåñóðñè, ô³íàíñîâèé ðèçèê, ³ííîâàö³ÿ, ³ííîâàö³éíà ñòðàòåã³ÿ.

JEL Codes: G32, L21, O31, O32 Figure: *1;* References: *19*

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Financial Managers And Financial Innovation

10

Dr.Debabrata Sharma

Abstract: The purpose of innovation is emerged creativity and has come in to practice in other words the innovation means ascertained creative thought. Innovation is producing new services and engaging the mental abilities for creating a new thought or concept. Now days the innovation development is result of group activities and complex versatility among administrative and employees of various organization. The success of any enterprise in area of finance is strongly depends on innovative financial systems and its specifications so because of this reason the innovation in finance area as new approach has become under consideration of owners and manages of most organization. So in this regard the importance and strategic role of financial managers appear very seriously and the challenges that financial manages faced in new century and the expectation of them of knowing modern information of accounting and study of understanding pre requirements and basic knowledge to culture making for understanding the concept of innovative financial manager or financial engineer and growth circumstance of competitive power with help of innovator and creator financial manages have been studied in this article.

Keywords: *Finance, Financial Managers, Innovation, Creativity, Challenges, Decision Making, Financial Engineering*

Introduction

Today he increasing transitions of business environment, quick changes of markets and challenging increase cause that role of innovation become more important in growth and development of business. The innovation that indicator of a new concept and consist of various technical, economical, sociology and psychology dimensions is one of words that several definitions have been produced for it. Generally innovation consists of two main parts, dehiscence of a new idea or invention and converting this idea in to a product, process or useful services for society. According to this general definition the innovation management is complex process that needs to effective ability in planning , coordinating of specialist and innovative individuals , executive structure of organization that financial managers have a serious place and they know very well of need of industry and society .

In present conditions that waves of global financial crisis has put the largest companies in the whole world in very terrible conditions financial manages with innovation and creativity strategy can be used as solving key of escaping from challenging environment as main strategy . On the basis of this strategy the developing of this industry needs to a contiguous system of making use of innovative and creative thoughts .There is belief that the new ideas and innovation as cultural capital in any organization should be used. An effective and productive required investing in research part and making practicable the creativities and it is the choosing of real working goals adapted to market needs that here financial manger with expenses management policy help to the organization in investing in innovation (Peter, 2006).

It is no doubt if any new motion and positive change if be along with efficient planning and continuous pursue in addition to cause for dehiscence of that unit it will affect in other relevant department of organization.

It is no doubt if any new motion and positive change if be along with efficient planning and continuous pursue in addition to cause for dehiscence of that unit it will affect in other relevant department of organization.
So for achieving to this ideal it seems necessary that in any organization after gathering opinion the evidences of innovation and dehiscence be defined clearly in any part of organization so that in addition to strengthening previous positive the other new measures also began in these units.

The financial industry also like other industries has activity for profit determination hence the financial affairs in order to meet the organization's maximization goal should provide a new strategies and practice innovation (Zechariah *et al.,* 210)

In other side nowadays in each institutes including private, cooperative or public whether with profitability or non-profitability purpose financial management perform a principal role. Financial management considered as a scientific filed because financial affairs is set of reality, facts and Principles that related with providing and Applying financial resources through people and business organizations, government, so the innovative and creativity is most important in this part. Since the financial affairs are lifeblood of all activates in any organization and their control and protection is with financial managers, it is quite clear that the matter of control and directing of financial sources and its important role in life of organization has created many expectations from financial managers. So due to all these the role of financial managers has considered very important in recent years. Due to increasing of enterprises need to redesigning of philosophy and policy of management for constant making competition continuation leads to a global enterprise in real meaning. So to have strong team of innovative and creativity financial managers is of numerous advantage that with their beneficial performance will assist the company in challenging with in economic globalization and passing it and also to compete in this new time for achieving the feature of companies.

Therefore to have innovative with creativity thought human resource in financial affairs which is most important department of any organization where individuals in this section have ownership feeling in decision making and are obliged towards its result and also increasing their productivity and efficiency, whereas the top managers of companies can facilitate their experiences to subordinates through training in order to make their decisions rapidly and correctly (Rai and Saidi, 2004).

Innovation Concept

Financial management of organizations have very important role in Administrating of various process of innovation that are as follows:

1. Collecting and sentience of scientific information and convert it to technical knowledge.

2. Innovation and new ideas creation with focus on quality improvement of products, new product invention, betterment of production and services processes.

3. Changing new ideas in to applicable plans and samples.

4. Technical knowledge and plans transmission in to production processes and also in distribution and utilization (Jafari and Kalantar, 2003).

Any of above processes need to particular style and policy. In primary stages that relates to dehiscence

and new ideas creation, challenge in financial management and motivation creation in innovative and initiator individuals in financial affairs that life blood of any leads to dehiscence of useful and effective ideas for developing enterprises and making them to compatible in global economy. Therefore the enterprises for maximization of their profit and competitive products should pay more attention to innovating in financial affairs and have an innovative and empowered team in aforesaid part .This observation in innovation process leads to general statement that any changes in financial environment of companies cause for their movement in to innovation that may have profitability. Since recent decade the individuals and financial institutes that were acting in financial markets faced with fundamental changes in economical environment. Inflation and interest rates in these years have been increased severely and make difficulty in anticipating that demand has been changed in financial markets and rapid progress in computer technology has changed the supply condition. Due to obstructive financial regulations the enterprises perceive that the previous financial methods in their business activities are not profitable any more and products or services that are providing to public can not be sale so they could not to absorb the financial sources with usual and traditional tools. Therefore for their life continuation so they have to

change their policies in financial matter and have modern approach to financial matter so this process called as financial engineering or innovation in financial management.

Innovation Management and the Role of Finance: Status, Challenges

As businesses are engaged more and more in innovation, change will become the standard. This will affect also finance – a support function, which has to react to the new business requirements and has to adapt structures, processes and its service offering accordingly.

On one hand, finance has to become a better business partner that is supporting the business in innovation and growth. On the other hand finance has to become more efficient and also has to deal more and more with external regulations – creating a need for optimizing financial processes and financial control. As a result, some kind of „innovation in finance is required as well. How do CFOs see innovation and their role in it? What are the major building blocks and challenges in transforming finance? (Allan, 2008).

Innovation: Why, and what are the Challenges?

What does successful innovation mean and what are the major challenges?

First of all we have to differentiate between invention and innovation. Invention is different from innovation because innovation includes introducing products successfully into the market.

The objective of innovation is not limited to create technological novelty. We really have to be careful not to innovate just for technology s sake. We have to ensure – and that s the challenge from perspective of many management thinkers that the companies really meet customer requirements in everything they do and that they have the right technology for their customers, that they we have the right solutions for their customers in all of the different industries they are engaged in. And for me this means that we have to enable our customers by providing them with our innovations to successfully master their challenges.

There are two further aspects that would mention with regard to customers. On the one hand, customers expect to help them grow their business. On the other hand, they have to keep costs low and on the IT side this means to reduce their total cost of ownership.

1. We have to look at the innovation process to explain it. It starts with “invention”, then moves through concept development and testing, over to new product development or implementation, which really is “innovation”, then to business development or expansion and finally to what can be called „harvesting . Now, what a company has to think about is: What parts of the process are we good at? And what to believe and this is very simplified, that most large consumer goods companies are excellent at the beginning of the process and again at the end. That means I think we are best in “invention” and in larger scale marketing and Sales. You know we have larger and well funded and equipped research facilities; we have great contacts in the scientific world, and consequently produce innumerous new ideas and innovative concepts. But we often do not succeed as easily in implementation, and only very few of the bright ideas actually become big products. But once a new product has been successfully brought to the market, or purchased through an acquisition, then the qualities show again in full: in better distribution, international expansion, realization of synergies, and finally we harvest the Benefits (Nasimi, 2010).

Now we can shift the perspective a little bit and want to come back to finance. If we consider what has just been said about innovation in general, from the perspective of the business, and if we now think about innovation in finance, change in finance, what can we learn from this? Why does finance has to change at all? Why do we need innovation in finance and how do we organize for it? What are the building blocks of transforming finance, of the finance strategy? And what are the challenges?

First of all, it would be better to emphasize that the finance strategy – and this also includes innovation in finance – must be aligned with and must support the overall strategy of the company. It is not per se a strategy for finance. Bearing this in mind, we then have to think about the role of finance in the organization. It has already been mentioned in the presentations during this roundtable that finance has a dual role: the business partner role, where finance as a business partner supports the business in achieving its business objectives, and the stewardship role, in which the finance function has to safeguard shareholder interests and ensure good corporate governance which includes the paradigm “compliance

without compromise”. It s clear that we need a good balance between both roles. We all know that it can be very difficult to fulfill both roles at the same time (Ali, 2008).

Now the question is how it can work, if you have the right people in the organization and if accountability and responsibility exist for the things the finance organization has to deliver.

Our task as a business partner role as finance people is to support the transformation of the company, the transformation from a product company to a business solutions platform company with a growing focus on the volume business in the mid-market, which will offer for our customers not just single products, but a business process platform that can integrate various services in a flexible way. This allows our customers, for example, to better support innovation from the IT side and it can reduce the total cost of ownership at the same time. And that s a tremendous shift for our organization, for how we go to market in the future, for what we sell to the market, and for all the related areas. And as a consequence, being part of this strategy and in order to be able to support this change in the business, we also have to change within the finance organization. We have to adapt how we operate and we have, for example, to focus much more in the future of really being able to support the business as a true business partner.

When we look at our finance organization, for example in a particular country, then this means for the local

CFO to support the operationalization of our strategy in this country, and thus that the CFO needs to change as well. It especially implies a shift away from transactional processes to be able to focus more on the business partner role. We have to support this by implementing shared service structures around the world in order to free up resources to then better support the business (Rafiyan, 2009).

We do not argue about the stewardship role now. That s something that we have to do any way and in parallel. There can be no compromise on compliance but to act in two very different ways.

The co-pilot role requires that should continuously challenge and drive for innovation. And that means, for example, also to nurture sometimes a spirit of creative destruction. We are trying to live this within the finance& control function at Nestlé. For example, we said, let s consider to stop reporting. While this may be radical thought we stimulated a very positive and creative discussion about how we could turn reporting, which should provide people with relevant information to help them to make better decisions, from a process, which is „pushing a lot of un-relevant information on them, to a process where people

„pull the information they really need – meaning a change from a „push to a „pull mode. But to get to that discussion and to this new concept, I first of all had to destroy the idea that we always will have reporting as we had it. On the other side, in your stewardship role, you have to be concerned at the same time about what Dominic Morehead called in his presentation „guarding the financial peace . It means that you have to innovate but, at the same time, you have to still ensure good financial governance. You have to make sure that your innovation doesn t put your finance&control framework and the financial and operational stability at risk.

So you have to live both roles at the same time, even within finance& control. But with a very different approach, in a very different way. You need both. You do not only want financial peace.

You all fall asleep, if the company would just manage for financial peace and there would be no growth and no competitive strength any more. On the other side, if you would allow too much creativity and innovation, this can also destroy the company. So you have to balance both approaches and both roles. And that it seems, is more of an art than a science.

That we first have to stop doing things, the old things – at least in thinking -, before in order that every organization has to become today a change leader. And he defined some principles for this. The first principle is that every organization has to practice organized abandonment. That means, organizing to be able to stop things in a systematic way. Because if you have a running

Business, you have a lot of resources tied up in your existing processes and in the things you do, for example traditional reporting. The whole thinking is in that space.

The Present Situation and Role of Financial Managers in Enterprises

The goal of the financial manager in a for-profit business should be the maximization of value for shareholders. However, managerial goals may be different from shareholders. Management is expected to

continuously attempt to control and require adequate resources to prevent the company from going out of business (Ahamad, 2005).

The financial manager is responsible for the effective management of finance operations and to make sure the activities contribute to the successful management of the business. To be successful corporate finance

managers have several courses of action that can increase shareholder value. Two key factors are financing the company at the lowest maintainable after-tax cost and apportioning capital resources to investments that assure the highest risk-adjusted returns to investors (Lupia, 2006). To accomplish this, the finance manager must understand fundamental aspects of the business while working with the senior management team to create optimal operational practices. Finally, the finance manager must have the ability to execute the company's strategies. These actions create an environment where financial managers are able to accomplish their primary goal, which is maximizing shareholder value.

However, it is well known that not all managers at all times strive to maximize shareholder wealth. They sometimes engage in opportunistic behavior to maximize their own wealth. If left to engage in their own goals rather than those of shareholders, financial managers may take decisions such as relying on internally generated cash flows rather than depending on outside financial markets, in order to avoid market scrutiny.

Having said above, today, the role of financial manager must be looked at in line with following.

1. It s no longer only a number crunching process and reporting to higher management about policies and procedures and information about financial market on day to day basis.

2. No longer a role separated from the operational team (usually finance perception is only a manager of the funds), to be able to see the future as a member of the income generating team and then evaluate future within financial means.

3. Old era – green or red light comes from income generating forces to the financial management role. It should be changed to - Green or Red light should be evaluated in terms of the future by the financial management team before others and accordingly inform the income generating forces to adjust their strategies.

Financial Managers and Facing Innovation Challenges

Challenges facing financial managers can thus be considered**:** financial systems movement in the world is towards integrated structure. Stock markets in the near future also will be integrated and global. Therefore with considering the rapidly changing global financial issues during the coming years are needed to provide new solutions such (Khani and Parsayan, 2006).

1. Supervisory and coordinating bodies should be created.

2. Expanded Changes in information technology extensively formed.

3. The uniformity should occur in informing and financial reports.

4. Create the diversity and new design Specialized in financial instruments and financial engineering. The main changes are as follows:

Creating Competitive Ability

The role of human resources as factors of competition and competitive ability creation of organizations and can say today besides financial engineering, engineering manpower as an important factor in doing things and most importantly, creating thinking are discussed. As far as the world is moving to think engineering. In discussions about the competition can be said that a company's first competitive process based on competitive forces exist that are formed company or organization.

In other Words can study internal competition of each organization based on two axes; first thinker and human resources and then experts financial forces that cannot be found any competitive source except of

these two in organizations. So if the competitiveness of many organizations loses the competitive power it is due to neglect of two said factors.

In future glance the issues such as surmise financial and human needs is discussed. It means, an organization must be competitive to be able to help a good thinker forces themselves (all organization s

employees) to make required use in determining the organization needs to be able to take the standpoint of organization and make it qualitative in point of production and related costs.

Financial Culture Growth

One the most and effective method in financial innovation is financial culture growth. A good financial culture cause for more financial discipline and good opinion and ideas growth in the organization when organization put necessary value for his forces, customers it has well known that what it expect from them. So easily will delegate authority and even participate its customers in par their decisions in production matter on the part. Such organization with meet the financial needs of all personnel deals for the clarification of organizational costs and are easily able to assess their cost. Financial managers have undertaken the decision-making in enterprises, value and due to their skill in financial analysis and assets value determination, they are able to measure the effect of these decisions on enterprises, value. Financial managers have not found their value and place and this is duty is in financial managers, undertaking that to act in direction of enterprises, culture making.

Financial Protection

For financial strategy compilation toward competitive power creation in organization should develop the financial support method in the organization. in financial support method, those work that is true in financial point of view specify and their related resources can be guessed and the required budget will be provide to executives section by section before they ask about it have sometimes the only financial support is for the implementation of a project and that project and those contactors who are progressing well are paying higher budget. The Companies that do excellent project during the year, and option valuable financial results , budgets can be paid several times but vice versa in some other enterprises that saving own budget they have less funding next year will be appropriated. Such companies decline of a good financial position at once, and they are relegated in implementation of their strategies and after a while they detain of the future.

Financial Strategies

Companies that are having a good strategy and achieve success in terms of financial success, they improve and compete ability in the markets. Such companies do for reduction of their costs. In contrast with these companies, there are companies that with creating good financial techniques aimed at reducing costs or increasing their quality are still unsuccessful. Studies have shown that although these companies have gone some of the way rightly but they will not give necessary training to their employees and units to solve problems, training, and when such employees in organization go astray, they punish him, but do not try they financial culture growth in such atmosphere the innovative thought can not be grow up.

Transparency

Unsuccessful reason of much organization is that they will not clear the concepts and organizational objectives and financial issue for its human resources and do not direct their human forces toward financial

culture.

Aside from cultural issues and financial education, having appropriate procedures in organizational structure should be very clear and financial transprancy is necessary.

Other factors affecting the financial innovation can be the Internet's role in creating greater communication between companies can be pointed and said: "Today's planning methods and access to information has changed. Program (INTERNET EXPLORER) IE except for non-financial applications and information relevant in planning and financial planning issues such as contracts are widely used on the Internet.

Internet Application

One of other factors affecting the financial innovation can be the Internet's role in creating greater communication between companies can be pointed and said: "Today's planning methods and access to information has changed. Program (INTERNET EXPLORER) IE except for non-financial applications and information relevant in planning and financial planning issues such as contracts are widely used on the Internet.

These actions not only cost is very low, but financing programs through the Internet or intranet at any time and place must be. Just a community must will for development, culture toward making necessary the use of communication technology pay. The culture building organizations in the financial system is necessary because many of the methods used to finance new computer s are designed. Therefore it is necessary for success as we further implement their financial systems, initially to review its financial procedures and pay the fundamental change in its circulatory system applications in the financial issues we can create. Capabilities may be better than wide net in their financial plan and take more interest in their financial systems insertion.

Overall they exist of motive and trained human resources, having good technology and good financial resources, the use of IT for production control, waste and culture growth effectively reduce production costs and quality, necessary for a successful organization is considered to compete with rivals be. Another important point about this is the customers. If they can demonstrate how they can reduce costs, will be attracted towards you, although the cost of after sales service they get. I can create more communication with their customers; they create a culture of quality and basically can define quality for them.

Effective Factors in Financial Innovation Top Manages Support

One of the important factors that create litter and a provides areas of growth of financial innovation and create atmosphere for financial managers to show their creativity is values and philosophy of and top management support extent of organizations from innovative and risk accepting financial officers. Research carried out in this area shows that the specific existence in top management of organizations such as financing and start and operate new projects - make use of the employees new ideas - values and compatible with innovative management philosophy - the belief in shared management -tolerate deviations from the rules - appreciating the financial mangers having the idea and risk power and decision making ability - accountability in innovative activities - accepting risk as a positive feature - the diversity in financial support - innovation experience - can be very effective in creating and foster of innovation. (Peter, 2002)

Strategic Thought

Another important factor to raise the necessary context and provides innovative development, is creating "strategic thinking" in the organization. Strategic thinking on two levels: individual and organizational integrity

and prudent to make certain that the cause of one side employees a better understanding of the organization and its operational environment, leading to their creativity and be repeated from other areas of communication and more interaction between managers and employees provided, and make the operation of ingenuity and creativity of employees in organization According to Hrakavs "Strategic thinking is like learning two rings, one to challenge existing assumptions and other obliges new solutions and innovative development that eventually leads to potentially better practices in the organization is. So if an organization is able to achieve a situation that most managers and employees are the owner of strategic thinking and innovation as well as the issue of strategic look, in this case always questions the status quo will position and to newer solutions and achieve better and yet his hand that turns it from those who join their groups, support and guidance they will. With this process, those prospects are favorable to your organization and in the future will be in the form, and a better understanding of the whole organization will achieve its operational environment and to achieve optimal vision and implementing the creative environment organizations they ran and innovation. employees in the organization is According Considering Hrakavs "Strategic thinking is like learning two rings, one to challenge existing assumptions and other obliges new solutions and innovative development that eventually leads to potentially better practices in the organization is. So if an organization is able to achieve a situation that most managers and employees are the owner of strategic thinking and innovation as well as the issue of strategic look, in this case always questions the status quo will position and to newer solutions and achieve better and yet his hand that turns it from those who join their groups, support and guidance they will. With this process, those prospects are favorable to your organization and in the future will be in the form, and a better understanding of the whole organization will achieve its operational environment and to achieve optimal vision and implementing the creative environment organizations they do their best for creativity and innovation of financial mangers.

Cultural Factors

One of other most factors in provide area for creating and nurturing innovation affect the structural and cultural factors such as complexity, formalization, centralization and organizational culture. If the horizontal level of organization (number of jobs and tasks) or in vertical (number of management posts) and enjoy the complexity of the organizational communication and more formal be possible to engage the group in the organization and greatly reduced by this organization goals away from making innovations. Also, in the absence of formal organizations is high, people do not have freedom and flexibility to work from acceptable and does not have tolerated the behaviors that result from creative and innovative employees will be denied. In contrast, if learning, flexibility and acceptance of risk by the organization to be known as the central principles and employees according to the talent and intellectual power and its executive decisions and judgments are competent and able to get away from the focus on integration right time right moves designed and implemented in turn, form the background for the use of individual creativity in the affairs will be made.

Robert Hysrych and Michael Peters appropriate environmental factors to create and foster innovation are summarized in four aspects. First, the organization must be managed because the boundaries of technology, research source for successful realization of new ideas are related products. Second, experience (trial and error) should be encouraged and mistakes along the way that growth and development of innovative products made through production, to be allowed. The third factor, the availability of company resources

i.e. financial resources and manpower should be readily and adequately available to be innovative. Finally, the fourth factor, top management support is the innovator innovators so that should not worry about achieving your goal are predetermined, but his innovative activities should support multilateral organizations shall have senior management.

"Ltshvlr" by offering a theory as Tryz (TRIZ) believes that this will foster the creation or innovation, it is necessary that the principles, rules and techniques will follow. So people with these rules and techniques to learn how to lose can be called innovation, process innovation predicts the direction and steps taken. Considering Ltshvlr "If those principles and rules that there is innovation in all respect, they can become an innovator and innovation and growth provide idea to bring. Five principle of principles "Tryz included - move in to resolve conflicts - Trying to ideal, reducing the negative and increase positive feature is - trying to understand and achieve the basic functions needed, not just the way solutions - trying to optimize use of available resources - and looking at the issue from all angles - is possible.

Obstacles to Innovative Financial Managers

There are a number of obstacles to innovation of financial managers .The important among them are as follows (Nasimi, 2010).

- Structural and hierarchical rigidities which may not allow for the proper innovation of their employees. They create obstacles and hamper the process.
- Lack of mutual trust and confidence is another serious problem. When they do not trust each other, delegation of responsibility and team spirit is affected.
- In some enterprises the approaches and methods designed for innovation may not suit the environment and attitudes and perception of the employees.
- In many situations, the employees may not have the necessary skills and capabilities to expose themselves and assimilate the empowerment process.
- In some circumstances of opinion among the Top managers and also employees may obstruct the process and even stop the process.
- Excessive control by top managers, bureaucratic attitude, ordinate and sub-ordinate relationship can stop the process of innovation.
- There are some evidences to reveal that in some cases the top managers are afraid of innovation because in this process they have to delegate the powers and they are not willing to do this as it will reduce their position and control. I frame work and techniques, innovation process cannot be accomplished as desired.
- It is also possible that the employees may not be willing to participate. They may be indifferent to autonomy and accountability. They don t want new and challenging responsibilities.

Legal inadequacies & inconsistencies can also create contradictions, controversies regarding powers & responsibilities. Legal disputes defeat the very purpose of innovation.

Department and compartmentalization, absence of horizontal and vertical communication and understanding is another hurdle.

Innovation may end up with favoritism and discrimination. It may spoil the working environment and lead

to distrust and heatedness. In the name of innovation, there could be political interference or the top managers may use their political clout the entire Innovation process.

It is also observed that in some cases due to lack of strategic polices of top managers there will not be a suitable atmosphere or opportunity for financial managers to create innovation.

Conclusion

Promoting human and its effect on various aspects of organizations performance on and in expanded level its affect in economic and social development of the community is oblivious to everybody to promote this capital contains a set of competencies for the use of knowledge and skills to achieve the programs results.

Competencies include purities such as innovative features such as Flexibility, leadership, innovation ability, the ability of problem solving, constructive communication with others, Entrepreneurship of complex skills such as learning knowledge circumstance.

Role of financial managers have been involved abundant changes during passing time in organization the financial techniques have been complicated fundamentally most of companies have activity with several objectives some of them working in international level and others are doing business at same time with so many organizations all of these organizations need to financing their required financial resources so here is necessary that financial managers be known about capital market conditions, financing, investment, planning for marketing strategies all are important role that the financial managers undertaking nowadays.

Hence, efficient management of every enterprise is closely linked with efficient management of its finance. The role of financial mangers is very important in order to control and manage the finance. Therefore, with due attention to globalization and need for competition, enterprises need to recast their management philosophy and polices to improvise their competitive strength so that they Can emerge as truly modern and word class enterprise. For this purpose strong army of empowered Financial Managers are needed in advancing the image and prosperity of corporate organization.

Innovation of financial managers today plays an important role in the success of enterprises & organizations especially in executive & supporting operations, provided it is approached as a basic management culture.

Innovation provides an opportunity to top managers to have best use of enterprises financial managers to achieve the organizational goals. In order to have wise and Powerful human resources finance department plays an important role. The participation in decision process improves their productivity and efficiency and since the top managers can share their expertise with middle managers under their control so that they can take quick and correct decision as much as possible. If financial managers who are also middle manager receive necessary training for productivity and be innovative, they can help internal as well as external organizational clients quickly. Since financial managers can take necessary decisions, there is no need of continual presences of top managers to direct and guide them for every case. When financial managers can take direct decision in connected matters, they feel better and will have motivation to

showcase their inherent genius. Therefore innovation will create self respect and reliance and self belief among financial managers. Innovation needs the top manager s support. Undoubtedly in today s growing world knowledge based, attention to human resources as development axis and identification s and measurement system this important and valuable resource is of necessities and the role of innovative financial managers as decision maker this would more important and strong in this filed.

However, financial managers should firm up in all areas have an active presence as an effective member of leadership team of organization and performance role to achievement of organization ,,goals and providing expectations of various users and shareholders.

Financial managers can then enjoy of this capacity to be innovative and with surrounding to the knowledge and learning of various marketing, human resources management, capital markets, financial knowledge domains, information technology and etc. Change their role as the point of components and elements link together organizations andbusinesses communicate with their environment.

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Innovation Management and Controlling in SMEs

11

Dr. Himadri Ranjan Mishra

Abstract: *This article focuses on the concept of innovation management in small and medium-sized companies, based on the fact that change management in a hypercompetitive environment is a decisive competitive advantage for small companies in comparison with big ones. The author describes innovation management in terms of process management based on management plans and targets and their controlling. Innovation management is considered as system management of processes, products and strategic changes.*

Key Words: *Operational Innovation, Product Innovation, Strategic Innovation, M-C Model, Controlling*

1. Introduction

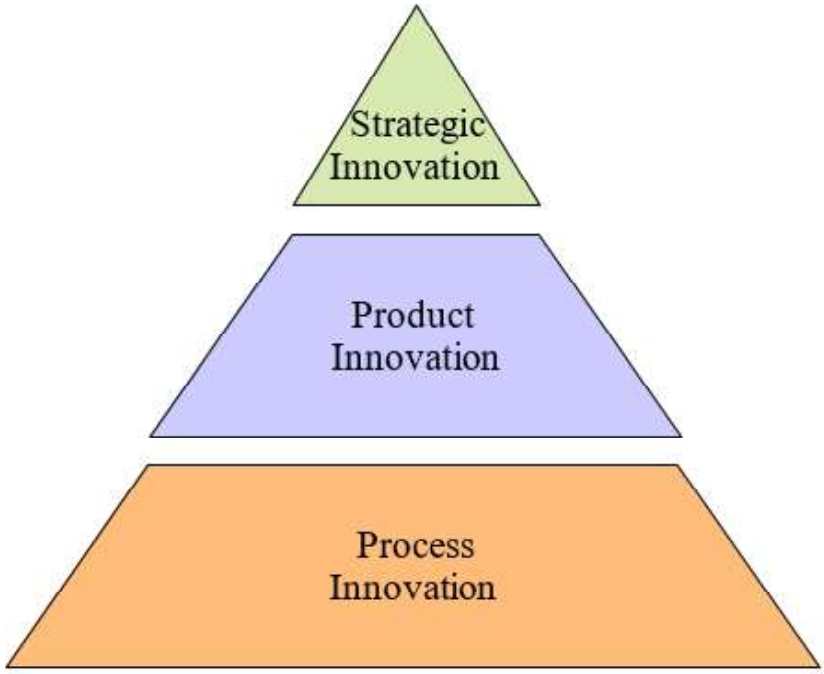
Innovation management is based on the innovation business strategy that must respect the business strategy, meaning the company's long-term missions, visions and targets. The core of the innovation management is a systematic approach to implementation of changes that should lead to improvement of the products, processes or position of the whole company. The innovation activity is successful only if there is an appropriate response from the market, for example in the form of higher sales or happier customers, in the form of image strengthening and creation of better relations with the individual groups of the company. However, at the same time source options and financial requirements of the company owners and creditors must be respected and the innovation activities cannot endanger the stability of the company. It is not possible to perceive innovations only as an improvement of the products that we offer. We can change the business processes, products, as well as the overall focus and direction of the company. Innovation management, however, must be a carefully balanced controlling system (M-C model).

Process management based on the M-C model[4] can be defined as the Management Control System that includes a comprehensive view of management on the basis of management accounting, management theory and personnel management. It is an interdisciplinary management system where the most important thing is not the interface of the process but the understanding of business management as a whole, mastering planning tools based on research, objectives, visions and missions (management) and control tools based on evaluation of deviations and proposal of risk management measures (controlling). The M-C model shows that a successful business can work only if you manage to grasp all of its processes and understand their interdependence.

2. Innovation Management

Innovation management in small and medium-sized companies can be divided into the management of strategic, product and process innovations. Each of these innovations contribute to the overall success of the company and therefore it is possible to express it hierarchically (Figure 1) when every higher positioned innovation means a higher level of realized value.

Figure 1. Hierarchical view of division of individual innovations



2.1 Process Innovation

These are innovations of an operational nature (which is why they are sometimes called operational innovations). Process innovations usually do not bring an immediate competitive advantage but the basis for obtaining the company's long- term position. In principle, it is the optimization of all defined business processes of strategic and operational importance in order to increase efficiency using systematic improving of the activities aimed at cost avoidance or increasing performance. There are many methods that are not used by small and medium-sized companies to the full extent but within the framework of the process changes they should be used at least partially. The following methods can be used as the basis for a process innovative mix: Lean, Six Sigma and TOC (Košturiak and Chal´, 2008).

The TOC Method (Theory of Constraints) is based on the search of the so- called narrow space of the process and its subsequent elimination in order to increase its throughput and continue immediately with the search of another weak point.

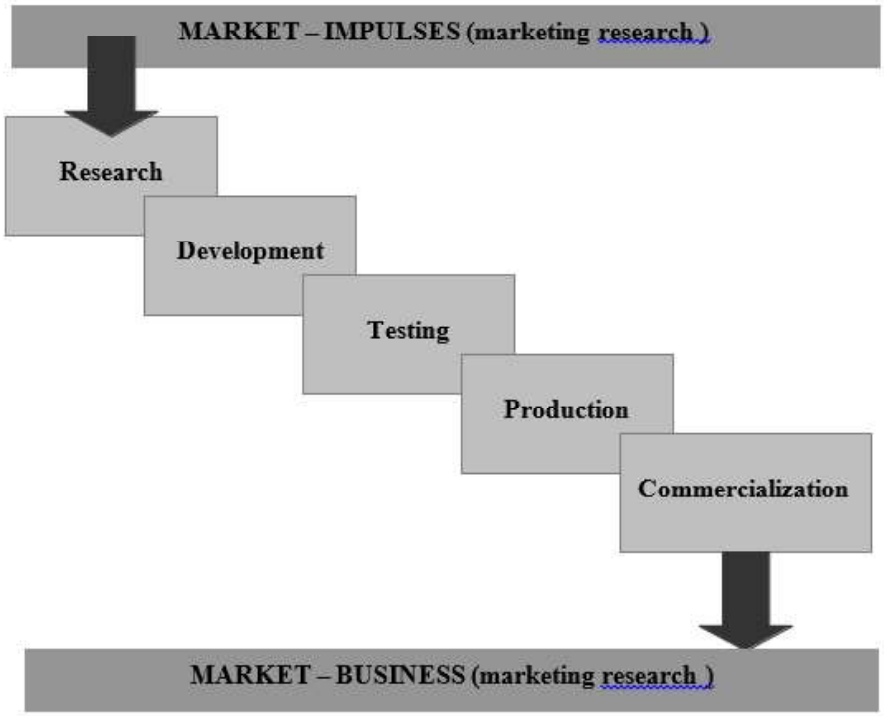
The principle of **Six Sigma Method** is to increase the stability of the individual processes. The Six Sigma Method has many modifications and was originally founded on six basic principles that greatly expand the activities associated with process innovations - customer orientation, correct information, continuous process improvement, flexible management, distribution based on cooperation, pursuit of perfection in case of tolerance of failure. Problem solving in Six Sigma Model is based on the so-called five steps procedure: Define - Measure - Analyze - Improve - Lead. In process quality management we understand Six Sigma as an activity whose aim is to control quality and resources and consistently meet deadlines.

Finally the **LEAN Method** is based on elimination of waste in and across the individual processes. The point is to recognize all the activities that do not provide any values, from the start of communication with the client and accepting their orders, to product delivery to the destination. The aim is to provide an optimal flow of materials and information.

2.2 Product innovations

To understand the management of product innovations (sometimes the term product innovation is also used, but with regard to the fact that product innovation is more often linked with a specific improvement of the additional services, it is preferable to use the term product, which means both the product and service), one needs to understand the whole process of introducing new products to the market, from research through to commercialization (Figure 2).

Figure 2. Stages of product innovations



Research

Research is the basis of all product innovations and is done on a scientific level, using a variety of methods. We distinguish between basic and applied research and the exact definition is given by the OECD.

Basic research (Korres and Drakopoulos, 2009, Lopez Rodriguez and Garcia Lorenzo, 2011), means experimental or theoretical activities that are primarily focused on the acquisition of new knowledge about the most basic causes of phenomena and observable facts, without, however, addressing the issues of the use of such knowledge[5] This research does not deal with a specific result. The scientist moves in a wide range of research activities, in some cases, it may also include accidental discoveries motivated by the scientists' curiosity. However, it is virtually indispensable for higher-order innovations and for a truly revolutionary change. It forms the basis of the applied research based on new methods, suggestions and ideas. Investing in basic research does not result in an immediate effect; on the contrary, we often speak about so-called lost investment (the method of trials and errors). However, if the basic research is moving in the right direction and is moved at an early stage into the level of applications and development, there is a chance for important financial effects to be implemented, especially in the long term (such as patenting of methods, procedures, designs or new technologies).

The **applied research** includes experimental and theoretical activities in order to acquire new knowledge, but clearly focused on specific and predetermined targets of use[6] In fact, this means that the applied research is focused on specific targets and seeks answers to defined questions. It is usually applied by individual companies and commercial sectors. The research is specific. It can be systematically and partly grasped and includes not only the research of scientists but also of people from practice. It either follows up the basic research (we sometimes talk about higher-order innovations - new discoveries, vital product changes in both utility and design) or it results from practice (these are usually basic-order innovations - simple user or design changes not leading to entirely new product groups but rather helping to improve the existing product lines). Basic research is sometimes called exploratory research, while applied research is called targeted research.

Development

This is systematic work that according to the OECD definition uses existing knowledge gained from research and practical experience and aims at the production of new materials, products or devices, installing new processes, systems and services or substantially improving what is already produced or introduced. The company's individual departments contribute considerably to the development and their activities aim at specific targets, in terms of time, technologies or costs. The development has a fixed order, must be continuously assessed by managers and in larger companies has its own department or division. We usually talk about so- called experimental development that has this label even when drawing from numerous European and relief funds.

Testing

When the development is completed, there is continuous testing and evaluation. Testing is usually done in so-called semi-operational units (these are not the main production facilities that will then be used for mass production, but purpose-built premises on a simpler basis simulating future production and sufficient to test products). The testing itself takes place in several stages and is closely linked to the production and quality department. The testing usually includes **internal tests** (used only for assessment within the company) and **external tests** (the products are already designed for a selected group of customers whose feedback is requested). In the external test phase the marketing department participates in the process in order to negotiate with the customers who participate in testing, the purpose and phases of testing. Cooperation with the market has two effects: firstly we get feedback on usability, ergonomics, design, price, etc., and secondly we demonstrate that we are a reputable company oriented around innovation and interested in the opinions of its customers. This stage also includes the final calculation and preparation of pricing, distribution and communication strategies (Kašík and Havlíèek, 2012).

Production

The actual production is done in full operational mode, but initially still in a special mode, especially with regard to final quality. The following systems are fully implemented: QMS or TQM (Havlíèek, 2011). Full production launch of the new product is a very difficult process that must be initially continuously monitored and evaluated especially with respect to output quality, customer response, securing of raw materials, compliance with the declared properties of the product and of course with respect to the overall cost and ultimate efficiency. The financial departments those are usually responsible for calculations have to constantly

monitor the prices of all inputs and adherence to the time limits. All target indicators are commonly not met in the first stage, however, it is necessary to correct all information communicated to the market (quality and timeliness of deliveries), while the issue of fixed and variable costs and other items affecting the price formation may be initially below expectations (optimization of the management of inputs and the whole production process is sometimes also a matter of a few months).

Commercialization

Commercialization is based on careful preparation contained in the marketing plan that is based on marketing research. It is followed by the preparation of the business plan that must be designed more conservatively and copy the start-up curve of sales of brand-new and innovative products. If these are the elementary innovation systems (of lower orders) then estimating sales in the business plan is usually easier because the sales of the original product are considered. On the contrary, it is very difficult to estimate sales for brand-new products or higher-order product innovations. The basis is perfect marketing research, customer testimonials from the testing stage and the pilot plant and marketing company readiness to introduce new products on the market (price, distribution and communication strategy). One of the key activities is preparation of a communication plan based on the communication mix (advertising, sales promotion, public relations activities, direct marketing) that must conform not only to the nature of the product, its novelty and ambitions of the company, but that must also respect the territory to which we plan to offer the new products and customer segments. The entire stage of commercialization must be properly timed, both with regard to completion of testing, and the overall position of the company and timing of the product, respecting its lifecycle - stage of the new product launching or stage of the lifecycle of the existing product (Havlíèek, 2012).

2.3. Strategic innovations

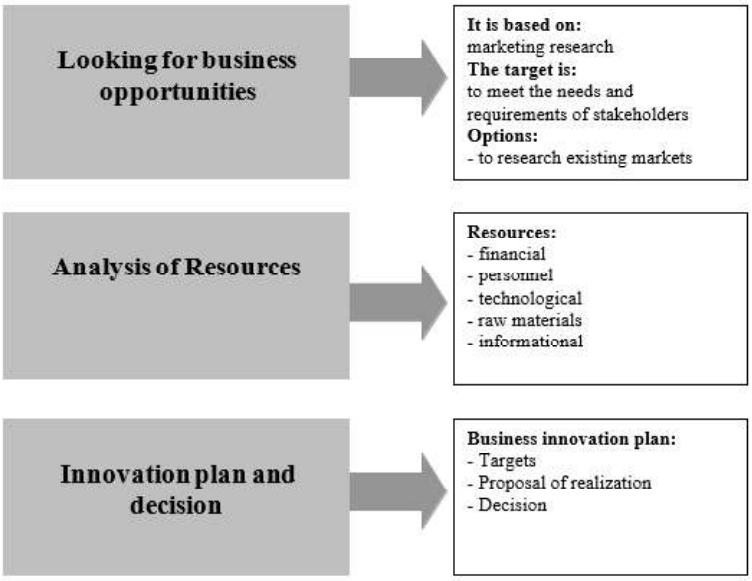
It is an absolutely vital part of innovations whose purpose is to change the direction of the entire departments, companies or groups. The usual target is to create a new business model that will help to increase the market value of the innovator (Pekka-Economou and Hadjedima 2011, Theriou et al., 2011). The strategic innovations are associated with the change of the organizational architecture of the company with a variation of products based on higher orders and fundamental change in the marketing mix, or overall perception of the image of the company. From this perspective, these are strategic changes related to:

- a completely new market or market segment;
- new products or product lines;
- a new business system (from production to distribution);
- increased share in customer costs (Košturiak and Chal´, 2008).

2.4. Innovation model in small and medium-sized companies

Briefly stated, innovations are changes in small and medium-sized companies. The management team must create such conditions in the company to permit these changes to be implemented. Controlling is responsible for ensuring that innovative activities are continuously measured and evaluated. The general model of systemic innovation management is shown in Figure 3.

Figure 3. Innovation model of small and medium-sized companies



7. Innovation controlling

Controlling is responsible for ensuring that innovative activities are continuously measured and evaluated. If the innovative procedure or innovative activity does not achieve the expected results it cannot be considered a success, even though it was well-prepared. Likewise, it should be noted that implementation of changes means taking risks and a company that does not take any risks cannot achieve significant success. It is therefore impossible not to risk anything and not to apply any innovations, because it could lead to stagnation.

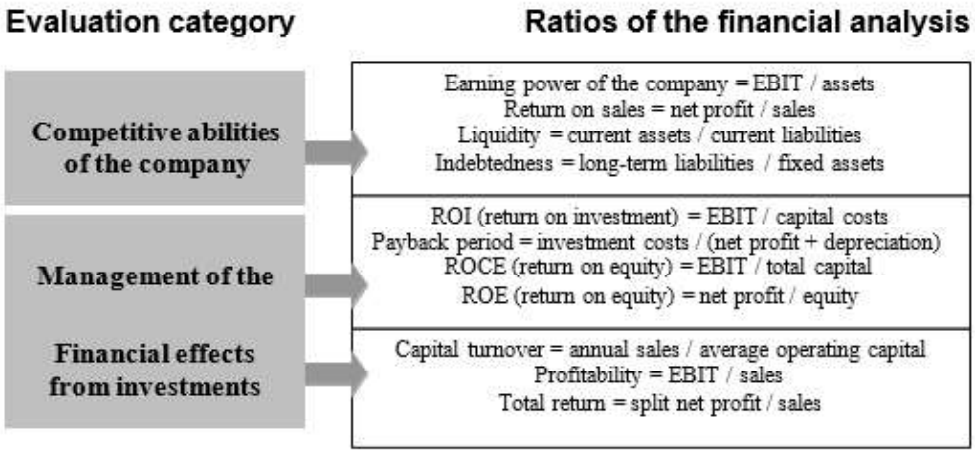
7.1. Strategic innovation controlling

It is based on the management of key financial indicators, creation of common projects, strategic partnership, strategic alliances and long-term investment plans linked to higher-order innovations.

Strategic indicators

With regard to the ambition of the innovation plan there is a continuous follow up of fulfilment of marketing, business and financial targets, all in relation to the incentive plan of the company or the individual departments. the ultimate success of innovations is usually interconnected with the financial results, it is good to recall the main indicators of financial analysis to assess effectiveness of innovations used (Figure 4.).

Figure 4. Most commonly used indicators of the financial analysis of investment efficiency evaluation (Pitra, 2006)



Choice of strategic partnerships and alliances

One of the most important business activities that goes beyond innovation, however, is what the owners or management consider the strategic dimension. The proper legal or organizational structure, including creation of strategic alliances with scientific research or financial partners, is essential to the success of the higher-order innovations. In the market, there are many forms of partnerships, groups and activities focused in particular on innovations in new technologies. The role of controlling is to ensure external examination in order to decide whether to carry out cooperation or partnership, and if so, when, and especially to create an overview of the benefits of the given partnership.

Incubators

The purpose of incubators is to create some space for new and innovative small and medium-sized companies as a background for beginning the business. These are usually the so-called business incubators that are specifically created by universities, municipalities, counties or public scientific research organizations and focus on supporting new small companies aimed at the development of products, technologies and services intended in the second phase for the market. The purpose of these incubators is to create for these companies different facilities in the form of research and development laboratories and provide for more small entities shared services in accounting, administration or counselling.

Clusters

Porter defines clusters as local concentrations of interconnected companies and institutions in a particular field. Clusters include a group of linked industries and other entities important for competition. They include, for example, suppliers specialized in inputs such as components, machinery and services and providers of specialized infrastructure. Many clusters also include governmental or other institutions such as universities, regulatory agencies, research groups or trade associations that provide specialized training, education, information, research and technical support.

The OECD defines clusters as networks of interdependent companies, institutions providing knowledge and ensuring communication and customers interconnected with the production chain that creates the added value. It is therefore a concentration of interconnected companies, governmental and academic institutions in a specific industry. They include the entire value chains of activities, from research organizations, academic institutions to supplier, manufacturing and distribution companies. The aim is to create a group of companies that can differ in their activities but that can also in many ways compete. Their shared activities allow the companies to save up and expand more easily into foreign markets.

Technological Parks

These are in particular scientific and technical parks that fulfil both the role of innovation and incubation. These parks are usually specific institutions that receive companies from the small incubators and that devote to the base for more business entities, especially in terms of technology transfer (the process of transferring knowledge that enables innovative products, manufacturing, working and testing methods and services) related to innovation management in companies belonging to the parks (Havlíèek, 2011). The scientific and technical parks are often financed from structural funds and should serve as incubators for the creation of innovative companies, especially in progressive sectors. These are usually very specific facilities set up to support the innovation potential of small and medium- sized companies, but they may even be virtual.

"Spin off" and "Start up" companies

The new small innovative companies that in the first phase of its existence mainly use the facilities, laboratories and results of the research and development of the universities or research organizations are called "spin off" companies. These are very often companies established by students and young scientists and are therefore often part of universities and parks. They are fundamental to the functioning of both incubators and scientific and technical parks. In the advanced stage, but still at a time when the company is not commercially self-sufficient (there are no sales), usually in the phase of the applied research and development, these entities are called "start up" projects. This designation clearly communicates to potential investors that it makes sense to invest in them. When the company acquires the status of an SME company it is able to start its first commercial activities. If this is a project for which the small and medium-sized company ensures sufficient resources (financial, personnel, marketing), the project remains as an economic activity of the small company and if an innovation becomes so attractive and demanding that it cannot be developed in the small and medium-sized company, the company looks for a strategic partner at a higher level in the form of venture capital, strategic or financial investors.

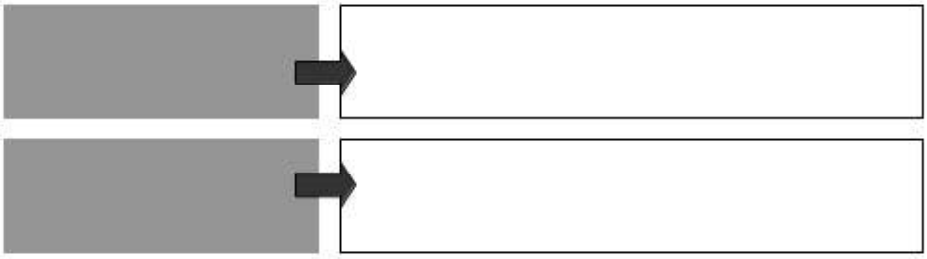
Figure 5. Stages of the development of highly innovative companies

Idea, student laboratory, association with a university, shared spaces (incubators, parks). Orientation primarily on the research.

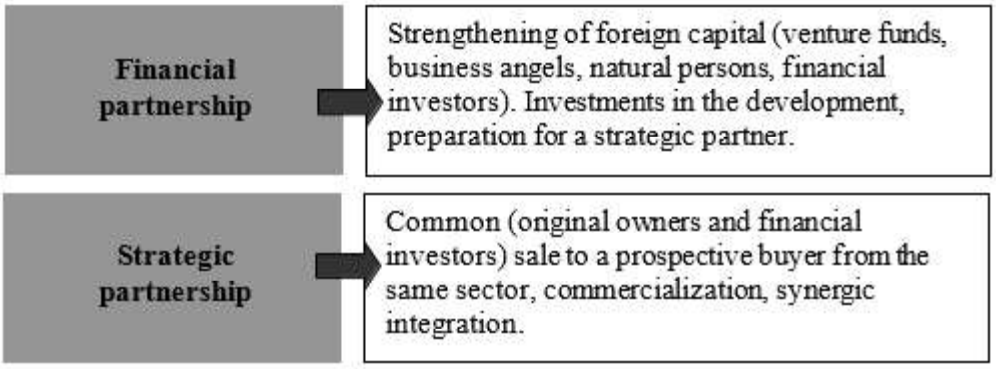
Start up company

Micro company, transition from incubators to a real environment, orientation especially in the development, preparation of commercialization.

Small and medium- sized company (SME)



Units or dozens of employees (up to 250), budgeting, financing and commercialization. Appropriate investments.



7.2. Operational innovation controlling

It focuses on short-term innovation targets, the concept of organization of the whole innovation process, financing and operational risk management. It should eliminate the risks associated with immediate innovation management, particularly with regard to the roles, authorities and responsibilities of the individual departments and managers in the innovation process.

Operational risks are associated with the direct operation of the business immediately following the innovative activities. The main risks in relation to the internal processes are divided into three categories (Pitra, 2006):

Technological risks:

- incorrect identification of needs and market requirements;
- errors in the concept of the research and in the choice of technical solutions;
- poor choice of distribution channels.

Operational and commercial risks:

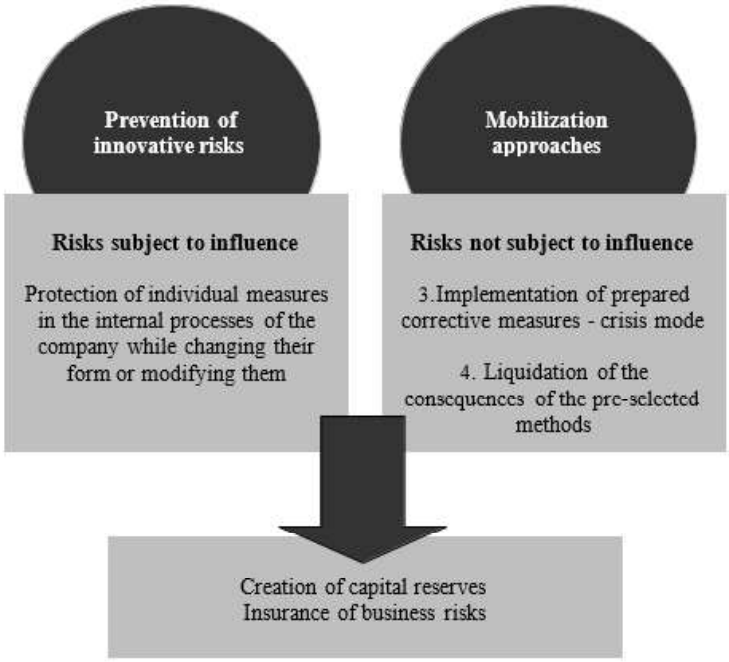
- inadequate production and working practices;
- unreliable subcontractors;
- incorrect external communication;
- inappropriate pricing policy.
- poor choice of sellers.

Financial risks:

- underestimation of the possibility of insolvency of customers;
- incorrect setting of exchange rate and inflation risk;
- lack of preparation for legislative changes with regard to the taxation of income and tax payments.

Zdeník Pitra also identifies the main steps leading to elimination of the above-mentioned operational risks. They are divided into two steps: activities aimed at prevention of risks resulting from innovations and minimization of already existing problems associated with innovative projects (Figure 6).

Figure 6. Elimination of innovative operational risks (Pitra, 2006)



8. Summary

The article outlined the main areas of innovation management divided into change management of processes, products and strategies that are generalized in the innovation model, applicable in most small and medium-sized companies. The authors understand the innovation plan as a tactical document based on the three pillars of operational plans: search, analysis and plan. Given the importance of innovation, innovation controlling is described in particular at the controlling strategic level in relation to strategic financial ratios. In a hypercompetitive environment the innovations of small and medium-sized companies become the crucial activity that decides their survival. Process innovation management and the evaluation of its efficiency and time are key competitive advantages in relation to big companies.

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12

Innovation - a Challenge for the 21st Century Managers

Dr.Munmun Mohanty

Abstract: The knowledge based economy entails more and more the intangible assets as a main tendency in the actual times. In the new economy, what counts is the model of thinking and the creation, which represent the key of the competition. The property of the ideas and the way one turns to advantage the economic potential of these, are the factors that bear more and more upon the future of the organizations and of companies, and this is also the one that gives the competitive advantage on the market. In this paper we have as a purpose framing the importance of innovation within the organizations, the problems that the managers confront during this process and also to present an evaluation model of the intangible assets in order to meet the organizations that need financing.

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Keywords: innovation; management; challenges; financing; intangible goods;

1. Introduction

Innovation is considered to be a vision, a concept, a strategy but also a solution. In this context we can assume that innovation projects in order to become a fact and to achieve their purpose need an idea that helps reaching a certain aim either economic, social or organizational.

Perceived in most of the cases as an exclusive concept, innovation can be approached only by some companies. This thing should be changed because innovation is accessible and comes in hand for everyone. What leads to a successful innovation are the good ideas, the process and the best assigned resources. But there must be paid a lot of attention and elaboration when we are making the selection of the good ideas. Even if the intuition is spirit's component for a leader, it must be oriented towards a well designed process. When the process is well based and defined, and the organization is capable of heading the creativity of the stakeholders on generating new and valuable ideas, their performance is rising and the rate of success becomes better.

In the technical- economic literature, innovation is defined as the change-over of the potential technical-scientific progress into a real one, under the circumstances of the new products or technologies. The term "innovation" comes from the latin word "inovatis" (in- in, novatis- new), what in translation would mean innovating, new, change. Innovation is the equivalent for news, something that has no precedent. In the specific literature, the term of innovation has various definitions and it is dealt with under many aspects, taking shape in two tendencies: when innovation is presented as a result of a creative process under the

aspect of production and new technique, technologies and high- performance methods or as an implementing method of the new elements, aspects and principles by replacing the already existing ones.

The notion of "innovation" from the economic point of view was analyzed for the first time, by the Austrian scientist J. Schumpeter in the first decade of the 20th century. In his work "theory of economic Development", innovation is defined as "the totality of changes having as a purpose the implementation and usage of the new types of products, means of production and transport, outlet markets and forms of organization of the production process". In the framework of innovation, as it is defined by Schumpeter, it is recognized to be fitted five types of activities, naming: 1) the creation of a new product, 2) introducing a new method of manufacture, 3) entering on a new outlet market (or creating a new one), 4) using a new raw material 5) a new structure of the company. Lately, according to Joseph Alois Schumpeter (1934) it can be admitted the existence of the sixth activity: the creation of a new image for the company. According to the beliefs of Schumpeter innovation represents the main source for the profit. He states that, in essence, the profit is the result of a new combination, and without development there is no profit and vice versa, without profit there is no development. Another definition that states very well the role of innovation in the technical- economic activity is the one of Peter Drucker. In his vision, Drucker (2006), "innovation is the specific tool of an enterprising manager, the mean through which he exploits the change as an opportunity for various businesses or services". According to the opinion of the Russian experts, innovation represents "the result of creation and assimilation of the new products or modified products which satisfy practical social needs and generates economical, technical- scientific, social and ecological effects"; or "the profitable using of the inventions objectified through new technologies, types of production, organizational- technical with productive, financial, trading feature. In the field of macroeconomics, by the studies of Nikolai Kondratieff (1892- 1938), are described the connections between innovation and "conjectural cycles". According to him the long phases of development/ increase are based on profound and periodic (economic cycles of about 60 years) innovations. More than that, according to Michael Burnam- Fink (2011), it is foreseen the passing from the "informational society" to the "knowledge society", the beginning of a new Kondratieff cycle, which provides new areas of increasing, where the new knowledge become the main competitive factor.

The systemic description methodology of innovation, according to the economic conditions of outlet market is based on international standards. In the international standards, included in the Frascatti Manual of OECD, it is made known a topical definition of innovation. According to the instruction, the innovation is "the final result of the innovation activity as a new or improved product which can be put on the market; a new or modern made technological process that can be practical used, and also a new approach for the social services".

The definition which is accepted now by the European Commission sees the innovation as "the conversion of the new knowledge into economic and social benefits, as a result of the interaction between various subjects of a system that includes companies, research institutions and financiers in a local, national or international frame".

The Romanian legislation deals with innovation from two different aspects: innovation- as a product; a new function or improving the functionality of a product, process or service, in any field, and which could or can answer to the market demand or which could generate a new demand from the market; innovation- as a process: the activity that allows the apparition of innovation- as a product- and which is based on an

individual, social, on the company, creative and dynamic behavior. This activity also includes the research - development.

2. Innovation in Romania

Being considered one of the "modest innovators" (see fig. 1), Romania is among the countries with the weakest performances in what concerns the innovation, according to the data provided by the European Commission in the analysis of Innovation Union Scoreboard 2014. Romania is a "modest" nation from the innovation perspective, being on the antepenultimate rank, behind Poland and in front of Lithuania and Bulgaria.

The European Commission for the accomplishment of this study took has taken into consideration various factors, expenses for research, development in companies and also to the governmental level, number of students, doctorates, or registered patents- for the most of these we are below the average of the Europeanion; the most recent study indicates an increasing in the number of doctorates, and in the number of patents and community trade mark and a decreasing on the level of companies' expenses in what regards the innovation and also to the level of the investments approached.

In this context, there is a need for increasing the number of innovative companies and enterprises which should activate on the Romanian market.

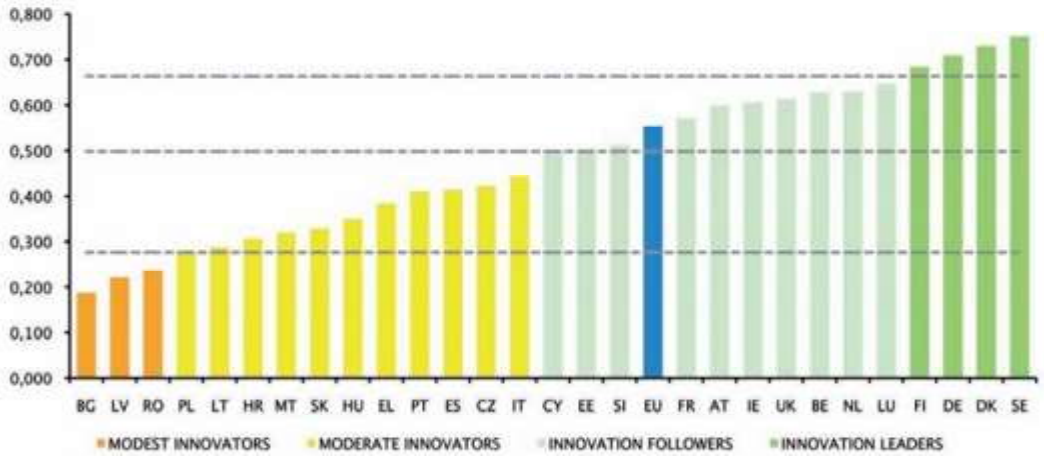

Fig. 1. Innovation performance in EU Member States Source: Innovation Union Scoreboard 2014

Even if the macroeconomics innovation signs put Romania at the bottom of the ranking from the point of view of innovative countries, the projects for innovation begin to be more and more present in the economic agenda and also in the micro and macroeconomics agenda. For supporting these actions, the innovation was placed in the centre of the EU strategy regarding the economic increasing and developing new jobs. In this context the member states of EU are encouraged to invest 3% of the GNP in research and development until 2020 (1% of public funds and 2% from private investments), which is estimated to generate 3.7 million of new jobs and would increase the GNP with 800 billions of euro per year.

But, beyond the numbers, the research and innovation are the ones that improve the livelihood and the conditions of employment, improve the competition in Europe, it stimulates the economic increase and creates new jobs.

Passing to a new era of innovation, which will be changed to the most important driver of increasing, after the industry, distribution or information, represents a necessity and Romania in order to resist in a globalized

world and in an always changing Europe, not necessarily in a good way needs to step out from the cheap workforce or out of the social help and use the native intelligence of the nation.

Taking into consideration the fact that the European Union is a main actor in the scientific and technological worldwide scene and an indisputable leader in many fields such as energy from renewable resources and environmental protection, efforts must be made for maintaining this position and for facing the international competition which is more and more bitter in the field of research and of technological production.

In this context the future of Europe is linked to its capacity for innovation, for converting the great ideas into products and services that would lead to economic increase and new jobs. The initiative "A Union for innovation"- EU strategy for promoting of this process- proposes to create an environment where Europe to be able to encourage new ideas.

Finding solutions to the challenges of the society, stimulating at the same time the increasing and the competition, there is needed a perfectly functional excellence network in research and transposing into practice the innovative ideas.

To the level of the Romanian companies there are some phenomena which rise above the others in what regards the innovation and the lack of the innovation strategy agenda, but there are also multinationals recognized internationally for being innovative and activated mainly on our market without having a well established strategy on this subject. This situation still became improved by the acquisition of some successful companies which have been integrated in multinational groups and so innovation cells have been developed.

Of course, the specificity of the market and the diversity of the existent tendencies on the various economic fields leaded in time the need for innovation concerning the personalization, adaptation and increase of the competition. This way appeared the natural phenomenon of consolidation the first innovation budgets and the need of assigning the responsibility of it to a certain person or department within the organization. The managers should understand that in their organization it is a resource, the capacity of innovation, that costs, but the access is easy from the financial point of view. It is a resource that term, more brains being brought together.

The innovational process is not unleashed on command and there shouldn't be expected to provide great results all the time. The tries for making something extraordinary, different, great reduces the value of the small differences, and that shouldn't happen, because these small differences such as changing to the LED bulb from the incandescence bulb is also an innovation. Anything that leads to something better is still an innovation, a sum of small differences can be better than a great innovation.

We must pay attention that not all the ingredients are put together for innovation. Europe has no resources, has no favorable demographic evolution and the population is old, the only things present are the brain and a better education. Changing the way of thinking in organizations is fundamental. The most important factor for the stimulation of innovation doesn't consist in money or in the support of the management but in the culture of the organization. The people need to be encouraged to apply their ideas.

3. What innovation means in times of crisis?

Today, even if the economic crisis has a negative impact on the businesses, most of the average and small companies from Romania, local and multinational, own a relatively important base of resources (human, relational, organizational) which can be used in the process of innovation and which begin to be lead

towards specific projects.

Of course, taking into consideration that the source of innovation is a new idea capable of bringing value, implication of the entire company in the process of generating the best ideas is a must and a active step of the most innovative companies in the world. But in what concerns the innovation in medium and small companies, a major opportunity lies into a better administration and capitalization of the employees' ideas. Such an initiative imposes a strategy for the innovation management and a rewarding system for the employees in order to encourage the innovative behavior. Of course, the benefits upon the competition are huge if we take into consideration a long term perspective.

The last years are witnesses for the fact that the success of organizations depends on their ability to adapt quickly to the market changes- to those resulted from the technology development and also to the major influences of the global level. So, more and more organizations stresses out the innovation. Nevertheless, in order to make a difference is needed that this to be part of the belief of the organization, and the ones who represent the leadership of those companies to truly belief in the innovative and creative spirit of the people from their companies, and also to support and develop on long term the innovation.

A top innovator is hard to label, but the one who has an idea that is supported by the consumers which changes the way things go could be an indication to success. Innovation can be given by genius ideas, generated in a short period of time, but the ones who really succeed to be labeled top innovators are the ones who have continuity in this, so they manage to re-invent each time and to change the environment where they activate. So, the organizational culture of these people has a pylon innovation and the creative spirit, and this culture is present during a long period of time.

Innovation is not a process that has a beginning and an end, but this doesn't mean that it shouldn't happen in an organized manner, with a degree of strategy. It must be mentioned that innovation doesn't have an end, there is also an aspect that can bring value, or even a whole new thing that could replace what was there before. But a defining element for innovation is that it must be tested by a great number of potential users and this process must have an end and a conclusion as soon as possible in order to evaluate its degree of success or failure. The failure of an idea doesn't have to demobilize that organization but to make it stronger for refining what can offer in the future.

All these lead to a try of quantification of the resources involved in innovation. Even if the creative spirit can't be put into default shapes, the practical and analytical feature of innovation must contain elements and resources of time. That is the reason for what the allocation of budgets can stimulate the innovation showing on this way the importance within the organization, but it has to be counterbalanced by emphasizing the results. This thing will show the degree of success of the initiatives that took place and it can be a deciding element in the analysis of the future actions.

Citing John Sviokla (2011) with his article "Sticking the Innovation Balance", I mention six tension points as being defining for the organizations to succeed in imposing themselves on the land of innovation, but it is not a scientific formula. So in the lines below, it is presented a mix regarding how the six tension point can lead to the desired success:

Incremental or radical innovation?

Incremental innovation comprises all basis elements for innovation, such as: modification, refining,

simplification, consolidation and improving the products, the processes, the services and the activities of production and distribution already existing. Most of the innovations are comprised in this type of innovation, and the importance of it shouldn't be minimized in any way.

The attention with this type of innovation should be directed towards the various versions of the Sony Walkman or even closer to the reality is the example of the most of the cars existing on the market and which from one year to the other are improving their features regarding the security, proficiency, comfort.

In this case of innovation, the improvements are successive and the versions of the products, services or processes don't represent all the time elements of novelty.

The radical innovation implies the inserting new products or services that are developing into a new business. This type of innovation can create a new industry or it can cause major changes in a whole industrial branch, tending to create a new system of values. Eloquent examples would be represented by "banking" with all the electronic transfers, cards, ATMs.

Management or Leadership?

According to Kotter (2008), leadership and management are two different and complementary action systems, each of them having its own functions and features. The junction of the two domains can become a major premise of success in a business environment that is more and more complex and changing.

Even if there is no ideal formula for the combination of the two, one fact is incontestable, the true challenge consists of the combination between a strong practice of a leader with a strong management, and doing so with keeping the balance.

In what concerns the difference between managers and leaders, many authors tend to accept the distinction made in 1954 by Druckner (2007), who stated that management means to do the things right, and leading means to do what is needed.

Even if along the time efforts were made in order to limit the differences between the managers and the leaders, in the last years a bond has been created between the two positions. The most probable, the difference between the concepts of the management and the one of leadership will exist only in their definitions, taking into consideration the tendency to encourage the managers into considering themselves leaders.

Short terms results or long terms commitments?

Despite the things that experts state the organizations don't have to tolerate failure if they want to innovate. But the problem is not fully represented by tolerating or not the failure. Sooner, it is an issue of approach and managing the failure that can appear no matter if it is regarding the long or short term results. Certainly, any organization met on it way at some point less favorable results, but the truly innovative organizations are the ones which no matter the results obtained on short term, or the commitments on long term, knew to manage their results in a manner that makes the success inevitable.

Must be considered that the primary mission of an organization aspiring to a quality management is to meets the needs and desires of its customers. Organizations should be aware that short and long-term survival is possible only by adapting services to customer needs (îu et al. 2011).

Innovation as an "open circle" or an investment of the organization?

The approach of the innovation as an open circle represents the choice made by some of the managers of the companies that are nowadays on the market. The principle that guides them is "no one is smarter than everyone" and by guiding upon it, it implies in their evolution many people from clients and distributors to partners. An example of company that acts according to this principle is Protecter and Gamble. Their perspective is oriented towards the approach according to which "the consumer takes all the decisions", and this thing helps them to follow and come to meet the always changing needs of the clients.

To the opposite part are the companies which choose to be more restrained in what concerns the innovation activity. The openness of them towards collaboration and sharing ideas is limited to the potential wins which would come from these actions.

Organic developed innovation or the acquired innovation?

The great companies tend to buy what they can't build. Even if it is about strategic knowledge or the position on the market, many times it is easier to purchase than to build it from ground 0. A successful example of purchase is the buying of YouTube by Google.

Even if the action of purchasing is seen as a bridge to success, there are many cases where the acquisitions proved to be an impediment into achieving success.

One process of innovation- or two?

The final challenge and probably the most difficult is to determine if an organization needs one process of innovation or two of them. The experts' opinion finds impossible that the same people, the same investment board, or the same set of partners to create incremental innovation and radical innovation at the same time. Or at least the chance is very small.

4. Intangible assets, profit source for companies

The innovation within the Romanian companies it is on an ascendant trend and ones of the organizations are really taking ahead comparing to others, being capable to compete on innovative themes on a global level. Nevertheless, the great challenge for the business environment and for Romania will be the capability to maintain this innovative spirit and to keep the supplement of value from the creative process, from the perspective of the intellectual property and also of the afferent financial resources. Therefore, there must be taken measures of supporting the innovation, or continuing with the already existing ones, even more aggressive comparing to the present, measures that can be taken in the educational, financial and fiscal environment, but also to the level of every company in order to support the innovation and creativity.

The multitude of methods, models and techniques of recognition and measurement of the intangible assets is determined by the complex, special and diverse typology character of them. A first criteria of classification, analysis of the methods targets the sphere the comprises the intangible assets, which imposes to be made the difference between: the holistic method and the atomistic one. The holistic methods suggested in the special literature and the business practice are: IC- IndexTM, Market-to-book Value, Tobin's Q; VAICTM; Knowledge Capital Earings (profits obtained from the knowledge based capital); EVATM; Calculated Intangible Value; IAMVTM; AFTFTM.

The atomistic or partial method assumes the analysis and the evaluation of a single intangible asset. The atomistic methods used are: Value Chain Score BoardTM; Scandia NavigatorTM; Balanced Score Card; Intangible Assets Monitor; Human Capital Intelligence; Citation- Weighted Patents; HRCA; Inclusive

Valuation Methodology; Technology Broker; TVCTM; The Value ExplorerTM; Intellectual Assets Valuation.

From the point of view of determination the intangible assets, in valuable and non-valuable terms, the specific literature proposes monetary and non monetary methods.

The non-monetary methods that approach the intangible methods in the terms of the quality analysis are: Value Chain Score BoardTM, Intangible Assets Monitor, Balanced Score Card, etc. The monetary methods are for example: Market- to – book Value; Tobin's Q; Knowledge Capital Earnings; VAICTM; EVATM; Calculated Intangible Value, IAMVTM, AFTFTM etc.

In the economic practice, there are 8 methods that are frequently used. Four monetary and holistic methods: Market- to-book-value, Tobin's Q; Economic Value Added (EVATM); knowledge Capital Earnings proposed by Lev B., but also four non monetary atomistic methods: Skandia Navigator (Edvinsson & Malow); Intangible Assets Monitor (Sveiby); Balanced Score Card (Norton & Kaplan); Value Chain Scoreboard (Lev B.).

From the point of view of the strategic management of the firm, the experts present the following groups of methods that basically mean a re-grouping of the earlier presented methods. Methods based on the exchange capitalization: the coefficient (rate) Q of Tobin (Tobin's Q); the indivisible balance sheet. The Q coefficient of Tobin is the ratio between the market value of a marketable company and the replacement value of her substantial assets. The indivisible balance sheet is the difference between the market value of the firm and net asset value. But also the methods based on the return of the assets: The economic value added (EVA); The Market Value Added (MVA); value added (EVA) reflects the residual net profit or the existing profit only in the case the difference between the profitable invested capital and the average weighted costs of the firm is positive. The calculation formula is the following: EVA= (ROIC- cmpc)x, the initial value of the of the invested capital , where ROIC= the rate of profitability of the invested capital; cmpc= the average weighted cost of the capital.

The market added value (MVA) is calculated as the difference between the market value of a company and the subscribed capital, credits and unshared profits. The capitalization of the profit generated by knowledge is calculated as a report within the difference between the normal annual net profit and the afferent net profit of the substantial assets and the current ones, on one side, and the rate of afferent capitalization in knowledge.

Score based methods: Skandia Navigator; Balanced Score Card; Intangible Assets Monitor; IC Index. These methods are based on the scores given by the assessors and does not quantify the monetary value of the intangible assets.

Direct methods of calculation of the intangible assets: Technology Broker, Inclusive Valuations Methodology. The estimation of the value in what concerns the intangible assets is made through these methods, through information and non monetary evaluations based on quizzes or on special frames of the updated cash flux.

Every organization should identify and describe the intangible assets that are crucial for the potency of the competition power of that organization. But in the same time there must be taken into consideration: the strategy of the firm, its consistency with the external environment, the business model of the company but also the most important resources in order to choose the business plan.

One of the most important aspects to take into consideration is the actual tendency of the firms to rely on

the intensive knowledge and on the valuing the new ideas that lead to innovation. In the current phase of the economic life, the businesses can be built around a pattern of thinking and not around a pattern of products and services given. For an organization to be efficient, the problem to question is the one of the efficient allocation of the resources and also the transformation of the intangible assets in economic value. Eventually, if the products and the services are put aside, the competition on the market would take place in terms of intangible assets.

For each type of intangible asset, the organization must answer to the following two questions: "Is this intangible asset relevant for our organization regarding the competition?" and "Is this intangible asset available for our organization?"

Once these aspects are clarified, the next step is identifying and describing the intangible assets which are relevant to the competition. All these activities have as purpose to deliver the external audience a credible and significant image of those intangible assets which are important to the competition success and therefore, can be appreciated for the financing decisions. More accurate, there are pursued to be identified an described the intangible assets that:

- Are available to the organization and have a role in the accomplishment of the business plan/ model;
- Aren't available and have no significant role in the making of the business plan;
- Are accessible for the organization but have no role in the present business model.

In this context four groups of relevant intangible assets from competitive point of view can be taking into consideration: human resources, intellectual property, organizational capital and relational capital. Every part of this group is made from four to six intangible assets (see table 1).

Table 1. Competitive relevant intangible assets

Human Resources	Intellectual Property	Organizational Capital	Relational Capital
Entrepreneurship	Encoded knowledge.		
experience	Data bases, procedures and handbooks		
Methods/ procedures/ for production/ providing services			
Attract the consumer			
Education and competences of the employees			
Business information.	The change and secret of the business		
Accreditation	Management of the clients' portfolio		
Know- how and tacitly knowledge			
Certificates/ patents and inventions			
Instruments and systems of project management			
Providers management			
The motivation and loyalty of the employees			
Trademarks and brands	Administrative system	Cooperation and networking	
Designs and models Author rights			

Behind these groups of intangible assets we find markers which can be analyzed in an economic- financial context in order to contribute to the development of the organization. The markers, analyzed in concordance with the phases of management proposed by the European project of research "EVLIA- Making full value of good ideas by leveraging intellectual assets for financing SME's in SEE", are creation, function, planning, transferability and they can contribute to outline a successful strategy of success that ensures the continuity of the organization on long term (see table 2).

Science, technology, innovation are domains that generate a continuous technological progress, providing the durability of development and the perspective economic competition. Also, innovation and the technological transfer are solution for solving economic issues and for the permanent renewing of the necessary technologies, by connecting to the demands and pressures of a free market found in expansion within the process of globalization. That is the reason why the development and implementation of an unanimously recognized evaluation model of the intangible assets is a necessity if we take into consideration the benefits further created. But the organizations have to confront obstacles when they try to develop themselves. They are found in disadvantage when they must attract external financing if they can't find capital because usually they don't dispose of the performances or guarantees needed by the financial intermediates and banks.

Table 2. Types of indicators

The phases of management of the intangible assets	Description
Creation	How do you obtain the asset?
Functioning	How do you use the asset?
How does it contribute to the business model?	
Can we estimate as quantity the advantages that are provided?	
Planning	
How is managed the regeneration of the assets?	
How would we manage to obtain the asset needed?	
Transferability	
Is it the asset relevant for somebody else?	
Can we tax something for it?	

The problem is debated also at the level of awareness level for the trading value of the intangible assets by the entrepreneurs. On the other hand, even if the investors know the importance of the intellectual property strategy in ensuring the survival and the success of the company, for many of them these are found at the bottom of the list of factors that they take into consideration when they decide to invest and this thing happens because along the time, the intangible assets have been neglected. But there shouldn't be neglected the fact that the intangible assets are the most important assets that a company owns and taking into consideration their importance on the global market, it is easily understood the necessity of a demarche for establishing an identification methodology and evaluation of intangible assets. îu et all. (2014)

The EVLIA project suggests the developing of a methodology dedicated to financial and economic evaluation for the intangible assets of the SMEs in concordance to the financial entities. The purpose of this project

was to examine methods of approaching of this issue, implementing a standard methodology and testing its efficiency by involving the financial intermediates. The biggest obstacle in stimulating the interest and the activity in the financial section by intangible assets is the insecurity that surrounds the evaluation of the intangible assets. Business evaluation is regarded more like an art than as a science in many places. For example, the evaluation of a certificates portfolio or of trademarks for a brand is a challenge even greater because of the inherent uniqueness of the intangible assets and of the preoccupation for the possibility of transfer them from the original company. Welzi et all. (2013)

5. Conclusions

The intangible assets have become the main generators of income in most of the companies, even if they aren't entirely exploited to their true value. The clarification of their role in the system of creating value leads to the awareness of needing a better strategy in terms of organization and the need of a more aggressive management of the intangible resources.

In these circumstances, the success of the companies doesn't depend on the production facilities or on the material capital that was the case years ago. Appropriate in this context is the statement of the regretted executive director of Coca- Cola, Roberto Goizueta who said: "even if all our factories and endowments would entirely burn over night, wouldn't succeed to affect too much of the value of the company; all this value resides, actually, in the trading fund ensured by the franchise of our brand and the collective knowledge thesaurus of the company". Kotler (2004)

In the same context, Peter Drucker states that "The firm has two- and only two – basic functions: marketing and innovation. Only the marketing and innovation are developing results- anything else is expenses". Kotler (2004)

In the Romanian context, even if there are a few theoretical works which approach the problem of the intangible capital and its importance, if we are to analyze the economic reality we notice that in what concerns the application of this information we still have a lot to do. We are already used, that in almost every field to be asked to change our "dusty" vision and to accept the new trend that guides the current society. Even so, taking into consideration the circumstances, we must adopt an action position and to give up chatting on the subject of capital matters for our developing economy. Regarding the intangible assets, these must be managed with great attention, and permanently developing them.

The intellectual products, information and knowledge, spiritual, scientific and cultural potential of the contemporary society are the motor force of a long term development and it determines economic competition. All these lead to the increasing of the intellectual property in the modern society.

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Management of Innovation Processes in Company

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Dr.N.K.Mishra

Abstract: Management of innovation processes in company is the field of innovation management which is still not enough researched and applied in practice. Managers in companies often do not know about modern techniques and design tools for creating innovation processes and also as about the possibility of their effective usage for management and effective usage in decision-making conditions. The purpose of this study is following a detailed analysis of literature and realized research to create a model of innovation processes management in the company. There were used different methods by solving the defined problem, for example: content analysis - the study of documents, synthesis, comparative analysis, process analysis, statistical analysis, modeling, programming, empirical research methods and others.

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Keywords: innovation, innovation process, management, company, research

1. Introduction

The main aim of the paper is to acquire new knowledge in the field of innovation management that are focusing on the area of innovation processes and highlight the possibility of managing of innovation processes in business. The proposed model is intended to serve as a control tool during achieving of performance of innovation processes in company. The aim is to give business managers a tool for innovation processes management.

In order to address the points in question, as set by this article, it was necessary to use several methods, depending on and fitting to the character of the individual parts of the solution. In order to accumulate necessary data, we used the method of document analysis (for analysis of current as well as historical data about the topic), a questionnaire method and a method of semi-structured interview (gathering data in an empirical research) and a method of observation (used during visits of selected companies). The methods used for further data processing were induction, deduction, synthesis, abstraction and modelling.

2. The Current State of Dealing with the Issue

Innovation process can be considered on the base of scientific literature analysis as an organized and controlled sequence of activities where inputs in form of innovation ideas are transformed into outputs in form of innovations. It is a process of recognizing customer needs and innovation opportunities, generating innovation ideas and their elaboration, work with information and knowledge regarding innovation, realization of innovation activities and ensuring successful extension of innovation among customers.

Since new customer needs are created based on extension and usage of new product, an innovation process can be understood as a repeating process. Furthermore the number of innovation processes is not limited. Innovation process has also a built-in mechanism of learning, i.e. a mechanism evaluation of incurred failures and deviation in each phases of the innovation process.

Mechanism is supported by feedback in each phases of the process. This mechanism is also supported by its openness which allows the company to adopting innovation ideas, necessary licenses for research and development from the external environment. I in the case of non-utilization own innovation solutions, it should to offer these solution to other companies, in the base of license.

On the base of the detailed analysis of the various approaches to the innovation process management in the company by various authors as well as the evaluation of the practical approaches can proceed to the systematization of lessons learned. This is a summary of the main benefits of different innovation process models that provide resources for the creation of a comprehensive model for the innovation process management. (Table 1).

Table 1. Benefits of different models of innovation processes.

Author(s)	Emphasis	Fortification
Imai et al. (1985)	Functional Integration	Integrated innovation process
Rothwell (1994)	Electronic data processing	Information assurance of innovation process
Dvoøák et al. (2006)	Feedback & Creative activity	Cross connection of innovation process
Vlèek (2011),		
Mol & Birkinshaw (2006)		
Needs		
Dissatisfaction with status „quo"		
Needs / dissatisfaction as the main launcher for innovation process		
Bernstein & Singh (2006)		
Manifestation of management (control element)		
Organization of the innovation process for site management		
Tidd et al. (2007)	Timing & learning	Innovation process base on a continual improvement
Skokan (2004)	Systematic approach Role of environment	
Innovation system (national, regional)	Local innovation process	
Chesbrough (2003)	Level of openness	Bounded (closed)
Unbounded (open)		

3. Situation in Slovak enterprises – results of the empirical research

Between October 2012 and January 2014 we conducted a research, with the primary goal to gather and interpret information about the level of use of innovation processes management in the environment of Slovak enterprises. In total, 321 managers of small, medium and large enterprises took part in the research, from companies active in Slovak republic.

Most businesses (257/80.06 %) generate innovative ideas to the identified customer requirements. However, a large number of businesses (186/57.96 %) do not take a proactive approach to generating innovative ideas and create them just in case there is a problem already. Ideas are generated randomly according to 29 businesses (9.03 %) and they are not created at all in 19 businesses (5.92 %).

Innovative ideas are not being recorded by any information system in more than 61.28% of the companies in Slovakia. Out of the 28.96% that do use information systems, about 75.23 % have created their own information system. In addition, in Slovakia, 16.72% of companies are using a system to record ideas that is provided by firm Salesforce.com.

4. Management of innovation processes in company

Management of innovation processes in company is a real problem, which are managers of the company faced. Number of factors participates in its provision, from theoretical concepts, through model solutions to practical applications. The biggest or the most significant problem can be seen in an absence of unified, or complex and at the same time transparent management innovation processes model in company. It can be said, based on the results from realized research, that on the present many companies try to manage their innovation activities and processes intuitively. However, companies must often solve various problems caused by their unpreparedness to manage innovation processes. A requirement to create a comprehensive and transparent innovation processes model, which would be a significant aid for managers, resulted from interviews with several representatives of companies within realized research. The benefits from this model would appreciate not only managers, but also customers, because their communication with company related to preparation and assurance of products and services by fulfilling customers' requirements and needs. This can lead to the elimination of a number of problems both from companies and its customers.

A management innovation processes model in company (Figure 1) was designed on the basis of views of various authors dealing with the issue of creating a model for managing innovation processes in the company and also after careful analysis of mentioned approaches to the development of innovative processes. Solution is based on a management of innovation portfolio model according to Hamel (2002). His definition of innovation has two approaches. First it represents competences that need to be built, and second it is a process that needs to be implemented in company. Therefore is model made up from two main parts, specifically:

- *innovation process,*
- *innovation competences.*

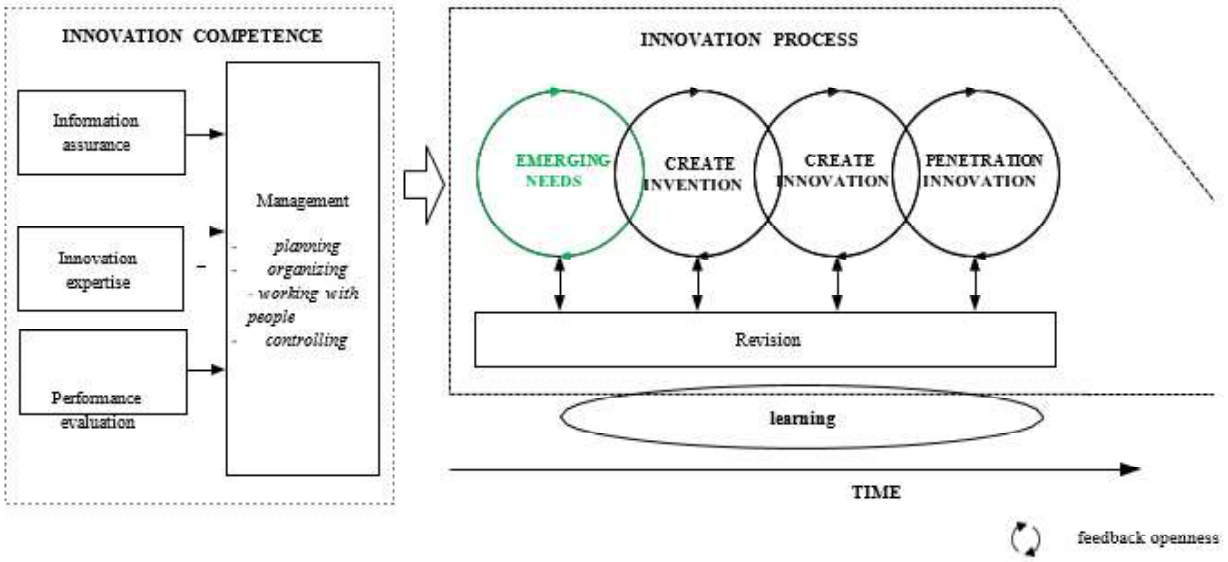

Fig. 1. Management innovation processes model in company.

Innovation process is a sequence of activities aimed at creation and implementation of innovation. It includes activities related to generating innovative ideas, their evaluation, creation of innovation and ensuring its spreading among customers. A transparent model of the innovation process was developed to better understand its singe phases. It is based on the basic model by Zaušková and Louèanová (2008). However, it is enhanced by identified key elements. Specifically, it is about adding the first phase of the innovation process aimed at *creating the need, or dissatisfaction with the status "quo".* Need, or dissatisfaction is perceived as the main trigger of the innovation process. This fact was highlighted by authors Vlèek (2011), Mol and Birkinshaw (2006). Furthermore, in the innovation process is regarded the degree of openness, of which importance noticed Chesbrough (2003). It is a boundless innovation process that allows flexible work with innovative ideas, which come to the company both from the internal and from external environment. Company can offer unused innovative ideas to other businesses by licensing, and vice versa, if necessary, it may acquire innovative ideas from external environment. Next element is *feedback*, which is highlighted in the innovation process. It allows to overcome problems accrued in the various stages of the innovation process. This is an approach proposed by Dvoøák (2006) in a form of chain links in the innovation process. Innovation process takes into account also the element of *learning*, which should contribute to a continuous improvement of the process. Tidd (2007) considers learning as a critical point in the management of innovation. Company can learn through the procedure in the innovation process and thus improve its management methods.

According to Hammel (2002) innovation competence are understood as a tools which allows company to use in innovation process management innovation tools, supported communication and information technology, management processes and appropriately to establish criteria for measuring the success of the individual phases of innovation projects:

- *innovation expertise,*
- *information security,*
- *management (planning, organizing, leading people, control),*
- *evaluation of the level of innovation processes management and innovation performance.*

On the base of the proper usage of various management functions (planning, organizing, leading people

and controlling) the innovation process should be effectively managed. The communication is important role in this process. An essential foundation for the successful management of innovation processes in the company can be considered an effective system of information security innovation processes. Another innovation competence is innovation expertise. It is necessary that the company management is supports the creative human potential. This means that employees how to fully use their skills and capabilities to ensure the innovation process.

In order the innovation processes should be managed effectively it is necessary to report some results in fields which affect to the management of innovation processes. Every company has a different level of management of innovation processes. Therefore, it is necessary to identify in the first step the current level of innovation process management in the company, then discover weaknesses and make recommendations for their improvement. It is necessary to build up an appropriate methodology for evaluating the innovation process management in the company.

2. Discussion

Management of innovation processes in the company is a challenging task for managers of the company. There can be a lot of causes of innovation process management failures and they have a different character. For example, there may be a lack of innovation expertise, failure to secure the flow of information in a company, insufficient training and motivation of employees, etc. Reasons of innovation process management failure affect several actors. Firstly, it is about managers in case of the lack of innovation activities in the company, company employees who are passive in participation in the innovation process and customers who are not interested in providing some added value.

Management of innovation processes cannot be implemented intuitively only on the base of evolution of the situation. It is a complex process with a lot of aspects: the state of innovation potential, constructed IT infrastructure, evaluation system of employees and organization arrangement. Effective management of innovation processes should identify weaknesses (gaps) and take measures to eliminate them. It should also be able to bring information related to innovation to responsible persons. Company should be prepared to face some risks that can occur and cause failure of the implemented innovative projects. If the company identify risk soon and prepare for them, then there can be increased the probability of successful innovation process management in the company.

The following recommendations should help to reduce the occurrence risk of identified problems. It should help to company managers in the management of innovation processes as well as prevention of the occurrence of problem situations. Managers of businesses may be recommending: (Lendel and Varmus, 2014).

- · *overhaul of corporate strategy in order to include product and process innovations,*
- · *the allocation of sufficient resources (human and financial) to innovate and search,*
- · *introduction of a transparent record of innovative initiatives, ideas and innovation,*
- · *the establishment of pro-innovation climate for the development of innovative ideas, creating space for open discussion of innovative ideas and work in teams,*

· *create a mechanism for selection of appropriate innovative ideas in order to avoid duplication and loss of innovative ideas.*

6. Conclusion

The design of model of innovation process management in company is possible to consider as a main result

of analysis. In the solving of defined problem were identified key innovation competencies (innovation expertise, information security, management and performance evaluation) and main difficulties of innovation process management in terms of Slovak companies (empirical research realized by authors). Valued results of this study are also formulated recommendations how to correctly manage innovation processes in a company.

As a main conclusions can be mentioned: Management in company is important in the field of innovation processes management. A key assumption for the successful realization of the innovation processes is the existence of a supportive environment for innovation creation. For managers can be recommended to implement and use the system of self-evaluation of innovation processes in company.

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Strategic Management of HRM Practices and Innovation Performance in the High Tech Fiberglass Sector in India: Mediating Role of Organizational Innovation

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Abstract: Growing use of fiberglass admixture in construction along with automotive industries has escalated demand of fiberglass among the firms and fueling them with the innovational strategy in order to be competitive. Fiberglass businesses being one of the high-tech sectors have to consider many domains. Although, due to the inflexibility of employees, the absence of innovative atmosphere and monopolistic composition, employees are unwilling to be innovative in organizations. The current study argued that strategic management of new HRM practices through enhancing more skillful, talented, committed, motivated can further innovation and innovational employees that helps in higher productivity of the organization. However, to demonstrate this connection is insufficient in terms of empirical evidence. Consequently, the main objective of this investigation to examine role of strategic management of New HRM practices on innovation performance followed by the mediation of organizational innovation. Data has collected from Bahrain's manufacturing sector of fiberglass that came up with significant positive association between the endogenous and exogenous variables.

Keywords: *Strategic Management; HRM Practices; Organizational Innovation; Innovation Performance; Technology Organization Environment Theory*

1. Introduction

Intense globalized competition among manufacturing organizations has been generating challenges that are more innovational. Due to autocratic and anti-competitive power of services suppliers, state and public government have not recognized the compulsion of innovatory policies (Park *et al.*, 2018). Due to substandard HR policies of the incentive system and rewards employees are resistant to behave efficiently that is an alarming situation for firms. The current study argues that the concept of strategic management can significantly help enhance organization's capability in handling any type and length of tasks. Scholars have underlined that strategic management of businesses can significantly help them to improve their business operations for a greater good (Barney & Hesterly, 2010).

Although over the past decades, whole world has been surrounded with innovative strategies that lifted up transformation in government organization. State-owned firms are in state of need to perform productively and competently like private sectors. Thus, to complete this government are also striving to implement those innovational strategies that strengthen the innovational performance through employing talented &skilled personnel, upgraded operating network and finest communication structure (Barney & Hesterly, 2010). Now a day's innovation has become one of the most significant subjects in fiberglass sector, as it is one of major revenues generating sectors. Past studies showed that old conventional procedures are less productive in the growth of employees' creativity and retention of efficient staff. Due to uncertain and rapid changes in

environment, firms need to reshape their business format, method and model to perform innovatively that helps in higher output of the organizations (Newman *et al.*, 2018). Globalization accelerated organizations to reconstruct their business format through executing new HR practices and assemble motivated, committed & quick-witted employees that promote innovational performance. Technological innovation among business environment is constantly growing the climate of organizations in multiple countries like Bahrain. Bahrain is confronting uncertain environmental conditions, instability and complications in business environment. In fact, Bahrain firms need to realize the innovational policy, climate unpredictability and inflexibilities to be globally competitive (Alzyoud & Ogalo, 2020). According to Global Index 2019, Bahrain stands at 78 rank out of 128 countries in terms of innovational output. Past studies have signalized the significance of innovational performance development and found that Bahrain striving to overcome innovation challenges in the fiberglass industry, and main grounds of slighter performing firms are due to lack of knowledge, in-depth training, new technology and fierce skills (Hitt, 1998). Both private and public sectors come in the semi-government organization that integrates components of the establishment along with private organizations. The government has the competency to control its operations and specify eternal or semi-eternal employment that take advantage of government machinery and administrative functions are being controlled by establishment (Cooray *et al.*, 2016). Innovational ideas has been experimented by employees of semi-state organizations since increased demand for transformation in pubic along with private sectors. Due to hierarchical nature, largely, government sectors are not in favor of buckle down new challenges and trends. Despite knowing globalized challenges, these organizations still executing old practices rather than implement a new innovative scheme (Ahmed *et al.*, 2018).

The success of any organization highly depends on constructive practices of with a strategic approach. This asserts that organizations should take great care and concern for all the business functions with an eye for the long-term prospects. Particularly in today‘s world, this has more meaning for business survival than anything else.

HRM and they act as triggered in achieving organizational objectives. Innovative, intellectual, smart and enthusiastic staff could attain objective and goals of any organization. In this modern era, sky- scrapping performance of an organization highly depends on new HRM practices (Farouk *et al.*, 2016). Intense competition among business showed that productive HRM is not any longer gratified and implemented with old traditional method (Kalleberg & Moody, 1994), as past studies examined and found absence of advanced HRM procedures the viewpoint of economic advancement and absence of international and government HRM standards. Hence, to be competitive globally it is demanded to formulate new HRM practices and semi-state organizations must strategically implement NHRM practices to be competitive. Organization must have to formulate HR policies that are flexible in nature that can adapt according to business climate. The manufacturing sector of Bahrain is growing gradually, and sector of fiberglass are imparting from traditional methods to NHRM practices (Chuna *et al.*, 2002).

NHRM practices has switched conventional methods to E-recruitment &selection, reward &incentives system, training &development, mutual teamwork, investing in employee’s health and engagement of employees in decision making that boosts up innovational performance (Farouk *et al.*, 2016).

Innovation performance can enhance by productive NHRM practices such as creativity in recruitment, holistic health benefits, talent acquisition, interviewing via video and fair evaluation system in terms of

reward and incentives. Literature declares that by implementing better NHRM practices manufacturing sector can enhance the engagement of employees towards innovational approach (Ahmed *et al.*, 2018). Previous studies found that organizational innovation could act as mediator for innovation in the performance of an organization (Urgal *et al.*, 2013). Scholars have been very zealous to determine the impact of NHRM practices on IP with mediating effect of OP in the semi-state organization. Due to the cutthroat environment adoption of emerging technology is an especially stimulating factor in the growth of organization. In previous studies researchers has utilized various theories such as resource based view theory (Das & Teng, 2000), human capital theory (Sweetland, 1996), the knowledge-based view (Eisenhardt & Santos, 2002) to explain the connection among NHRM, IP and OP in semi-government organization. Additionally, researchers declared that TOE theory (technology organizational environment) mainly relate to the innovation performance that overall boost up capability, competency, and creativity of organization. TOE theory implementation helps organizations to achieve sustainable benefits of innovational strategies and NHRM practices could be valuable, high yielding and exceptional for performance of innovation and organizational innovation. So the current study has used TOE theory to evaluate the framework empirically that links the studied variables NHRM, IP and OP while on the other hand NHRM practices has importantly affected innovation performance especially in manufacturing sector of fiber glasses. Even so, literature has spotlighted less discussion on such topics, especially in the manufacturing sector of fiberglass. NHRM practices could stimulate the organizational performance in of fiberglass sector. Furthermore, NHRM practices and innovation performance have discussed less. Scholars highlighted that further exploration are required between NHRM practice and innovation performance for more powerful results. Therefore, this investigation contemplates as deep-seated issue and a qualified research gap that in state of need to be addressed. Thus, ongoing exploration empirically investigated the role of organization performance as mediator between NHRM and IP in fiberglass organization.

2. Literature Review

2.1. Strategic Management

The term strategic management denotes the process of objective specification by an organization to establish policies and procedures to plan and allocate necessary resources for effective achievement in the long run. Strategic management has critical significance when it comes to business functions and their performance. Overall, strategic management provides a direction to each of the business functions to assist managers and decision-makers in finalizing the courses of action. Strategic management is also referred as the highest level of decision-making activity that influences literally every aspect of the business (Pearce *et al.*, 2000).

Strategic management is highly critical for organization to survive and this can only make considerable impact on their performance and responsive achievement of the objectives. Strategic management is an on-going process and it helps all departments and functional units of business to shape their plans and actions to ensure they are aligned with the broader business goals and strategies (Ansoff *et al.*, 2018). This continuous process focuses on consistently formulating and implementing board plans, organizational policies, setting objectives and providing a blueprint to all the departments to make their objectives tactical and operational plans for responsive functioning. In this, there is constant evaluation and cross-examination as well which greatly facilitates in ensuring that the business functions are right on track. Typically, strategic management goes with a comprehensive assessment of learning about an organization and its strategic

position (Freeman, 2010). This aspect is concerned about the developments in the environment and the likely influence of these developments on the business at large. Here, the strategic management approach to any given business function plays a notable role in furthering its actions with a long-term perspective. Taken together, strategic management aids to every business function ranging from marketing to human resource management.

2.2. Strategic Management of New HRM Practices and Innovation performance

Innovation performance is critical for business these days, which is why it has been receiving considerable scholarly attention in the recent past as many studies are focusing on it these days (Hult *et al.*, 2007). Therein, modification and restructuring of organizational strategies to manage the prompt transformation of innovational practices in organizations has increased much attention among researchers in past years. These rapid changes have forced firms to reshape their human resource practices and motivate employees to perform innovatory and give rise new powerful business environment. These NHRM practices are applying in different organizational processes like reward system, appraisal system, E-recruitment and selection, continual knowledge and Training and Development (Reeves & Ford, 2004). New human resource practices affect the organizational strategies as identified by researchers in past studies. In order to adopt rapid changes of environment and challenges, researchers highlighted that organizations must have to implement new HR practices that are flexible in nature (MacDuffie, 1995) Higher productivity in the organization has embellished in developing along with developed economies. Human resource processes has always been great concern towards the success of any organization and be a factor in achieving organizational objectives. Moreover, new practices and procedures are triggers for innovational ideas that are acknowledged by management and employees (Alegre *et al.*, 2013).

Innovative behavior of employees in terms of new human resource practices motivates innovation in organizations (Laursen, 2002). Past studies highlighted the importance of employee's performance with HRM processes and particularly NHRM practices could assist in high level of performance. Implementation of innovational design helps in building confidence of employees and leads towards innovational strategy in organization. NHRM practices provides assistance in achieving higher level of employees' commitment and ultimately enhance performance of organization. Effective HRM practices has great impact on innovation performance by encouraging employees (Prajogo & Ahmed, 2006). Moreover, the researcher provided evidence that NHRM practices could heighten the inspiration &competencies of employees and through the implementation of advancement in practices, firms can increase innovation in performance. Organizations practice new management style, technologies, the establishment of new products &services and formulate organizational competencies to deal with firms' risk and challenges. Moreover, innovation in performance leads towards healthier performance and market share of the firms. In past investigations, researcher emphasized to develop competencies along with expertise to strengthen the employment relationships and encouraged innovation in performance. Semi state organizations gained competitive advantage through change in innovational technologies (Laursen, 2003).

H_1: Strategic Management of New HRM practices are significantly related to Innovation Performance.

2.3. New HRM practices and Organizational Innovation

According to strategic HRM perspective NHRM practices are contemplate as significant in training and development of employees, skill development, competency behavior and creativity to achieve organizational innovation (Farouk *et al.*, 2016). Additionally investigators have credence that NHRM practices signified the contribution of new reward &compensation methods, T&D, e-recruitment &selection and innovation in performance explain personnel innovation in organizations (Waheed *et al.*, 2019). Innovation in organizational environment are in state of need to be continuity in development of innovative working environment, training and development of employees, enhancing skills, talent and knowledge of employees, execution of practicality of technology advancement. Effective HRM practices assist organizations to be highly empowered, innovative, motivated, sense of accomplishment, teamwork and autonomy in decision-making (Kianto *et al.*, 2017). For organizational magnification, NHRM practices plays considerable role as investigated in previous studies. However, organizational growth is related to NHRM practices such as E-recruitment and selection, compensation, and benefits, investing in health of employees, T &D, reward system and employment relationships. The performance of organization must be higher if they practice new human resource practices. Past studies have a conception of NHRM practices but have no execution in their investigations. Continuity in innovation and employee commitment in manufacturing sector motivate firms to practice new HRM practices in large, medium and small organizations (Ceylan, 2013).

Therefore, current study purpose to examine the contribution of NHRM on innovation performance. Globally implementations of new technologies in manufacturing sector are significant part in achieving organizational objectives. NHRM practices, OI and IP are key factors in creating of new products, ideas, systems, competencies and technological ideas. Innovation in organization reflects new ideas, products, services and initiates latest use of technology that promotes innovational performance (Ahmed *et al.*, 2020). Organizational innovation stimulates innovation in performance and contributes in sustaining competitive edge and advocacy of innovation at workplace helps in improving the performance and productivity of the firms.

Furthermore, OP is principally associated to four undertakings such as creative strategy, new manufacturing process and new development of product and growth of organization. Organizational innovation is considered a multi-tasked process containing. Implementation of new technology, ideas, strategies, methods and advancement in business processes promotes sense of accomplishment to employees and autonomy power of decisions also become more identified along with healthier employment relationships.

H_2: Strategic Management of New HRM is positively related to organizational innovation

2.4. Organizational innovation and innovation Performance

Innovation in organization is explained as execution of new ideas for improvement in business method, format, and procedure that boost up betterment of products, empower creativity, teamwork and promotes good employment relationships (Azar & Ciabuschi, 2017). Innovation in organizations leads towards growth and continuation of innovation in performance. Newly changing technologies, heavy innovational competition, and more complexity in business processing, advancement in the process, new innovational practical implications, and creativity in manufacturing forced firms to formulate organizational innovatory strategy. In past examinations, researcher has discussed more about the old conventional methods of

innovation in organization. Whereas according to other past studies related to organizational innovation if the organization not implement innovatory strategies and not prepare to adopt new ideas and trends in their processes than organizations will be less innovative and higher risk of slower growth that lead towards poor employer branding. To cope the market challenges and cut throat competition, manufacturing firms should have to implement new ideas in order to be competitive and dynamic. The innovational strategy is a comparatively new concept in the fiberglass sector of Bahrain. Innovation in performance refers to the implementation of new innovative ideas, methods and procedures. Innovation is procedure of practicing new process that enhances the performance of products and services (Prajogo & Ahmed, 2006). Past studies revealed that adoption of innovational strategy lead the way towards formation of new expertise and competencies and firms use these latest ideas in their products and production system, reshaping their procedures, HR processes and way of dealing customer services.

Restructuring of new products, new production ways, effective information communication resources, better customer services, new technological methods to gain competitive advantage comes in the innovational concept. For organizational magnification, NHRM practices plays a considerable role as investigated in previous studies. However, organizational growth is related to NHRM practices such as E- recruitment and selection, compensation and benefits, investing in health of employees, T &D, reward system and employment relationships. HR policies have huge role in the effectiveness and competitive advantage of the firms and most of the countries are striving hard to reshape their HR practices with new innovational HR scheme and Bahrain is one of them. Bahrain has been reshaping their business policies and transformed the old traditional procedures to latest practices in their fiberglass sector. Development and transformation in HRM practices leads towards innovational performance and higher productivity and these new (Shahzad *et al.*, 2017).

H_3: Organizational Innovation is significantly related to Innovation performance.

2.5. Mediating Role of Organizational Innovation

Innovation in performance is fundamentally development in HR procedures, customer services, operations and methods of manufacturing and betterment in existing products and services (Zhou *et al.,* 2013). Due to intense competition, external factors significantly affect to the performance of the organization and it could be overcome by pointing out significant skills and knowledge of employees that helps in enhancing business performance. Continuous innovation victoriously explains the expansion of existing services, technologies, policies and strategies of human resource management. It was significant to understand and determine the information by having the employee's knowledge about innovation strategies. Innovation in organization defines as creativity of new ideas, processes, techniques and operational processes that furnish firms with innovation in performance. Customers need fulfilled by the innovative organization and gain constructive outcomes and encourage staff to perform innovational, learn new skills, knowledge, technological invention and obtain higher recompense (Nouri, Ghorbani & Soltani, 2017).

Innovation is one of the effective technological channels for achieving sustainable competitive advantage because continuity of innovation leads firms to higher level. According to Farouk *et al.* (2016) contribution of organizational innovation influenced the performance of organization in terms of flexibility in innovation. Current literature of the study supported the theoretical framework and found in previous investigations that organizational innovation indirectly strengthens the relationship between NHRM practices and innovation

performance. Few studies demonstrated the contribution of innovation as a mediating role. Although past investigations have more focused on the effect of innovation on export performance (Yazhou & Jian, 2013). In Bahrain, the manufacturing sector is enormously growing that needs to be in state if innovatory so that is the reason to conduct proper investigation to measure those factors that greatly influencing innovational performance. Therefore following hypothesis are formulated

H_4: The association between Strategic Management of NHRM practices and Innovation Performance is mediated by Organizational Innovation.

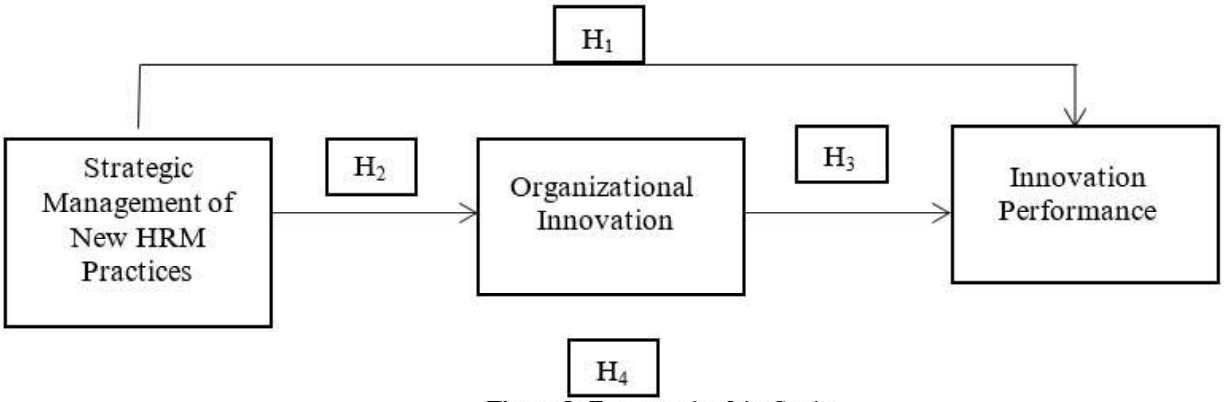

Figure 1: Framework of the Study

Innovation in business is very critical (Ahmed, Mozammel & Zaman, 2020; Ahmed *et al.*, 2019). Studied literature has furnished with in depth understanding of theoretical framework to further explain the concept that innovation performance is enhanced and supported by NHRM practices in the manufacturing sector of fiberglass in Bahrain. Based on previous studies of HRM (Farouk *et al.,* 2016) model of this study has formulated, and the structural model represents that NHRM practices and innovation performance is mediated by organizational innovation. The model of the present research is shown in Figure 1.

3. Methodology

3.1. Population, Sampling, and Data Collection Procedure

The objective of this study is to look over the effect of Strategic Management of NHRM practices on the innovation performance of Bahrain's fiberglass sector. The fiberglass sector was targeted and data were collected through questionnaires that were distributed and collected from mangers to represent the population of the entire targeted sector. To refrain from any errors, it is significant to have an appropriate sampling size. Calculate the appropriate sample size is very judgmental in research found by (Bartlett & Higgins, 2001). Two sampling technique i.e convenient sampling technique and snowball sampling technique was used to open the door for smoothness of collected data as proposed by previous investigations. To test our research model, 3 measures of construct new human resource practices, organizational innovation and innovational performance were used to test the hypothesis of the study. Before distribution of questionnaires to the targeted population, the informal interview has taken from top as well as middle managers of the human resource department to confirm the soundness of questionnaire. An appeal was made to managers during the interview to identify any ambiguity, unknowing turn of phrase or any trouble in the understanding of questionnaires for refining in readability. So, the questionnaires were upgraded based on this

recommendation and eventually distributed after approval from top management via proper email. Because of confidential matter, organization did not allow to personally collect data; thus, structured questionnaires were formulated, and the link of the survey was dispensed to employees by the human resource department via official email. Due to the error-free and high speed, online collection of data has recommended that was feasible for both researcher and respondents. Another reason of the online survey was the nature of employee's job as they were ineffective in responding during their long working hours. HR departments fully provided support for regulating good sense of communications with their respondents via official email and direct connection.

Questionnaires distributed among 1100 employees of fiberglass businesses in which 632 were authentic comeback in opposition to questionnaires that was distributed. The appeal was requested to point out the senior employees who had more knowledge and competency about the organizational research and development department because of the capability and proficiency of workers create more innovational reflection in organizations. Questionnaires comprised of two sections, one section contained demographic profile of the respondents (Managerial level, gender, marital status, education, age group, company name and period of employment in organization) whereas other section comprised of questions of studied variables strategic management of NHRM practices, innovational performance and organizational innovation. The demographic description is shown in Table 1.

Table 1: Demographic Profile

Demographics	No. of Respondent	Percentage
Gender		
Male	370	58.3%
Female	242	38.2%
Other	20	3.14%
Marital Status		
Married	378	60%
Single	254	40%
Age Group		
20–30	238	38%
31–40	155	24%
41–50	112	18%
51–60	69	11%
Over 60 years	58	9%
Organizations		
Awal	147	23.3%
CPIC	230	36.4%
Zarwan	145	23%
BFG	110	17%
Education		
Intermediate	90	14%
Bachelor	311	49.2%
Post Graduate	188	30%
MPHIL	38	6%
PhD	5	0.8%
Managerial Level		
Top level	107	17%
Middle Level	208	33%
Low level	317	50%
Tenure in Current		
Organization		
Less than 1 year	55	9%
1–3 years	122	19%
4–7 years	177	28%
8–10years	192	30%
11–15 Years	86	14%

3.2. Instrumentation

All items were adapted from previous scales that were validated scales. As targeted population were quite educated and had good sense of understanding so the established questionnaires were in English that created easiness and quickness of response from respondents. Despite of this some employees had little ambiguity; thus, questionnaires were also translated into Urdu to facilitate the employees in better way to get effective results. Moreover, to get the better generalizability and content validity of the results, 5 employees were selected who had basic knowledge about innovational policies in organization along with 6 senior executives to examine the content validity. More filtration and assessment were fabricated based on this process of feedback.

4. Analysis and Findings

To examine the relationship among strategic management of NHRM practices, organizational innovation and innovation performance and to ensure the reliability of data researcher has used SPSS version 21.0 to determine the cause and effect relationship of latent variables. Linear regression analysis has done to predict the value of variable that is based on another variable. Relevant previous variables were eliminated as prerequisite demand of the study and then interchange variables were established by growing them. Likert scale had multiple questions that were determined by Cronbach's alpha, to test the authentication of the questionnaire, higher the value of alpha means higher the authentication of the factors that signalized the internal consistency of the questionnaire. All item values were greater than 0.8 that shows the favorability of internal consistency. Convergent validity is measured through factor loading of items. For Confirmatory Factor Analysis (CFA), values of the factor loadings need to be above 0.70 (Hair *et al.*, 2017). In the case of exploratory research, it can be between 0.60 and 0.70 (Hair *et al.*, 2017). Convergent validity of the constructs in the study was evaluated by AVE. Values of Average Variance Extracted (AVE) should be above 0.50 for every construct included in the study (Hair *et al.*, 2017) and all values were above than 0.5. Because of composite reliability, the convergent validity was significant with ratios between ratios

0.5 and 0.6, thus confirming convergent validity. Discriminant validity measured through confirmatory efficacy and found that instrument contains higher discriminant validity. For validity of constructs and confirmatory factor analysis, software IBM AMOS 20 has used, and findings of model fitness showed the fitness of data as explained in Table 2. Model fitness has measured the contrast among many measurement models. Common bias method (CBM) occurs when data has collected through questionnaires and study was quantitative in nature so there was need to examine any variation in constructs that either might increase or decrease the chances of error. CBM conducted to estimate the relationship among theoretical constructs. For this common factor analysis (CFA) was performed to detect common method bias and CBM was detected by Harman's single factor analysis (Aguirre-Urreta & Hu, 2019). However, findings of the study show that whom attribute values were greater than 1, represent 69.5% of absolute variance. Furthermore, measurement of CBM explained 14.06% of variance that is less than 50%. Standard deviation, correlation and means of all 3 variables are pointed in table as follows.

Table 2: Loadings

Construct	Items	Loadings
Strategic Management of New HRM		Loadings
	NHRM1	0.77
	NHRM2	0.64
	NHRM3	0.80
	NHRM4	0.84
	NHRM5	0.67
	NHRM6	0.72
Strategic Management of New HRM Practices	NHRM7	0.61
(NHRM)	NHRM8	0.73
	NHRM9	0.62
	NHRM10	0.76
	NHRM11	0.81
	NHRM12	0.71
	NHRM13	0.65
	NHRM14	0.68
	NHRM15	0.77
	NHRM16	0.81
Innovation Performance		
	IP1	0.76
	IP2	0.82
	IP3	0.80
	IP4	0.81
	IP5	0.77
	IP6	0.83
	IP7	0.84
Organizational Innovation		
	OI1	0.72
	OI2	0.82
	OI3	0.75
	OI4	0.66
	OI5	0.60
	OI6	0.71

Table 3: Descriptive Statistics, Reliability, and Correlations

Var.	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
Gender	0.69	0.48	1										
Marital status	2.07	0.57	0.18	1									
Age	30.26	6.79	0.14**	0.31	1								
Semi-govt			0.16	0.33	0.17								
Organization						1							
Education	3.047	0.69	0.04	-0.27	0.12	0.06	1						
Managerial Level	1.90	0.51	0.05	0.16	-0.13*	0.11	0.14	1					
Present Org. Tenure	5.07	4.47	0.12	0.15	0.15	-0.19**	0.81**	0.15	1				
NHRM	5.02	0.66	0.05	0.07	0.07	0.12	0.04	0.21**	0.18	1			
OI	4.65	0.45	0.04	1	1	0.09	-0.04	-0.03	0.10	0.24**	1		
IP	5.62	0.75	0.18*	0.13**	0.13**	0.20	0.15	0.11	0.14	0.12**	0.20**	0.28**	1

Findings showed that strategic management of NHRM was positively associated to innovation performance $p<0.01$, $r=0.13$) and organizational innovation ($p<0.01$, $r=0.23$). Both OI were IP are positively be in agreement and findings of both organization innovation and innovation in performance were positively corresponded ($p<0.01$, $r=0.20$) that describing the true relationship among the studied variables. Path coefficient is a statistical multiple regression analysis that determines the cause and effect relationship and investigation signalized that new human resource practice was positively related to organizational performance, and this was advocated by H1. In table 5, regression analysis authentication is depicted. However, to measure the mediating role, this study has used Baron and Kenny (1986) technique for testing.

Table 4: Hierarchical Regression Analysis: Organizational Innovation and Innovation Performance

	Innovation Performance		Organizational Innovation	
	M1	**M2**	**M3**	**M4**
Gender	0.04	-0.07	0.04	-0.02
Marital status	0.01	0.06	0.05	0.03
Age	-0.10	-0.09	0.08	0.02
Semi government				
Organizations				
Education	0.10	0.06	0.09	0.03
Managerial level	0.12	0.08	0.04	0.05
Present Org. Tenure	0.09	0.11	0.07	0.02
NHRM	0.19***		0.03	0.26***
OI		0.23***	0.20***	
R2	0.23	0.27	0.19	0.33
Δ R2	0.13	0.17	0.08	0.25

As stated by the test, the following four steps are required. In the first two courses of action, IV must have a significant association with DV and mediator. In step third, mediator should have significant association with the DV. The concluding step reveals that the influence of IV should be slight on DV when middleman incorporated. Findings of the investigation demonstrated that NHRM is highly noteworthy predictor of innovation performance ($p < 0.001$. b=0.17); NHRM is highly noteworthy predictor of organizational innovation ($p < 0.001$, b = 0.25); Organizational innovation is highly noteworthy predictor of innovation performance ($p < 0.001$, b=0.22); and impact of NHRM practices transferred into insignificant (b=0.03) when OI reverted simultaneously in between OP and NHRM practices that depicted complete effect of mediation. However fourth situation came as inconsistent because of less coefficient. In such manner to underpin the inconsistent situation, current study has observed the recommendations of previous investigations. Low coefficient of 0.02 were accepted according to (Huang *et al*., 2018)

5. Discussion

Strategic management of NHRM practices plays a tremendous contribution in innovational trends that have been followed by the fiberglass sector in Bahrain as well in rest of the world since many years. New human resource practice generates positive and beneficial effects on innovation performance and undoubtedly organizational innovation strengthens the relationship between NHRM practices and innovation performance in the context of the manufacturing sector in Bahrain. All tested hypothesis supports and strengthen the relationships among studied variables that were taken for empirically tested statistical analysis and all hypothesis out-turn positively supports the previous investigations. Result of the first hypothesis concluded that there is stronger relationship between NHRM practices and innovation performance which is in alignment with previous findings (Farouk *et al.*, 2016). Organizational innovation was also found significant as mediator to help understand the association between strategic management of NHRM practices and IP in previous findings and this exploration-established evidence that OI is correspondingly beneficial in IT sector as well as an important role in manufacturing sectors. In this competitive era fiberglass sector must have to gain and sustain a competitive edge in terms of new human resource practices that leads towards innovation in the performance of employees together with organizational performance. Consequently, studied literature

contributed positively to the impact of NHRM practices on innovational performance

5.1. Theoretical Implications

Framework of the current study is rooted on the strategic management of new HRM practices, innovation performance and organizational performance. To examine the connection between NHRM and IP, OP researcher has empirically tested the relationship through 632 responses in the manufacturing sector of fiberglass. Three significant implications: for better understanding, we have discussed deeply about the role of NHRM practices on innovation performance in the fiberglass sector. In past investigations, scholars contributed paid less heed to NHRM processes; neither focused on role NHRM practices nor studied the direct impact of NHRM practices on innovation performance. Due to globalized competition, firstly researcher has talked about the contribution and impact of New HRM practices performance of innovation in the fiberglass industry with the help of technology organization environment theory. Secondly, this study inaugurated organization innovation as negotiator between NHRM and innovation performance to look over effects of mediating contributor. Other perspective of this paper uncovered fact that without execution of new HRM practices fiberglass sector cannot nourish innovational attitude.

Hence, for stronger effect and outcome, organizational innovation can be considered as compulsory for growth and development of organizations. Considerably researcher has examined the direct effect of NHRM practices on IP along with the mediating effect of organizational performance. Eventually this investigation added up new consideration of strategic NHRM procedures on innovatory performance. We scrutinized that organizational performance boost up the relationship between NHRM and innovation performance and make connection positively stronger.

5.2. Managerial Implications

This study has implications for managers and policymakers. The findings suggest focusing on new human resource management practices with a strategic perspective to enhance innovation performance in the fiberglass sector in Bahrain. Upshots of organizational performance act as mediator between NHRM and innovation performance that helps to tackle new emerging technological challenges and trends. Organizational performance observes environmental threats in terms of resources and overcomes the uncertainties in demands. Managers should keep focused on gaining a competitive edge through new human resource measures for healthier innovational performance in the fiberglass sector to meet emerging challenges. Managers should understand the changing trends so it would be superior to find the newest mechanism of innovation performance. Furthermore, managers must have to ensure the implementation of NHRM practices in their organization, strive hard to encourage new expertise, talent, and competency and eliminate obstruction in way of success and enhance the working style of management. Consequently, to encourage employees, firms must have to execute NHRM practices so that they could perform higher and leads the organization to an optimum level.

6. Conclusion

The current study shed light on the aspect of strategic management and how it can be of acute significance for the businesses large. Therein, the study attempted to investigate how strategic management of new HRM practices can help enhance innovation performance following the mediation or organizational innovation. The study has forwarded critical insights on the topic for scholars enthusiastic about strategic management of different organizational activities and initiatives.

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The impact of entrepreneurship and innovation on developing the marketing strategy in business organizations -An Analytical Study-

Dr.Praneeta Sahu

Abstract: Entrepreneurship and innovation are considered among the main characteristics of strategic thinking in business organizations today because of their complicated effects on designing and executing the different activities of such organizations, especially the marketing activities which constitute the core of all other activities. In this context, many researchers confirm that the two vital tasks that should be undertaken by top management is marketing and innovation, both are interdependent and interrelated. Innovation is a vital key to the organization survival at the top competitive level and in helping create marketing leaders.

The compatibility between entrepreneurship and innovation create marketing strategies that are characterized by entrepreneurship and innovation, such strategies involve innovative methods that transform existing products and services into new ones with high quality that adds value to existing businesses.

Entrepreneurship is the process of seeking and utilizing opportunities available in the business environment or those opportunities realized through innovation to create value to business organizations.

The economics war at the present is "the war waged to create talents", innovation. This means that the organization must be entrepreneurial in strategic planning for its marketing activities through making use of all innovative ideas and methods that secure its competitive position in different markets.

The objective of this study is to clarify the concepts of entrepreneurship and innovation as being two compatible concepts, and to show their relationship to developing successful marketing strategies in a business environment which is exceedingly quick and dynamic in all aspects especially in the field of entrepreneurship and innovation to offer unique and super quality products and services to different markets.

Introduction

The two concepts of entrepreneurship and innovation are considered interrelated and interdependent. There is no doubt that creative innovation has a great impact on entrepreneurship when it comes to designing and executing any business. The compatibility between entrepreneurship and innovation constitutes one of the essential foundations of modern strategic thinking, because utilizing these two concepts as a guide to strategic planning of different activities, among which are the marketing activities, leads to designing an effective strategy able to compete and excel all other competitor. Marketing thinking is ever changing and dynamic; it depends on innovation and creativity in developing marketing activities, especially in a business environment characterized by severe change and competition, in order to determine an entrepreneurial marketing strategy that sits at the top of the competitive and market leadership ladder. Both marketing and innovation are among the vital and important tasks of management, each concept completes the other. Since both entrepreneurship and innovation are compatible, therefore marketing and entrepreneurship are compatible. The compatibility among marketing, entrepreneurship and innovation, if it is clear to the

responsible management, should help develop entrepreneurial and innovative strategies from the perspective of designing and execution.

The Problem of the Study

This study attempts to answer the following questions:

- Is there a relationship between entrepreneurship and innovation on the one hand, and strategic planning, on the other, so that the development of an entrepreneurial successful and effective strategy is possible?
- Does designing and developing a marketing strategy that utilizes both concepts of entrepreneurship and innovation enable the organization to reach the top ladder of competition and market leadership?

The Importance of Study

The importance of this study lies in the attempt to find a relationship between each of the concepts of marketing, innovation and entrepreneurship. And the impact of this relationship in developing an entrepreneurial marketing strategy, as such concepts are compatible, because the innovation of new products and services that are unique and high in quality forms the foundation to entrepreneurship in this field. Successful marketing strategic planning must rest an solid foundation of innovation and entrepreneurship, a foundation which is considered an essential intellectual method of such planning.

This study lays the foundation of a new method in strategic marketing thinking in the light of the fact that the three concepts mentioned above have not been tackled by many researchers and that such a relationship among the above mentioned concepts has been rarely established, therefore, this study is a new and rare attempt in this subject.

Objectives of the Study

According to the importance of this study, its objectives are summarized as follows:

- Finding a relationship between entrepreneurship and innovation and pointing out the importance of such relationship to marketing activities.
- Clarifying the connection between marketing, innovation and entrepreneurship in the light of that such concepts are compatible.
- Clarifying and finding the relationship between entrepreneurship, innovation and strategic planning in determining and applying marketing strategies in business organizations.

The Study Methodology

The researcher used deductive analysis as a basic method for this study. Studies and literature review related to the subject have been reviewed so that different aspects of the study be established, such aspects include:

- Theoretical and analytical aspects related to entrepreneurship and innovation and the attempts to establish a link between such concepts as well as to show their impact on business organizations at the present.
- The attempts to find a relationship between the concepts of entrepreneurship and innovation and the process of designing and developing marketing strategies which are effective, successful and entrepreneurial.

First: Entrepreneurship

Entrepreneurship has long been considered an important economic activity. The past 20 years has witnessed an explosion of research into entrepreneurs and their actions. The proliferation of World Wide Web that opened up oceans of information has spawned thousands of entrepreneurial ventures. It is not surprising that entrepreneurs are as varied as the kinds of businesses they start. There are four broad categories of entrepreneurs:

1- The home-based entrepreneur.

2- The serial entrepreneur.

3- The traditional entrepreneur.

4- The cyber entrepreneur. They transact all their businesses with customers, suppliers, strategic partners and others on the Internet and deal in digital products and services that do not require bricks-and-mortar infrastructure like warehousing and physical distribution. (1)

(a)- Definition of Entrepreneurship

There are about as many definitions of entrepreneurship as there are people who have written about the subject. Some define entrepreneurship as a concept that describes strategic thinking and the behavior of risk tolerance which results from creating new opportunities for individuals or for the organization. Others define entrepreneurship as characteristics and behavior that start a business, plan and organize it. Tolerate its risks and show creativity in managing it.A person who has such traits is called (an entrepreneur). He is an individual who has the capacities of risk tolerance, transformation of opportunities, creative planning and management of his own. Peter Drucker defines an entrepreneur as "a person who examines changes, responds to changes, and transforms changes into opportunities". In general the definition of entrepreneurship consists of the interaction of the elements shown in the following figure. (1).

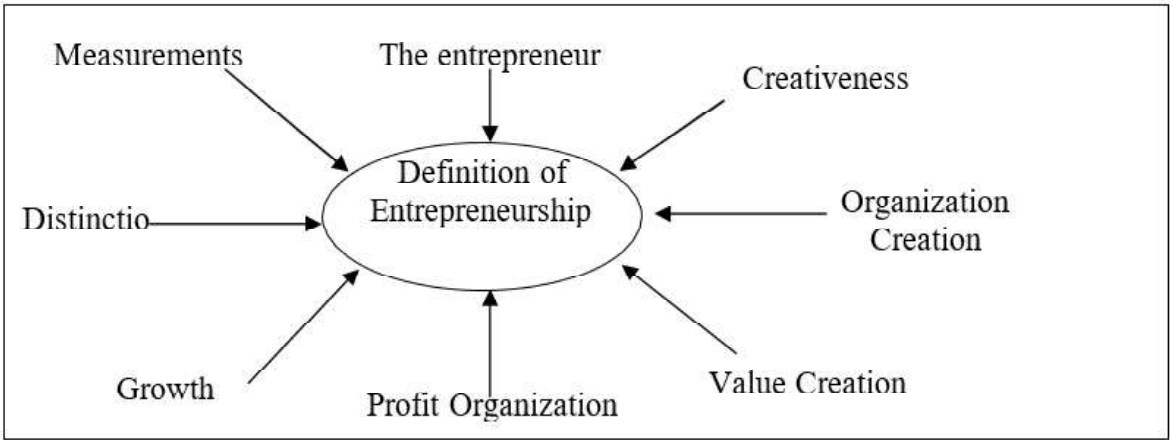

Figure (1)

Elements of entrepreneurship definition

Unlike the past, the global economic warfare are urgently requires us to envision new business environments, strategies, tactics and types of manpower. Some call this economic warfare "the war to create talents". The individuals eager to join business organizations should equip themselves with what the company expects from them in advance. They should harmonize their properties with what the company wants from them as its employees. Such requirements mean core competencies which has become vital in the knowledge

based economy environment, among which are digital literacy, global , competency, creativity and openness to learning as well as to have strong work Ethics. Such basic competencies originate in entrepreneurship based on adventurous spirit, defiance and enthusiasm. Entrepreneurship is the base of self-innovation, a trait that should characterize all social members and enterprises, as society can only evolve by pursuing innovation based on entrepreneurship.

(b) Entrepreneurship as Related to Business Organizations and their Employees

1- Success and failure depends on "positive view point".

2- The two core factors required for this change era are the "critical mind" and the "spirit of challenge". We should boldly get out of our "Comfort Zone" and get into the "Risky Zone". We should keep in mind the lesson "those who set up a castle and settle within it, will go to ruins by all means, while those who keep on going will survive. Survival is the ally of those who respond to the quick change in the global environment.

3- The creativeness required for this era originates from diversification and professionalism. As extraordinary and outrageous ideas can change the world, original and diverse viewpoints are required. Sometimes efforts to solve problems which do not have answers should be made. It is often said that the global sum of knowledge and information doubles every 73 days. We should be

aware that continuous hearing activities should be carried on throughout our lifetimes in order to attain professionalism in this knowledge-based era.

4- You should start to create changes and challenges now. One research said that the average durability of the world's businesses has reduced to 12.5 from 30 years, which is then as if a man dies in his teens.

5- It is supported by the fact that a third of the 500 companies that "Fortune" named the world's top in the 1970s died out within 13 years. In this sense, it would be safe to say that an enterprise is a living organic body that should continuously change. In order to make these changes. Individuals first should become accustomed to changes.

6- Continuously emerging enthusiasm is necessary. Therefore, entrepreneurship, in this knowledge-information era can be attained through a more practical and empirical approach than in the past. We should look at the world with a positive viewpoint. Be fully prepared for adventure, and accept challenges based on diversity and creativeness.

(c) Entrepreneurship Elements:

There is an interaction among four basic elements of entrepreneurship:

1- The entrepreneur is the center of entrepreneurship actions.

2- The opportunity which is the gap between what is real and what is expected in the market.

3- The origination is the framework which incorporates the harmony between activities, sources and individuals.

4- The materials which includes supplies and present capabilities which can be invested by the entrepreneur in his enterprise (3).

(d) Entrepreneurs' Characteristics:

Diversity seems to be a central characteristic of entrepreneurs. An entrepreneur appears to exhibit the following characteristics:

1- Vision- They visualizes a future not seen or thought possible by others in their industry. (4) They have the ability to enact that vision or actually create the future that they envisioned.

2- Innovation – Entrepreneurs are people which create new markets, new products, and / or new services. They change: revolutionize, transform and introduce new approaches or systems. They employ resources with a new capacity to create wealth.

3- Passion for the business – This passion explains why wealthy people continue working after they are financially secure.

4- Product/customer focus – The fact that they keenly focus on products and customers means that most successful entrepreneurs are, at heart, craftspeople.

5- Opportunity identification – They seize opportunities, they see opportunities where others tend to see risk.

6- Creating value- This means the ability to fashion a solid business idea into a viable business, it also means developing a business model, putting together a new venture team , raising money, establishing partnerships managing finances, leading and motivating employees, translating, thought, creativity and imagination into action.

(e) Entrepreneurship Motivations:

The three primary reasons that motivate people to become entrepreneurs and start their own firms are:

1- To be their own boss – because they have had a long-time ambition to own their own firm or they have become frustrated working in traditional jobs.

2- Pursue their own ideas – some people are naturally alert, and when they recognize ideas for new products or services, they have a desire to see those ideas realized.

3- Realize financial rewards – this motivation is secondary to the first two and often fails to live up to its hype. (5)

Second: Entrepreneurial Organizations:

1- Entrepreneurship is the process of exploiting opportunities that exist in the business environment or those opportunities realized through innovation in an attempt to create value. (6).

2- Entrepreneurs and entrepreneurial organizations always operate at the edge of their competence, they measure themselves not by the standards of the past but by the visions of the future and they do not allow the past to serve as a restraint on the future, the mere fact that something has not worked in the past does not mean that it cannot be made to work in the future. And the mere fact that something has worked in the past does not mean that it should remain. (7)

3- Risk tolerance and that is the ability related to strategic thinking and planning for everything new. (8)

4- The organization culture through rewarding entrepreneurial performance, the introduction of state – of – the – art technology, searching for and identifying innovative ideas and executing them within a limited time framework as well as spreading positive value among individuals.

5- Units and subunits within the organization should have freedom and independence of action, as well as having access to information.

6- The organization should have an ideal style for innovation that is open and supportive to nurture new and quality product and service development in order to have an advantage over competitors.

7- An entrepreneurial organization has a simple and flexible framework.

8- An entrepreneurial organization is supportive to innovative leadership talents, consequently, developing and improving performance.

9- Generally speaking, flexible, adaptive and open organizations are more conducive to innovation and entrepreneurship. It should be innovatively and

proactively responsive to environmental changes by introducing a new product, process, service or implementing a distinctive business model. (9)

10- Entrepreneurial organization in a knowledge – based society builds bridges between individuals and information systems in order to achieve the utmost benefits. (10)

As for entrepreneurial skills, they are summarized as follows:

1- Entrepreneurs continuously seek to develop new sources for materials, characterized by a competitive advantage from the perspective of quality, cost and transport.

2- They search for and develop new markets within the framework of the modern marketing concept. Business entrepreneurs are creative; they identify opportunities and create customers, thus different from traditional businessmen.

3- Entrepreneurs are the organizers and the determiners of most production elements.

Third: Consideration for Establishing an Entrepreneurial Business:

1- The role of information- which is now readily available to practically anyone from anywhere in the globe at any hour of the day and in almost any format. The almost instant availability changed the nature of the economy. This in turn affects the context of entrepreneurship.

2- Technological needs where all organizations regardless of size type, or location, use some form of technology to do their work. Four key technological trends that are affecting the context of entrepreneurship are the increasing rate of technological change and diffusion, the increasing commercialization of innovations, increasing knowledge intensity, and increasing recognition that advanced information technologies are the cornerstone of successful businesses.

3- Globalization is where the linkage of economies and culture that fosters a business and competitive situation in which organizations has no national bounderies.

4- Changing demographics identifies a series of vital statistics of population. The world's population is getting older and younger at the same time. (11)

5- It is widely recognized that innovations in the areas of knowledge transfer and communications represent significant opportunities for competitive advantages.

6- It should be well recognized that the small and medium-sized enterprises are the seedbed of inventiveness, creativity and innovations, and that there should be symbiotic relationship between marketing and entrepreneurship. (12) Peter Drucher's view that "management have only two key tasks: marketing and innovation", reinforces the adopted view that the two are intimately interlinked. (13) and that innovation is the key for competitiveness and market leadership.

7- Growth which includes tangible growth indicators such as revenue growth, increase in market share and growth profits. But there are also intangible outcomes in growing a business and pursuing opportunities.

8- Economic and social change both positive and negative. Positive benefits may include advancement in technology, increased levels of employment and productivity, and enhanced quality of life as well as improved efficiency.

9- Financial risk- the success of entrepreneurs is closely tied to the way they perceive and manage risk.

10- Tenacity despite failure – establishing an entrepreneurial business requires a certain degree of experimentation. Failures inevitably occur during this process. The test for entrepreneurs is their ability to perceive through setbacks and failures.

Fourth: Factors Propelling Innovation and Entrepreneurship in Relation to New Products:

1- Clear vision communicated throughout the company.

2- Development of a culture of innovation – through rewarding people and taking calculated risks.

3- An organic organizational structure – rather than having a central group of IT managers, producers and product managers, each product unit employs their own staff and their own responsibilities.

4- Job clarity.

5- Accountability and responsibility.

6- Clear key performance indicators.

7- Strong financial position and reasonable profit expectations.

Entrepreneurship is considered the fourth key element of production and that innovation and creativeness determine a new economic mix of elements (14). One important study classifies entrepreneurs into five types:

- Supporters.
- The smart.
- Diligent.
- Seekers of Perfection.
- Idealists. (Figure 2)

On the other hand Yorklovich (15) divides entrepreneurship into:

- Innovators.
- Systematic innovators.
- Optimistic Promoters.
- Founders of Firms.

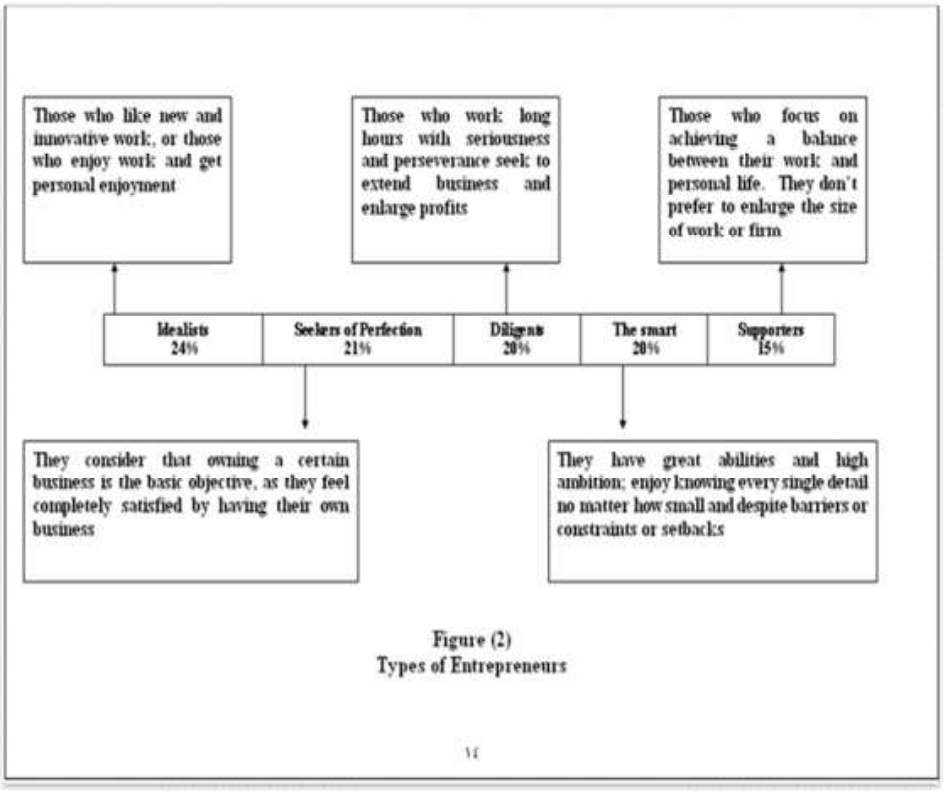

Figure (2)
Types of Entrepreneurs

Fifth: Knowledge Innovation:

The Future as an Asset:

Entrepreneurship has gained interest partly because it is the source of innovation. Industries, are like nations, they have a life cycle curve which shows points of transformation. According to Debra Amidon. (16) Amidon shows a number of stages of knowledge innovation. Figure (3)

According to the figure above, there is a noticeable change from tangible to intangible assets by the firms. Tangibles would include physical assets such as land and buildings, plant machinery and equipment. Intangibles would include software, brands, trademarks, and licenses, rights over scientific discoveries, knowledge recepies and relationships. The gradual development from tangibles to intangibles. As shown in the figures goes as follows – product as an asset, project as and asset, company as an asset, customer as an asset, knowledge as an asset and future as and asset, which means, the potential value that results from investment in innovation. Indeed the transition from the industrial to the information society is characterized by the rapid growth of intangible assets. This is the space for knowledge innovation and entrepreneurship. Intellectual capital should be the solid foundation for any business organization for future growth and development. The focus on intellectual wealth and knowledge by nations is in itself a major change being witnessed by the business world.

Sixth: Marketing Entrepreneurial Strategies:

1- An Entrepreneurial and innovative organization needs internally focused strategies that propel growth and stimulate change within such organizations.

2- Entrepreneurial organizations need externally focused strategies that actively seek out new ventures, acquisitions, mergers, or joint ventures to achieve marketing and commercial success through innovations.

3- Such strategies should be diverse enough to address a spectrum of technological, financial and

human issues and should be congruent with the future scenario envisaged for the organization.

4- Given the close synergies between entrepreneurship and innovation, the strategy should be both entrepreneurial and innovative and should include methods of transforming established products and services into something new that will add value to existing businesses.

5- The strategy should meet and exceed the changing needs of customers, as well as an emphasis on marketing and developing new markets.

6- In the current turbulent marketing environment, developing organizational capacity to acquire, create, accumulate, and exploit knowledge should be an essential strategy in gaining a competitive advantage through innovation.

7- A good strategy depends on effective execution and requires an appropriate system, a capable staff team, a wide range of skills, and an encouraging and supportive management style that fosters an innovative and entrepreneurial organizational culture.

8- The combination between entrepreneurship and innovation is a crucial factor to the long-term sustainability of such strategies , because Entrepreneurship and innovation are positively related to each other and interact to help an organization to flourish, both are complementary and a combination of the two is vital to the organizational success and sustainability in today's dynamic

environment. Entrepreneurship and innovation are dynamic and holistic processes in entrepreneurial and innovative organizations.

What Factors contribute to Successful Entrepreneurs?

1- Flexibility in strategic planning – In this technologically – dominated business world, the organization needs to have a flexible structure to be able to respond to the ever – dynamic and ever- changing environment.

2- Provision of high levels of service – A company's reputation plays a major part in obtaining repeat business from existing clients and attracting new clients.

3- Developing basic management skills – A Successful entrepreneur must acquire basic management skills and attributes such as leadership negotiation and business planning. Furthermore, a balance needs to be a maintained between the technical demands and the business demands of the company, especially those relating to people management – customers. Suppliers and employees. Motivating employees will remain a key task for managers regardless of the type of the organization.

4- The establishment of a new venture requires a great and long commitment as far as hard work and financial capital are concerned. A successful business requires patience to achieve satisfactory results.

Entrepreneurship and Marketing:

1- The rapid change in products in response to customers' changing needs and preferences and the wide variety of such products calls for continuous development of products and creating new ones in order to meet and satisfy consumer needs. Entrepreneurial organizations gain superiority over competitors by offering customers high quality products and services.

2- Entrepreneurs should carefully examine the market through dividing it into segments (sectors) in accordance with specific criteria. The pricing process is complicated and needs creativeness and innovation. Project entrepreneurs should maintain a balance between budgeting and flexibility – between costs and

production. On the one hand, and marketing competitive trends as well as customers expectations. They should re-examine internal and external factors related to price changes and their effect on the new situation.

3- The search for unusual, new and creative promotion methods in order to attract customers. Here the application of the Internet and other related network technologies promise significant returns for the customers who look for how, when. And where to find products and services on the Web, and for the organizations that get the feedback from such customers.

4- The importance or speed delivery of products and services to customers is a must, whereby organizations gain competitive advantage. The concept of value creation lies at the heart of competitive advantage. A high emphasis needs to be placed on providing regular and outstanding service to clients.

Steps of the Innovation Process:

According to Roffe, (17) different skills are needed for the different steps of the innovation process, namely:

- Idea generators.
- Information gatekeepers in touch with.
- Knowledge Sources.
- Product champions who develop new methods and processes.
- Business managers who keep business on the right track.
- Leaders who encourage and foster innovation and entrepreneurship.

Recommendations

1- The creation of knowledge awareness through focusing on its concepts. It is essential to allow for a knowledge culture because converting new ideas and inventions into viable innovations is the foundation of the modern knowledge society. This should be achieved by focusing on education, training and embracing talents and creativity, as well as through lectures, seminars, conferences, supporting groups, and workshops.

2- Establishing the basis for knowledge on solid foundations and supporting all means that facilitate converting ideas into innovations. Encouraging talents, and applying the principle of finding continuous access to global innovation centers as well as building good relationships with global partners.

3- The generation and knowledge creation are realized through research and development, openness to learning, and sharing, managing and exploiting of advanced information technologies with the accumulated global knowledge, in order to prepare for a future based on education, knowledge and entrepreneurship.

4- Exploiting the acquired knowledge to achieve continuous development. Perhaps one of the key indicators of using knowledge is the information revolution and knowledge economy.

5- The diffusion of knowledge – such process is an indivisible part of knowledge awareness.

6- Integrating and coordinating knowledge activities among organizations, as the focus on human wealth and providing knowledge should certainly quicken the pace for achieving knowledge economy which, in turn, leads to achieving social and national economic development

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15

A comprehensive Review of Innovative Human Resource Management

Dr. Pritidhara Hota

Abstract: This study briefly reviews the research on novel approaches to HRM. Analysis of 47 articles yields three primary schools of thought when it comes to creative HRM. At its most basic, HRM innovation is just that. How human resource management handles novelty is the subject of other research. Thirdly, the term "innovative HRM" can be found in studies of inventiveness in business. Each of these three methods is discussed, along with their theoretical underpinnings. Implications for future study and practice are discussed at the end of the note.

Introduction

Human Resource Development (HRD) is more important than ever for businesses in today's world, where organisations must adapt to a constantly shifting global marketplace. Employees who possess the necessary expertise, experience, and aptitude are necessary to meet the demands of such external factors. To help with this, companies may need to implement fresh HRM strategies. The goal of progressive human resources policies and practices is to equip workers with increased independence and improved proficiency so that they can adapt to and thrive in ever-evolving work environments (Eltweri, Faccia, & Khassawneh, 2021). Researchers and HR managers, then, need a firm grasp on what we mean by "HRM innovation" and how it can be realized. This research note, which is part of an ongoing project looking into what is known about innovative HRM and how organizations achieve it, reviews prior research that may be helpful in this regard. The following outline constitutes the body of this study. The methodology is first laid out. The second section details the most crucial findings. And finally, we talk about the theoretical ramifications. At the end of the note, the authors offer some recommendations for future study and application.

Method

A multi-stage process was used to review the literature on novel approaches to HRM. The first task of the literature review was to track down relevant articles. Scholar.google.com was used as the primary source for an article search. The terms "innovative hrm," "innovative hr practices," "innovative human resources practices," and so on were used to locate articles exploring novel approaches to HRM. Since we are curious as to how actual HRM innovations are implemented in companies, we opted to look at empirical research in this area. We hope to learn more about the types of innovations adopted by businesses by combining qualitative and quantitative research methods. As a result, the articles chosen focus on empirical research into novel approaches to HRM rather than purely theoretical works. Moreover, we did not provide an up-front definition of the term innovative HRM because a large part of our study involves determining what researchers actually mean when they use the term. Possible interesting articles were added after checking the references of the articles that this initial search generated. A slightly broader conception of innovative HRM was used to evaluate these articles for relevance to this literature review. In order to make sure no pertinent articles were overlooked, we also searched for terms like "human resource management," "hr practices," and so on in articles about organizational innovation. A review of the papers

was conducted to evaluate the data they contain about creative HRM. Articles of adequate scientific quality were included in the review because they were chosen from publications included in the Social Sciences Citation Index (SSCI). As a result, fewer articles appeared in the final results. Even though the term "innovative HRM" was used, a number of papers were disqualified because they did not examine the concept. The term is used very generally in these pieces, without any attempt to define its precise nature. Articles like these often make broad claims without providing context or definitions, such as the claim that "innovative HRM practices" are necessary for businesses. These articles are not relevant to the discussion in this article. There were 47 articles left that met the criteria for inclusion and analysis in the literature review (Appendix A provide the list of the articles). Articles were reviewed to identify broad strategies for HRM innovation.

Modern HRM

The results of the analysis and a brief synopsis of the 47 articles reviewed can be found in this study. The research has three sections: methods, findings, and themes. Regarding the strategy of innovative HRM, the literature identifies three distinct lines of inquiry: (1) research into the innovation of HRM; (2) research into HRM as a reaction to (technological) innovations; and (3) research into the relationship between HRM and organizational innovation. The "studies" column lists the total number of relevant studies for each methodology. In addition, several subthemes are specified in the third column, indicating that there are some distinctions among the three identified lines of inquiry. We'll go over the various methods and underlying themes below.

Evolution in Human Resource Management

The term "innovative HRM" is typically used to refer to forward-thinking approaches to human resources management. However, there is a nuanced distinction within this method that must be accounted for. The term "innovative HRM" is used in some academic circles to describe strategies and procedures that are truly ground-breaking (in the sense of being radical innovations as they are referred to in the innovation literature, see for example Crossan and Apaydin 2010). Another definition of "innovative HRM" in the literature describes it as "a label for change or innovation of existing policies and practices" (e,g, Khassawneh, 2018).

Many research projects are driven by a desire to identify and analyze game-changing developments in HRM. Research in this area typically begins by defining what is meant by "innovative HR policies and practices," before moving on to examine how widespread adoption of these policies and practices is within various organizations. Some of the hallmarks of successful new approaches to human resources are: Fairness in treatment Investment in people Possibility of long-term employment

The use of incentives (beyond financial incentives)

- **Independence and decentralization**

Agarwala's (2003) research provides a useful illustration of this method at work. Research breaks down human resource practices into 14 distinct categories, including hiring, rewards, and training. Such research is associated with "High Performance Work Systems" (or related concepts such as HPW- organizations, HPW-practices, HIPOs, and so on) (Appelbaum, Bailey, Berg and Kalleberg 2000, Combs, Liu, Hall and Ketchen 2006). This body of literature is primarily theoretical, with the central idea being that effective human resources (HR) policies and practices can boost organizational performance by improving employee

performance, satisfaction, and commitment when these factors are combined into coherent systems. Human resources (HR) policies and practices, such as those used to recruit new workers, train existing ones, pave the way for advancement, etc., must be presented as an integrated whole if they are to be competitive. This implies that using a single tool to achieve a goal is inefficient, and that using multiple tools to achieve the same goal is preferable. In this view, businesses that use tools with competing aims (like rewarding teamwork with individual bonuses) perform worse.

Furthermore, the literature demonstrates that internal alignment (fitting together) and external alignment (fitting the organization's environment) are necessary for the success of such policies and practices (Huselid 1995, MacDuffie and Kochan 1995). The fact that workers are more ready, willing, and able to complete their assignments when HR tools are coordinated is a major factor in explaining the improvement in productivity (Koster 2011). Having a unified set of HR policies and procedures sends a clear message to employees about the company's values and direction, which in turn increases their motivation to do their best. Therefore, these establishments cultivate and maximize their human capital. Organizations that have adopted cutting-edge HR policies and practices value collaboration and promote a culture of open communication among employees and departments. It's important to recognize that cutting-edge human resource management is a key component of today's high-performance workplaces. Organizational management encompasses not just people management but also the quality of support staff and the overall structure and strategy of businesses. It's easy to see how creative HRM fits into the bigger picture.

As was previously mentioned, there is a common approach in the literature on innovative HRM that we have labeled the radical innovation subtheme (in the sense that organizations have these HR policies and practices or not). Studies in this collection examine the rituals' substance. This perspective on innovative human resource management (HRM) is, in some ways, static; that is, companies use a set of practices that can be broadly categorized as innovative. The second grouping of related studies emphasizes reform, revival, and enhancement of preexisting organizational practices. Consequently, incremental innovation has been given a lot of attention. That's why it has some parallels with traditional HRM concepts. Researchers here take the approach of first defining HRM functions (selection, hiring, training, etc.) before asking the question of whether or not businesses have implemented changes in these areas. It is up to the respondent to determine what constitutes a change; however, the standard procedure is to inquire about ways in which existing tools could be (considerably) enhanced. If these companies have

made adjustments and enhancements to their HR management, policies, and practices, then they are considered innovative (Khassawneh & Mohammad, 2022a).

Human resource management (HRM) is influenced by innovations.

Though innovation is central to human resource management in the first school of thought, the second and third schools of thought separate the two. The second method does this by making innovation the controlling variable in their studies. Thus, the underlying premise of this body of literature is that businesses modify their HR policies and procedures in accordance with the external environment.

Changes in the organization's environment, such as the introduction of new technologies, are themselves innovations. Here, too, we find two distinct motifs. The proximity of technological advancement to human resource management is the dividing line between the subthemes here. There is a weaker connection between HRM and external innovations in the first theme. Contrarily, this connection is robust in the

second theme because it is focused on how novel ideas influence HRM procedures within businesses.
The first subtheme of this innovative HRM strategy is research into the effects of external trends on HR policies and practices. Included are studies that take a macro perspective on these developments and consider the implications for the future of human resource management. Colakoglu, Lepak, and Hong's (2006) research is illustrative of this subtheme because it examines the effects of technological development and internationalization on the structure and nature of the workplace. Ulrich and Dulebohn provide a more comprehensive analysis (2015). They contend that HRM's trajectory is tied to a number of macro-level phenomena, including: • social trends, such as healthcare, lifestyle, and family structures; • technological trends, such as digitalization; • economic trends, such as inflation, recession, and the state of the labor market; • political trends, such as stability and elections; • environmental trends, such as sustainability; • demographic shifts, such as age, education, diversity, and income.
Each of these movements can be seen as a possible source of new ideas in HRM's broad context. However, innovations in technology (along with shifts in the environment) best illustrate the connection between HRM and creative problem solving. Recent debates about the effect of robots on the labor market are a natural extension of this study. However, as opinions about this impact vary, the repercussions for HRM are currently unknown. Authors Autor, Levy, and Murnane (2003) and Frey and Osborne (2013), who are frequently cited in the public debate, argue that jobs will be eliminated, while others anticipate the creation of new jobs as a result of the introduction of robots (Brynjolfsson and McAfee 2014). Some job losses may coincide with the creation of new ones, and vice versa. In turn, this will have effects on human resource management in areas like employee turnover, internal competitiveness, education and development, recruitment, and employment. The net effect of technological advancements will determine the direction in which this is heading. The same is true for the standard of the work that has been preserved. To what extent this causes job up- or down-skilling is unclear at this time (Khassawneh & Mohammad, 2022b).

Consequences for human resource management can be expected in either scenario.

The second thread relates HRM specifically to the idea of innovation. Studies that conform to this conception of innovative HRM focus on issues related to how businesses arrange their HR department in light of emerging technologies. One trend deduced from these pages is the increasing use of E-HRM and other forms of technological HRM by businesses. The term "e-HRM" (Rul, Bondarouk, and Looise, 2004) describes the practice of utilizing the Internet and other forms of IT to facilitate the management of an organization's human resources. Although electronic human resource management (E-HRM) is not a new concept, relatively few academic studies have focused on it as opposed to the fields listed. The literature review is provided by Marler and Fisher (2013). They demonstrate the immaturity of the study of E-HRM. Nonetheless, they amassed a sizable body of research. Their primary criticism is that most of these studies assume a predetermined relationship between humans and technology. This stands in stark contrast to the more nuanced and evolutionary perspective on technology's effects that has been adopted by the field of technology studies, as noted by Marler and Fisher (2013). This area will likely catch up to these broader conceptions of technology's function in organizations as digitalization processes and the opportunities it presents for information sharing and other applications continue to develop. Human resource management (HRM) and technological advancement are also intertwined in the study of outsourcing. The evolution of IT has made possible the outsourcing of HRM, which means that some businesses now contract with

outside firms to handle tasks like payroll and employee development (Greer, Youngblood and Gray 1999, Gainy and Klaas 2003). Companies can gain access to tools for human resource management (HRM) that are not currently in use internally by outsourcing (part of) this function (Khassawneh & Abaker, 2022). These technological advancements are undoubtedly the wave of the future and will always be a part of HRM. It's possible this is the way HRM will develop in the future. But it's impossible to say up front whether this counts as a major or minor breakthrough. Human resources (HR) policies and practices may, on the one hand, remain the same despite any shifts in organizational structure or providers. Then it would be an example of gradual progress. However, the extent to which E-HRM is used and the number of functions to which it provides access grow significantly if, for instance, they are connected to digital platforms that also function as an external labor market.

Innovations made possible by human resource management

The third strategy for creative HRM flips the traditional order of innovation and human resource management. In this subfield of the literature, specific human resources policies and practices are seen as conducive to, if not necessary for, an organization's innovativeness. The term "organizational innovation" encompasses a wide range of enhancements that businesses can make, such as the launch of new products and services, the adoption of novel marketing strategies, and the introduction of novel approaches to production and management (e.g. Crossan and Apaydin 2010, Pouwels and Koster 2017). These policies and practices are the independent variable in this cutting-edge HRM research strategy.

Human resource practices and policies from both the past and present that have been identified in the literature on high performance workplaces are examined (Khassawneh, Mohammad, & Ben-Abdallah, 2022)

Similarly, this strategy contains two underlying themes. Human resource (HR) studies that fit the first subtheme are those in which the researchers have a clear understanding of what HR policies and practices are thought to be effective in fostering organizational innovation. For instance, Pouwels and Koster (2017) found that businesses in 32 European countries that used training and performance-related pay had higher scores on product and service, market, and process innovation.

The second group of studies is more exploratory in nature. Researches that take a data-driven approach to HRM label as "innovative" those HR policies and practices that are shown to increase an organization's propensity for innovation. It follows that the first subtheme draws a distinct line between HR policies and practices on the one hand and organizational innovation on the other. This is less of an issue in the second theme, where results (innovations) are used to define HR strategies and procedures. One example of such an approach can be found in the work of Oladapo and Onyeaso (2013). They look into how innovative practices in the workplace contribute to high productivity. Then, we can say that the HR practices that address the first two of these three dimensions are examples of cutting-edge innovation in the workplace (Mohammad & Khassawneh, 2022).

In contrast to the other two perspectives, in which HRM is seen as a reaction to (external) developments, the central questions in both of these subthemes are to what extent and how HRM contributes to the innovativeness of organizations. These studies support HRM's value by demonstrating its efficacy in this specific area.

Explanations and hypotheses

Reviewing the existing literature, I found that there are at least three distinct ways that innovative HRM is conceived of. That's why trying to explain HRM innovation requires a variety of theoretical lenses. Methods 1 and 2 (HRM innovation and HRM's impact on innovation) can be explained using analogous theoretical frameworks, but Method 3 (HRM's role in fostering innovation) necessitates the application of additional theoretical insights. Several of the most influential theories are broken down into the following two categories below: Defining what innovative HRM is and why it's being implemented; and Delineating HRM's role in fostering an environment conducive to creative problem solving (Mohammad et al., 2021).

1. Why do organizations use cutting-edge HRM practices?

There are four overarching theories in HRM that help to explain why certain HR policies and practices are implemented. This includes, but is not limited to, economic, alignment, decision-making, and diffusion explanations (Subramony 2006, Koster and Wittek 2016). Each of these possibilities is supported by the research that was analyzed. Plus, some studies offer contrasting theoretical perspectives or multiple explanations.

Factors in the Economy

According to the monetary view, business owners consider the costs and benefits of potential HR policies and practices before deciding to implement them. That is, they are thought to put money into their people if they anticipate a return (in terms of performance or other desired organizational goals, such as employee satisfaction and loyalty). The study by Sels, De Winne, Delmotte, Maes, Faems, and Forrier provides one economic explanation (2006). They demonstrate a link between HRM expenditures and improved retention and output.

Explanations of Alignment

Fit between the components that make up an organization is highlighted in explanations of alignment. What this means is that the company's internal components—its strategy, its technology, its size, and so on—must all be in sync with one another and with the external environment in which it operates. These points apply equally to human resource management (HRM), in accordance with alignment theories: HRM's various policies and practices must be consistent, cohesive, and aligned to the rest of the organization and its external environment. This line of thinking is illustrated by a study such as that conducted by Tafti, Mithas, and Krishnan (2007). They reveal that businesses try to blend HR procedures that complement one another, while also looking for ways to align these procedures with the company's overarching IT strategy.

Justifications for choosing

Explanations of decision-making account for the fact that choices within organizations are the results of the actions of various actors with their own interests in mind. Similarly, HRM-related choices fall under this category. The focus of these explanations is on power rather than efficiency or effectiveness. Human resource policies and practices are implemented in organizations as a result of power struggles between various groups. The decision-making explanation challenges the presumption underlying the economic and alignment explanations, respectively, that outcomes are rational and that the best objective outcome will be achieved. This is demonstrated by the studies conducted by Foster and Harris (2005). They look into the methods by which businesses create their diversity policies. They claim that businesses can reap benefits from instituting policies to encourage greater diversity in the workplace. Nevertheless, many institutions

still fail to implement such measures. To what extent managers contribute to this process is demonstrated by Foster and Harris (2005). The adoption and implementation of diversity policies are influenced by how organizations deal with the inherent tensions that arise as a result of their existence.

Explanations of diffusion

Last but not least, diffusion explanations center on legalization steps. This paper argues that organizations can improve their reputations in the eyes of the public by adopting certain human resources policies and practices (such as financers, customers, governments and competitors). Here, we ask at a macro level how policies and practices within a country, region, or sector spread to other places.

Research such as that conducted by Murphy and Southey (2003) and Wu, Bacon en Hoque (2014) demonstrates how questions of legitimization contribute to an understanding of these dissemination processes. Both investigations found that external factors played a significant role in the spread of novel HR practices. Human resource professionals who make decisions about (innovative) HRM adoption are aware of and consider these external factors. As the presence of external networks (such as business advisory networks) demonstrates, HR practitioners may indeed seek legitimacy in these networks by adopting certain practices, this is one of the main reasons for adopting these HR policies and procedures.

2. Defining the role that HRM plays in fostering creativity

Human resource management (HRM) and organizational creativity can be seen as interrelated in some ways, and the aforementioned theories can help to explain why. It could be argued, for instance, that economic theories are relevant because businesses use particular procedures to deliver novel goods and services and to employ novel advertising approaches. One such example is the research conducted by Cheng and Huand (2009). Strategic human resource management is advocated as a means by which businesses can better manage their own institutional knowledge. This has beneficial effects on the organizations' ability to implement novel innovations. The other three theories can be applied in the same vein.

Aside from that, there are theoretical takeaways from the wide-ranging literature on innovation that can be applied to the specific case at hand. Both the Resource Based View (RBV; Barney 1991) and the Resource Dependency Theory (RDT; Pfeffer and Salancik 1970) establish a connection between the availability of special resources within an organization and its capacity for creativity. These hypotheses explain, in general terms, how and why these resources help businesses innovate. The RBV accomplishes this by positing that businesses with an advantage in the marketplace are those that successfully exploit scarce resources. Their ability to think outside the box is a big help. According to RDT's expanded view, an organization's ability to innovate is influenced by the number and quality of the connections it forges with other actors in its environment in order to gain access to those resources. Human resource management (HRM) can make use of these overarching frameworks because people are resources that organizations have at their disposal. Human resource management (HRM) has the potential to boost an organization's creative capacity by helping its employees improve their competence and providing them with means to maximize their work effort (via training, improved employability, and so on).

Conclusion

This study note reviews the existing research on novel approaches to HRM. The primary takeaway from this literature review is that the term "innovative HRM" can mean one of three different things: either an innovation in HRM itself, an HRM response to innovation, or a discussion of HRM's role in fostering an

innovative culture within an organization. This realization has important implications for both study and practice.

Relevance to future studies

Researchers in the field can improve their standing if they have a firmer grasp of the idea of innovative HRM. A more focused research question can be helpful for those interested in studying HRM innovation. Therefore, the three approaches discussed in this summary have not interacted much up to this point.

There is potential value in combining these viewpoints in order to better understand technological innovation, HRM innovation, and organizational innovation. Common in innovation studies, the distinction between radical and incremental innovation was briefly discussed. Furthermore, it is possible to conceptualize organizations that are radical innovators in the field of HRM by combining several of the aforementioned subthemes. Such a framework might, for instance, envision businesses adapting their HR policies and procedures in response to changes in their external environment, all in an effort to become highly innovative as an entity. There is currently nothing in the literature that represents such a comprehensive melding of the three research methods discussed in this article. Studies either focus on the link between technological innovation and innovative HRM, as reflected in the theories discussed under the heading "Explaining the adoption of innovative HRM," or they link HRM with organizational innovativeness, following arguments presented under the heading "Explaining how HRM contributes to innovation," so there is little information about this. An improved comprehension of the interplay between technological, human resource management, and organizational innovation can be attained through the development of theories that incorporate these approaches and perspectives. What impact do organizations with this level of innovation have on HR growth? is one of the research questions that arises from this line of thinking. As such, the present review may encourage further study in that field.

The connections between HRD and cutting-edge HRM are also highlighted in this analysis. Many human resources (HR) policies and practices described in the various literature sources focus on improvement. Articles on cutting-edge HRM frequently discuss HR tools like training and skill improvement. That's why HRM and HRD are complementary functions. Human resource development (HRD) is concerned with whether or not HRM policies and practices actually result in employees' learning and development. As HR departments place more emphasis on creative HRM, it is important to examine whether or not HR policies and practices actually contribute to the growth of the organization's human resources. Research that integrates innovative HRM and HRD will provide a central explanation of organizational performance in light of the fact that technological changes will impact the workplace now and in the near future and that organizational innovativeness remains a source of competitive advantage.

The Practical Implications

This literature review may also be helpful for current human resource managers. If they say they want to be innovative, this can help them define what they mean. Human resource professionals can have a more educated conversation about HRM innovation and its attainment by starting with the three approaches identified here and the various subthemes related to them. They might take ideas for new HR policies and procedures from the studies discussed here. For another, it could guide professionals in deciding where to focus their innovation efforts. This research also debunks the myth that businesses need to begin from scratch whenever they implement new HRM practices. By combining these three methods, organizations

can better pinpoint the areas that require their immediate focus. In addition, it is possible that merely making minor adjustments to established procedures is already a form of innovation that is sufficient to keep the business and its employees afloat.

Declarations

Competing interests: The authors declare no competing interests.

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Analyzing the Effect of Financial Constraints on Technological and Management Innovation in SMEs: A Gender Perspective

Dr.Sanjib Pattnaik

Abstract: The aim of this research is twofold: establishing whether access to bank financing facilitates innovation in SMEs and whether such effect can be explained from a gender perspective. Using a sample of 310 Spanish SMEs, this study first examines the effect of alleviating financial constraints on both technological and management innovation through a structural equation model. Then, the moderating effect of gender is examined. Our results showed that (a) relaxing financial constraints helps SMEs to innovate in both technological and management innovation, (b) the effect of the relaxation of financial constraints is significantly greater in companies managed by women, and (c) the moderating effect of gender occurs from the double perspective of technological innovation and management innovation. Our empirical results suggest that the gender of the CEO plays a vital moderating role among innovation and financial constraints, providing new evidence about women's contribution to innovation in SMEs, so these results have practical business and institutional implications as they point out the relevance to promote employment policies that favour the gender diversity of employees at all hierarchical levels of the company.

Keywords: technological innovation, management innovation, financial constraints, gender, SMEs

Introduction

Research on innovation is a persistent topic within the busi- ness sector. Thus, the literature on this subject is extensive with studies at business, industrial, and regional levels (Damanpour et al., 2009; McCann & Ortega-Argilés, 2015). In this context, it's increasingly difficult to ignore the impor- tance of women's role in economic activities, as in recent years they have become more and more prominent in the professional sphere (Ojeda-López et al., 2019), as globaliza- tion has made them more visible in the world of work (Sarada Ramesh, 2013). Although women have made a great effort to grow their businesses in the labour market (Sarfaraz et al., 2014; Zeb & Ihsan, 2020), in general, they seem to be more risk-averse (Langowitz & Minniti, 2007; Nissan et al., 2012). However, the effect of risk aversion on female inno- vativeness has not been clearly analyzed in the previous lit- erature, as most studies have focused on the innovation performed by men, and there is a systematic gap in the research on innovation activities performed by women (Kuschel & Lepeley, 2016).

Nevertheless, business innovation processes have been related to difficulties in accessing financing, showing that the existence of financial constraints affects companies' innovation abilities. Moreover, empirical evidence has dem- onstrated that problems caused by financial constraints are even more obvious for businesswomen due to gender stereo- types (Godwin et al., 2006). Therefore, it seems that gender differences in accessing financing are considered an obstacle to business growth (Coleman et al., 2019).

The aim of this study is twofold: establishing whether access to bank financing facilitates innovation in SMEs and whether the effect of financial constraints on innova- tion can be explained from a gender perspective. For this purpose, we used questionnaires completed by SMEs Spanish managers about their

innovation outputs and the difficulties encountered in accessing bank financing. The data obtained enabled us to build a structural equation model that provides an essential contribution to the under- standing of this innovative field.

Hypotheses Development

Alleviating Financial Constraints and Innovation

Literature related to innovation in business is extensive and includes different approaches to the development of the con- cept of innovation. The first discussions and analyses of this subject were carried out by Schumpeter (1939), who intro- duced the concept of innovation understood as a new produc- tion function. However, this concept has recently been questioned by studies that have demonstrated that innovation is a fundamental tool in business management, as it gener- ates competitive advantages for companies (Carboni & Russu, 2018). In addition, numerous studies have shown that innovative activities involve many aspects simultaneously in the business area, such as new products, new process tech- nologies, and new organizational practices (Heredia Pérez et al., 2019; Johannessen et al., 2001). In this context, the concept of the innovation process is of great importance, as it is defined as a complex and dynamic system of external research, which includes not only an innovative model but also different innovation types (Bucherer et al., 2012; Laursen, 2012; Markides, 2006; Wang et al., 2015).

The classification of innovation has been widely studied in previous research by a large number of authors. One of the first approaches used to establish the types of innovation was that of authors Daft (1978) and Damanpour (1992) who argued that innovation has generally been classified into technological and management innovations to signify the differences among social structure and technology in organi- zations. Technological innovation refers to products, ser- vices, and production processes (Damanpour, 2010), and they refer to methodological changes that allow greater per- formance and efficiency (Antonucci & Pianta, 2002; Kahn, 2018; Terjesen & Patel, 2017; Trantopoulos et al., 2017). However, innovation in management can be defined as "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" (Birkinshaw et al., 2008; Gebauer et al., 2017, among oth- ers). Thus, while technological innovation is linked to the primary work activities of the organization, management innovation is associated with its management (Damanpour, 1991, 2010; Zahra & Covin, 1994).

Financial constraints refer to limited access to financial borrowing (Bigsten et al., 2003; Feder et al., 1990) and is a key factor for innovative development (Fombang & Adjasi, 2018). In this context, the previous literature shows some controversy about the effects of financial constraints on busi- ness innovation. The majority of previous studies provide evidence of the negative effects that financial constraints have on innovation (Efthyvoulou & Vahter, 2016; Fang et al.,

2014; Gorodnichenko & Schnitzer, 2013; Hall, 2002; Hottenrott & Peters, 2012). These adverse effects explain why companies with fewer financial constraints are in a bet- ter position to increase their investments in innovation. Other studies question the effect of financial constraints on innova- tion in firms (Ayyagari et al., 2011; Bond et al., 2005; Harhoff, 1998). This effect would only happen if external finance had an essential role in the supply of capital to the innovating firm (Ayyagari et al., 2011).

In short, previous literature indicates that alleviating financial constraints is an important factor when explaining

business innovation (García-Pérez-de-Lema et al., 2021). Furthermore, there is much more evidence of the negative effects caused by financial constraints on innovation, and these negative effects make businesses with fewer financial constraints more likely to increase their investments in innovation (Cornaggia et al., 2015; Efthyvoulou & Vahter, 2016). Hence, eliminating or alleviating financial con- straints may produce higher innovation outputs in SMEs. Therefore, we propose the following research hypotheses as follows:

Hypothesis 1a (H1a): A reduction in financial constraints will increase technological innovation in SMEs.

Hypothesis 1b (H1b): A reduction in financial constraints will increase management innovation in SMEs.

The Moderating Role of Gender

The role of gender in business innovation has previously been analyzed by a large number of researchers. The gener- alization of the research published to date concludes that gender diversity among employees has a positive impact on the innovativeness of firms (Ritter-Hayashi et al., 2016). This is because gender diversity could increase the interac- tion between different types of skills and knowledge which would contribute to making the firm more open to new ideas and more creative (Østergaard et al., 2011). Thus, the estab- lishment of policies and programs that encourage companies to hire a more gender-diverse workforce plays a key role in business innovation (Østergaard et al., 2011; Ritter-Hayashi et al., 2016).

On the other hand, the obstacle of financial constraints seems to be more pronounced in women due to gender-based stereotypes (Godwin et al., 2006). Hence, a growing literature on female entrepreneurship has examined gender differences in credit markets and the factors that can help female entre- preneurs access finance (Pham & Talavera, 2018). Previous studies show that female entrepreneurs face multiple obsta- cles caused by the lack of opportunities (Panda & Dash, 2014, 2016). However, the available evidence on discrimination against women when accessing bank financing is not conclu- sive either. Being a woman is not a disadvantage when obtain- ing bank loans, as both men and women receive equal treatment (Iakovleva et al., 2013; Lituchy & Reavley, 2004).

But other studies have indicated that women entrepreneurs face many challenges, including gender discrimination, work- family conflicts, financial constraints, lack of infrastructural support, unfavourable business and political environments, lack of training, and limitations due to their personality (Cho et al., 2019; Kemppainen, 2019; Nähllinder, 2010).

In addition, there is a great interest in studying the diffi- culties faced by women entrepreneurs when applying for bank credit (Halkias et al., 2011; Jamali, 2009; Maden, 2015; Naguib & Jamali, 2015; Ramadani et al., 2015). Research shows that this is due to the high-risk category of entrepre- neurs (Thampy, 2010). Women entrepreneurs often have more difficulties accessing credit than men due to weaker credit history, lower remuneration, and inadequate savings (Carter et al., 2007; Sandhu et al., 2012; Thampy, 2010). As a consequence, Sexton and Bowman-Upton (1990) found that, in relation to the four facets of risk (monetary, physical, social, and ethical), women, in general, tend to be more averse to monetary risk. Then, men show a higher propensity for risk due to a greater preference for financial gains. Conversely, women accept less financial gain in exchange for less risk-taking with the firm (Brush et al., 2006). In addi- tion, other researchers suggest that women entrepreneurs are more risk-averse than men because they are less confident in their ability to make financial decisions (Forlani, 2013; Lituchy & Reavley, 2004; Stefani & Vacca, 2015). Therefore, women owners are more likely to prefer low-risk businesses (Kepler & Shane, 2007, p. 53).

Available scientific literature also shows evidence that both the profile of the company and that of its owners influ- ence the nature and extent of financial constraints (Bigsten et al., 2003; Rand, 2007; Tran & Santarelli, 2014). In gen- eral, women entrepreneurs tend to run smaller businesses, thus reducing the chances of accessing bank financing (Stefani & Vacca, 2015). It is clear to some authors that dis- crimination against women may arise from the fact that women-owned businesses tend to have fewer capital (Alesina et al., 2013; Treichel & Scott, 2006; Verheul & Thurik, 2001). Therefore, discrimination against women may arise from the fact that women-owned businesses tend to have a lower amount of equity capital (Pham & Talavera, 2018; Verheul & Thurik, 2001). Consequently, loan approval is problematic as banks are often reluctant to lend to low equity firms (Pham & Talavera, 2018).

In the end, the role of women in accessing credit has been extensively studied in the literature, where it has been shown that women entrepreneurs face a large number of obstacles in accessing bank credit (Halkias et al., 2011; Naguib & Jamali, 2015; Ramadani et al., 2015). On the other hand, the role of women has also been extensively analyzed in the framework of innovation, where it has been shown that, in general, women entrepreneurs innovate less because they are more risk-averse than men (Nissan et al., 2012; Stefani & Vacca, 2015). From these arguments, the following hypotheses are proposed:

Hypothesis 2a (H2a): Gender moderates the positive rela- tionship among alleviating financial constraints and tech- nological innovation, so that the relationship will be stronger for firms managed by women. That is, alleviating financial constraints might reduce the gender gap in SMEs technological innovation.

Hypothesis 2b (H2b): Gender moderates the positive rela- tionship among alleviating financial constraints and man- agement innovation, so that the relationship will be stronger for firms managed by women. That is, alleviating financial constraints might reduce the gender gap in SMEs innovation in management.

Figure 1 shows the research model and hypotheses.

Methodology

Sample

This study uses a sample of 310 Spanish companies ran- domly selected from those that meet the SME criterion in accordance with European Commission Recommendation 2003/361/EC of 6th May 2003. SMEs are economically and socially important because of their contribution to the pro- ductive sector and their adaptability to technological changes. They contribute over 65% of GDP and are responsible for 53.3% of imports and 51.1% of exports in Spain (Eurostat, 2019). This sample size provides a sample error of 5.57% for a 95% confidence interval based on an infinite population. The smallest sample size for this model with 3 latent vari- ables and 16 manifest variables is 296, defining an antici- pated effect size of 0.2, a *p*-value of .05 and a power of 0.80 (Westland, 2010).

The contact details of the companies in the sample were obtained from the Bureau van Dijk's Iberian Balance Sheet Analysis System (SABI) database, and the selection process was based on the principles of stratified random sampling for finite populations, with size and industry as segmentation variables. The size of each segment was implemented accord- ing to the information available in the official statistics of the National Institute of Statistics (INE, 2019). The information on the businesses in the sample comes from a telephone sur- vey addressed to business managers, considering that manag- ers are the most important decision-makers and their points of view and opinions have a significant impact on the company's strategic

behaviour (O'Regan & Sims, 2008; Van Gils, 2005). Respondents who chose not to answer were randomly replaced by others of similar size and sector.

The telephone surveys were conducted from November 2016 to January 2017. A structured interview with a set of Likert-scale questions was used, where the opinion of the respondent was asked about several questions related to the evolution of some aspects of financial constraints and innovation. When making the contact, the interviewer asked to talk to the manager of the company. On speaking

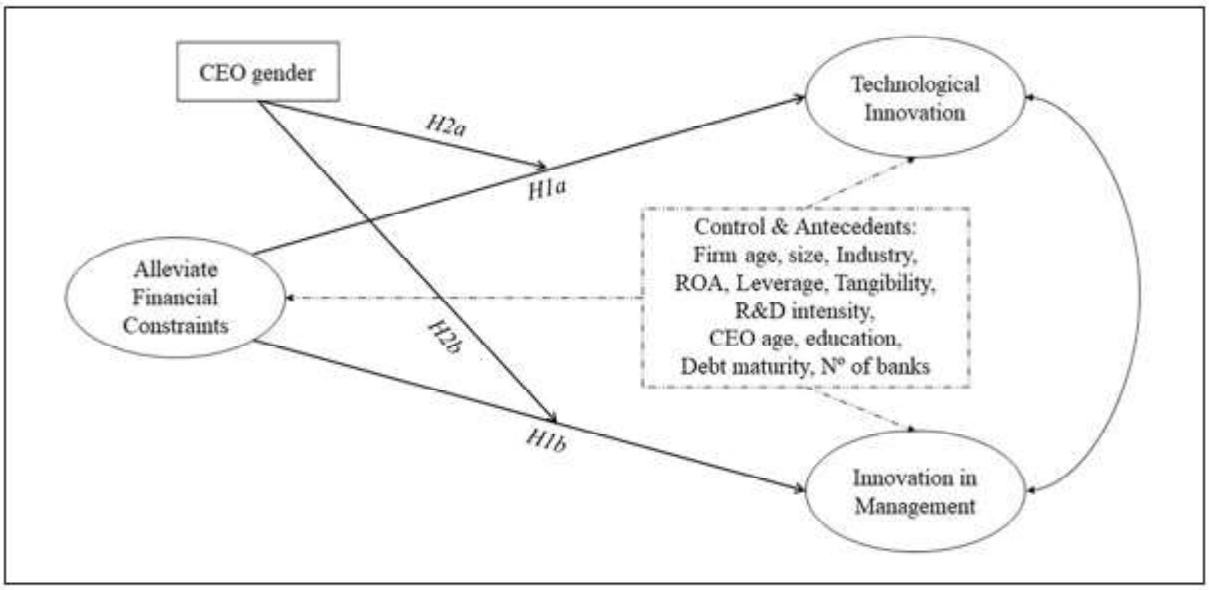

Figure 1. Research model.

to the manager, the interviewer introduced the purpose of the study and ensured the statistical confidentiality of the information.

Table 1 shows the composition of the selected sample. The presence of women is proportionally lower in medium- sized enterprises (6%) than in micro and small enterprises (around 15%). Concerning the sector, construction has the highest percentage of companies managed by women (18%). This ratio of female CEO is similar to those obtained in some previous works in Spanish companies (García Solarte et al., 2012; Herrera Madueño et al., 2016).

Measurements

We measured the managers' perceptions about the evolution of financial constraints and the innovation outputs related to their competitors through multi-item responses on 5-point Likert scales that were based on previous literature.

Regarding the reduction of financial constraints, we used a questionnaire since the utilization of account-based ratios as a proxy for the availability of bank financing do not always accurately measure the situation of the firm (García-Pérez- de-Lema et al., 2021), because it cannot be known if the firm has not applied for financing or if the lenders have refused it (e.g., Savignac, 2008). Hence, the degree of financial constraints was determined by costs, repayment terms, required guarantees, and the volume of bank financing (Amara et al., 2016; Blanchard et al., 2013; Savignac, 2008).

Regarding innovation, we followed a subjective approach to assess both technological and management innovation (Diéguez-Soto et al., 2016), since it seems to be particularly appropriate in SMEs (Hughes, 2003). First, we used six questions to measure technological innovation, three of them are questions

related to product innovation and the other three related to the innovation in processes (García-Pérez- de-Lema et al., 2021; Ruiz-Palomo et al., 2019; Uhlaner et al., 2013). Management innovation was established using four items (Belderbos et al., 2018; Bubou & Amadi-Echendu, 2018).

In addition, the gender of business managers was associ- ated with the gender of the CEO (Carter et al., 2007; Pham & Talavera, 2018).

Finally, 11 antecedent variables on relaxing financing constraints have been considered which have also been used as control variables in the innovation models. These vari- ables are related to the company's profile [age, size, industry, return on assets (ROA), debts, tangible assets, and R&D intensity], to the personal characteristics of the company's CEO (age and educational level), and to the characteristics of the company's banking relationships (debt maturity and the number of banks which the firms work with). Table 2 shows the literal of the questionnaire used to mea- sure these variables as well as the antecedent and control variables.

Results

Factor Analyses and Validation of Measures

Our analysis was carried out using Stata (v.14). We initially assessed the feasible effect of common method variance and the reliability and validity of scales through a double

Table 1. Sample Distribution.

	Male CEO		Female CEO		Total sample	
	N	%	*n*	%	*n*	%
Size						
Micro	119	38	21	7	140	45
Small	97	31	17	5	114	37
Medium	53	17	3	1	56	18
Age (years) ≤5	6	2	1	0	7	2
6–25	161	52	35	11	196	63
26–50	90	29	5	2	95	31
>50 Industry	12	4	0	0	12	4
Manufacturing	84	27	14	5	98	32
Construction	74	24	16	5	90	29
Trade and commerce	58	19	2	1	60	19
Services	53	17	9	3	62	20
CEO education						
Primary	98	32	14	5	112	36
High school	138	45	23	7	161	52
University	33	11	4	1	37	12
CEO age (years) ≤40	35	11	11	4	46	15
41–55	141	45	24	8	165	53
56–70	86	28	5	2	91	29
>70	7	2	1	0	8	3
Total	269	87	41	13	310	100

process. First, we perform an Exploratory Factor Analysis (EFA; Podsakoff et al., 2016) obtaining seven significant factors (eigenvalue > 1) that explain 61% of the variance (15%, 13%, 11%, 6%, 6%, 6%, and 5%, respectively), Cronbach's a = .256. The first factor of the rotated solution corresponds to the financial constraint measures, the second factor to the technological innovation variables, and the third factor to the management innovation measures. The control variables are distributed among the four remaining factors. Afterwards, the factor analysis was repeated only with the measurement variables that compose the factor scales, and three significant factors were obtained that together explain 65% of the variance (24%, 22%, and 19%, respectively), Cronbach's a = .874. Second, we executed a Confirmatory Factor Analysis (CFA) in which two SEM models were tested: one of them was a single factor model, and its results were not acceptable (c^2 = 1,378.6; RMSEA= 0.20; SRMR = 0.18; AVE = 0.31; CFI = 0.5; NNFI = 0.42). This model was significantly different from the second, which considers three factors separately (log-likelihood ratio test c^2 = 1134.4***). These results suggest that the common

method bias was not a concern because the single factor did not comprise for most of the variance (Podsakoff et al., 2003) and because separate individual factors significantly improved the single-factor model (Podsakoff et al., 2012). In addition, possible collinearity issues between measurements were tested by estimating variance inflation factors of items (all below 2.78) and latent factors (all below 1.27).

Table 3 lists the tests carried out to ensure the reliability and convergent validity of the second CFA model, which shows the goodness of fit, suggesting the reliability and con- vergent validity of the model (e.g., Boateng et al., 2018) because the main indices exceed their respective thresholds. Moreover, to check the discriminant validity of the model, Table 4 shows the HTMT ratios-all below 0.85—(Henseler et al., 2015), as well as inter-factor correlations -all of them lower than the squared root of AVE—(Fornell & Larcker, 1981). In addition, a slightly high inter-factor correlation between technological and management innovation suggests the existence of a close relationship between both types of innovation, which has been considered in the model specification facilitating the free covariance between them.

Finally, it is necessary to check that there are no signifi- cant differences in intercepts, loads, and error variances of the manifest variables as a requirement for comparing the results obtained for the two subsamples (Gregorich, 2006). To achieve this, four SEM models have been built to gradu- ally relax the measurement invariance constraints and check if there are significant differences between them using the log-likelihood ratio test for the complete model, and the

Table 2. Variables Definition.

Variable	Item	Description	References
Gender	Mod	Gender of the CEO (1: women; 0: otherwise)	Carter et al. (2007)
AFC			
Alleviate Financial Constraints			
TI			
Technological Innovation			
MI			

Management Innovation

Kindly evaluate the progress (1: absolutely unfavourable, 5: absolutely favourable) throughout the preceding 2 years concerning:

fc1 The amount of financing offered by banks

fc2 The commissions requested by the banks

fc3 The endorsements or pledges wanted

fc4 The interest rates offered

fc5 The time the bank takes to answer

fc6 The deadlines to repay the debt

Kindly evaluate the progress of your firm with respect to its competitors (1: absolutely unfavourable, 5: absolutely favourable) throughout the preceding 2 years concerning:

ti1 The number of new products or services launched by your firm

ti2 The pioneering nature of your firm in developing products or services

ti3 The quick response to the new products or services developed by competitors ti4 The number of changes in the processes launched by your firm

ti5 The pioneering nature of your firm in developing new processes

ti6 The quick response to the new processes developed by the competitors

Evaluate the progress of your firm with respect to its competitors (1: absolutely unfavourable, 5: absolutely favourable) throughout the preceding 2 years concerning:

mi1 The number of changes in the management systems of your company

mi2 The level of update of the most advanced management systems

mi3 The level of information available to managers about the management systems of more success

mi4 The pioneering nature of your company to introduce new management systems

García-Pérez-de-Lema et al. (2021) and Savignac (2008)

García-Pérez-de-Lema et al. (2021), Hughes (2003), and Uhlaner et al. (2013)

Belderbos et al. (2018), Bubou and Amadi-Echendu (2018)

Control

c1 Firm age Caggese (2019), variables and antecedents

c2 Firm size (average number of workers in 2016)

c3 NACE code (2-digits)

c4 Return on Assets 2016 (EBIT/Total Assets)

c5 Debt ratio 2016 (Total Debt/Total Assets)

c6 Tangibility 2016 (Tangible assets + stocks)/Total assets

c7 R&D intensity 2016 (R&D assets/Total assets)

c8 CEO Age

c9 CEO education (1: Primary; 2: High School; 3: University)

c10 Debt maturity 2016 (Short-Term Bank Debt/Bank Debt)

c11 Number of banks which the firm works with (6: six or more)

Diéguez et al. (2016), García-Pérez-de- Lema et al. (2021), and Lee et al. (2015)

Wald test for each individual coefficient (Putnick & Bornstein, 2016). Table 5 summarizes the results obtained. As there are no significant differences between the models according to the constraints imposed on the external model and considering that only two error variances (afc5 and ips1) are significant at a $p <$ .05 level, the model does not raise any doubts on the invariance of its measurements.

Hypotheses Testing

To contrast the effect of the reduction of financial constraints on technological and management innovation (H1a and H1b), the significance of the internal model for the entire data set has been used. To contrast the moderating effect of the CEO's gender (H2a and H2b), a multi-group analysis was carried out in two phases: initially, measurement invari- ance is ensured (see Table 5). Then, using Wald's test, we check whether the difference in betas among the two groups considered is significant.

Once the reliability and validity of the model and the comparability of the results between both subsamples have been ensured, Table 6 and Figure 2 show the results obtained by the model for the whole sample, for companies managed by men, and for companies managed by women. They dis- play the result of Wald's test to identify which coefficients are significantly different for companies run by men and women. Only significant paths in at least one subsample are listed.

Our results suggest that relaxing financial constraints makes it easier for SMEs to adopt policies that allow them to innovate, which is reflected in higher innovation outputs, both in technology (b = .25***) and in management (b = .18**). Also, companies managed by women are signifi- cantly more likely to increase innovation achievements when

Table 3. Reliability and Convergent Validity

	M	*SD*	l	*SE***	s^2	R^2	
Convergent validity and reliability Alleviating financial constraints (AFC)							
fc1	3.42	1.28	.71	.03	.50	.498	AVE: 0.57
fc2	2.77	1.27	.76	.03	.42	.583	α: .89
fc3	2.80	1.30	.76	.03	.42	.583	CR: 0.88
fc4	2.77	1.22	.75	.03	.43	.567	
fc5	3.16	1.25	.74	.03	.46	.541	
fc6	3.16	1.15	.75	.03	.44	.565	
Technological innovation (TI) ti1	3.20	1.15	.57	.04	.67	.328	AVE: 0.51
ti2	3.33	1.18	.69	.03	.53	.475	α: .87
ti3	3.09	1.07	.64	.04	.59	.406	CR: 0.86
ti4	3.12	1.08	.74	.03	.46	.541	
ti5	3.13	1.22	.86	.02	.26	.744	
ti6	2.96	1.01	.76	.03	.43	.570	
Management innovation (MI)							
mi1	3.10	1.13	.62	.04	.62	.380	AVE: 0.54
mi2	3.29	1.11	.74	.03	.46	.544	α: .84
mi3	3.43	1.05	.72	.03	.48	.525	CR: 0.81
mi4	3.08	1.15	.85	.03	.27	.727	

Note. RMSEA: 0.070; SRMR: 0.055; CFI: 0.94; TLI: 0.94; NFI: 0.91; CD: 0.996; c^2: 244.4. *SD* = standard deviation; l = standardized loadings; *SE*** = standard errors of loadings (all the loadings and intercepts are significant at a 99% level); s^2 = variance of errors; R^2 = equation-level coefficient of determination; AVE = average variance extracted; a = Cronbach's alpha; CR = McDonald's composite reliability; RMSEA = root mean squared error of approximation; SRMR = standardized root mean-

squared residuals; NFI = normed fit index; CFI = comparative fit index; TLI = Tucker-Lewis non-normed fit index; CD = coefficient of determination (overall R^2).

Table 5. Measurement Invariance Assessment. Log-Likelihood Ratio Tests.

AFC	**0.75**	0.29	0.37		χ^2	*df*	*p*-Value
TI	*0.27*	**0.71**	0.66	Model A vs. B	23.21	20	.279
MI	*0.18*	*0.69*	**0.74**	Model A vs. C	44.08	36	.167
				Model A vs. D	57.71	49	.184

Note. Fornell-Larcker criterion: Inter-Factors Correlations below the diagonal (*cursive*); AVE^2 in diagonal (bold). AFC = alleviating financial constraints; TI = technological innovation; MI = management innovation; HTMT ratio over the diagonal.

they reduce their financial constraints (b = .79*** and

b = .75***, respectively), compared to companies managed by men (b = .18*** and b = .13***, respectively), staging significant Wald tests (c^2 = 6.50** and c^2 = 4.31**, respec- tively). In short, the effect of relaxing financial constraints on innovation is significantly higher in women-led enter- prises than in those managed by men. On the whole, this may be due to the fact that women entrepreneurs tend to run smaller businesses, thus diminishing the possibility of accessing bank financing (Stefani & Vacca, 2015). In addi- tion, women entrepreneurs face multiple barriers regarding the lack of employment opportunities, since they have lim- ited resources (Panda & Dash, 2016). This fact could mean that, once such restraints on resources are lifted, the effect generated is greater than in companies run by men, who seem to be less accustomed to overcoming such challenges.

Model B vs. C	20.87	16	.184
Model B vs. D	34.5	29	.222
Model C vs. D	13.63	13	.401

Note. Wald tests only were significant for one load (fc5*) and for three variances of item errors (fc5***, ti1**, and ti2*). Model A: Loads, intercepts, and error variances are set as invariant—strict invariance model. Model B: Loads and intercepts are set as invariant—strong

invariance model. Model C: Loads are set as invariant—pattern invariance model. Model D: Neither load nor intercept nor variance of errors is set as an invariant-unrestricted model.

*$p < .1$. **$p < .05$. ***$p < .01$.

As for the background that alleviates financial con- straints, the size of the company, the sector, business prof- itability, the level and maturity of debts, and the number of banks with which the company operates are generally important. This suggests that the characteristics of the company, those of the owners, and those of the banking relationships influence the nature and the extent of the financial constraints. These results are in line with previ- ous findings (Bigsten et al., 2003; Rand, 2007; Tran &

Table 6. Inner Model Results

Path	Whole sample		Male CEO		Female CEO		Wald test	
Model	β	*z*	β	*z*	β	*z*	χ^2	*p*-Value
AFC→TI	.25	3.56***	.18	2.40**	.79	5.93***	6.50	.011**
AFC→MI	.18	2.46**	.13	1.70*	.75	5.15***	4.31	.038**
Size→AFC	.19	3.17***	.19	2.96***	–.01	–.05	0.70	.403
Industry→AFC	–.13	−2.18**	−.13	−2.01*	–.20	–1.13	0.06	.813
ROA→AFC	.17	2.88***	.21	3.29***	–.11	–.69	1.91	.167
Leverage→AFC	–.14	−2.21**	−.10	−1.41	–.33	–2.01**	1.50	.221
Debt maturity→AFC	.14	2.51**	.16	2.49**	.01	.04	0.34	.559
Nº of banks→AFC	.17	2.90***	.14	2.12**	.14	.83	0.02	.895
Firm age→TI	.06	.99	.08	1.18	–.30	–2.18**	5.03	.025**
Leverage→TI	.06	.87	.05	.65	.36	2.42**	3.36	.067*
Firm age→MI	.11	1.76*	.13	1.90*	–.28	–1.99**	5.08	.024**
Size→MI	.05	.74	.05	.65	.32	2.38**	2.72	.099*
Leverage→MI	.05	.72	.02	.29	.38	2.46**	3.17	.075*
R&D Intensity→MI	–.12	−1.93*	−.13	−1.97**	.20	1.65*	2.43	.119
e.TI↔e.MI	.68	16.00***	.65	13.47***	.77	5.52***	3.76	.052*
Goodness of fit	χ^2	RMSEA	SRMR	CFI	CD	R^2(AFC)	R^2(TI)	R^2(MI)
Whole sample	399.2	0.046	0.041	0.939	0.269	.183	.102	.092
Male CEO	386.1	0.048	0.045	0.935	0.265	.182	.075	.085
Female CEO	452.8	0.147	0.103	0.643	0.821	.356	.655	.654
Grouped model	838.9	0.069	0.080	0.873	0.267	—	—	—

Note. Antecedents and control variables only are reported whether they are significant at a 95% level at least in one model. b = standardized coefficients;

z = *z* statistic (b/*SE*); e.TI«e.MI = error covariance of Technological and Management Innovation.

*$p < .1$. **$p < .05$. ***$p < .01$.

Santarelli, 2014). However, their effects are not signifi- cantly different depending on the CEO's gender, therefore there are no moderating effects for this variable.

Additionally, the study also found that none of the control variables in the general sample was significant at 95% for either TI or MI, although in companies managed by women the influence of company age and debt was indeed signifi- cant for both TI and MI. Furthermore, size also significantly affected management innovation in this segment. Moreover, the differences between companies managed by men and women were significant in terms of the company's age on TI and MI. These findings are in line with previous studies and contribute to the empirical evidence that gender diversity among a company's employees has a positive impact on innovation (Østergaard et al., 2011), especially in developed countries (Ritter-Hayashi et al., 2016).

Finally, Figure 3 illustrates the moderating role of gen- der on the relationship among the access to bank financing and innovation. These results indicate that companies run by women adopt a much more conservative position than those run by men in the presence of financial constraints. However, when these financial constraints are lowered, the propensity to innovate more is much higher in companies with a female CEO than in companies with a male CEO. In fact, when financial constraints are eased, the difference between the two segments is much smaller, suggesting that

the gender gap in innovation could be significantly reduced thanks to facilitating access to bank financing for compa- nies with female CEOs.

In this sense, our results confirm that financial constraints have a negative effect on business innovation, so

reducing them will increase the innovativeness of firms. These results agree with those obtained in the previous studies of Efthyvoulou and Vahter (2016), Fang et al. (2014), and Gorodnichenko and Schnitzer (2013). Furthermore, these results have reinforced those proposed by the authors Sandhu et al. (2012) and Thampy (2010) by showing that gender has a moderating effect on the impact of financial constraints on innovation. However, these results contrast with those of the authors Iakovleva et al. (2013) and Lituchy and Reavley (2004) that ensure that there is no discrimination against women in accessing bank financing, and with those of Stefani and Vacca (2015) which show that women are more risk-averse than men. Our study then contributes to the existing literature by providing conclusive evidence that the gender gap in innovation could be significantly reduced thanks to facilitating access to bank financing for companies with female CEOs.

Conclusions

In the existing literature, innovation is considered as an important requirement for business development and growth.

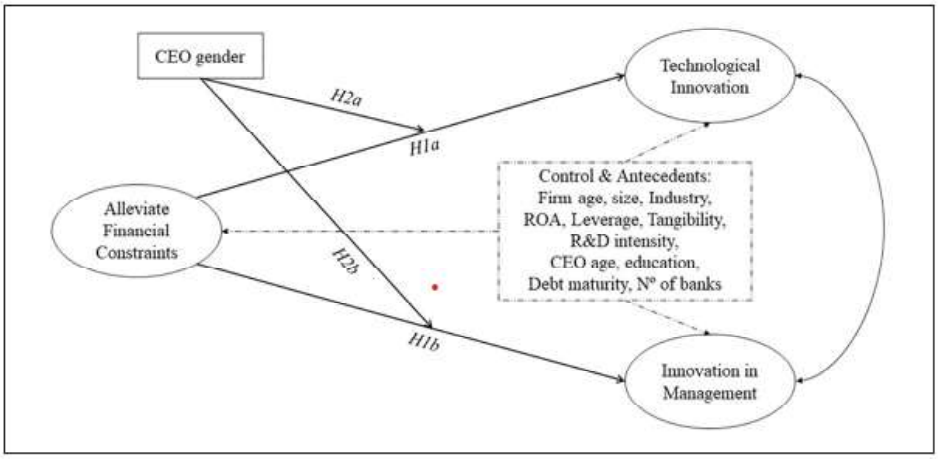

Figure 2. Results.

*p < .1. **p < .05. ***p < .01.

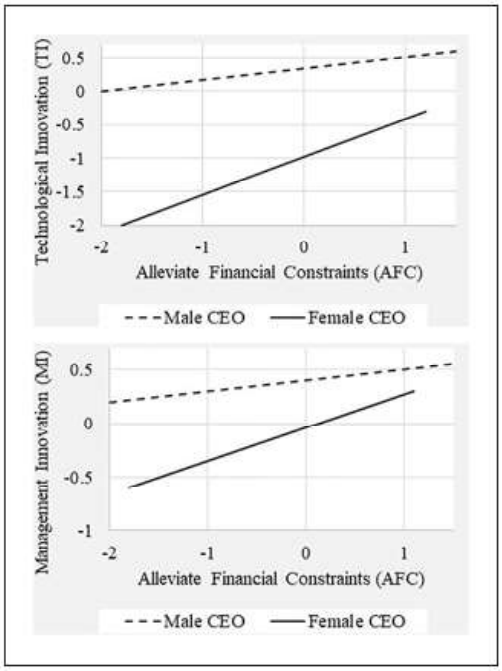

Figure 3. Moderation effects.

Similarly, this innovative progress has increased as women have been gradually joining business management. However, although the literature analyzing the factors that influence innovation is extensive, the impact of financial constraints and gender diversity has not been sufficiently studied. Therefore, this research aimed to provide new evidence to the study of the influence of gender diversity on innovation in Spanish SMEs.

Firstly, our results confirm that financial constraints have a negative impact on business innovation, as reducing them increases businesses' innovation ability. Furthermore, this impact occurs in both technological and management innova- tion. Secondly, the presence of women in business manage- ment means that an improvement in finance access has a very positive effect on the innovation output, which would suggest that the gender of CEOs has a moderating effect in this field. Thirdly, the aforementioned moderating effect of women occurs in both innovation types, regardless of the line of busi- ness and other aspects of the company such as age or size.

Our empirical results provide new information about women's contribution to innovation in SMEs, showing that the more involved in management women are, the greater the effect of relaxing financial constraints on innovation. Analogously, our findings have practical business and insti- tutional implications as they point out the influence of gen- der, unveiling the convenience of promoting the access to bank financing for companies managed by women, as well as employment policies that favour the gender diversity of employees at all hierarchical levels of the company.

The study is regionally oriented within Spain, so it cannot provide evidence at the international level. Therefore, future research could compare our results with the business envi- ronment in other countries, including those that are under development. It is relevant that future lines of research might validate our findings in other regions or countries since we are discussing the role of gender in a heavily male-domi- nated organizational context, and this is a common charac- teristic of SMEs all around the world. However, the role of gender might look quite different from other regional con- texts where this same question is still quite important. In this sense, generalizing our findings from a multicultural per- spective might provide a deeper knowledge about women's contribution to innovation in SMEs. Also, future research could further analyze the moderating effect of gender diver- sity in innovation through longitudinal studies of panel data to test the hypotheses raised in this work.

Declaration of Conflicting Interests

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Availability of Data and Materials

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zrkxwkfvzf.1.

Code Availability

Software application: Stata, v. 14. Statacorp.

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Innovative Ideas In Human Resource Management

17

Dr.Soumya Mishra

Abstract: Human resource management plays a pivotal role in any firm in the smooth operations of a business firm. Initially the HR department was considered mere administrative overhead. The HR role comprises of human resource planning, payroll management, compensation management, training and development, employee database, etc in the organization. Firms are emphasizing on converting their each employee as talented asset so as to retain in the long run. Technological innovations influences business efficiency, productivity, costs, relationship with clients, retention of market share, customer satisfaction and growth. HRM is heading towards strategic partnership, business competency, talent management and flexibility. Trends in Human resource management have changed the way the organizations operate. It thrives to increase the success ratio in today's competitive global environment to be successful and survive for a long period of time. The HR solutions can be taken to a new level only when gap between industries and educational institutions are built carefully. This is possible with introduction of new courses which comprises a blend of theoretical as well as hands on practical exposure to the students. Some companies offer very attractive package of benefits to the employees who would opt for VRS. Such schemes are often referred to as GOLDEN HANDSHAKE scheme. Innovations can be referred as the process or outcomes in business in the form of generation of fresh ideas, development of products and services commercializing the same in HR solutions. The competitive advantage built on the grounds of HR innovations can't be imitable resulting in the sustainability of the firm's growth. The changing demographics also will exert increasing pressure for organizations to innovate in the field of HR. The degree of HR innovations depends upon the degree of newness, creativity, extent of changes, number of employees affected, nature of business and outcomes. Emerging conceptual trends comprises of collaborations, integrated services, leverage technology, work life balance, talent management and social media. Recent technological implications in the field of HRM are big data, real time succession planning, Virtual conferences, HRIS, Six sigma, robotics, community management and lean management. Innovative ideas practiced focus on networking, business value creation, employee engagement, creating competitive advantage, strategic objectives and human resource planning.

Key Words: HRIS, Big data, Technology, Talent management, Innovations.

1. INTRODUCTION:

Human resource management plays a pivotal role in the smooth operations of a business firm. Initially the HR department was considered to be as an administrative overhead. The HR role comprises of human resource planning, payroll management, compensation management, training and development, employee database, etc in the organization. In recent times, Human resource management is involved in succession planning, business continuity planning, workforce diversity, labor relations and other aspects which includes mergers and acquisitions.

In order to measure and control the various techniques in Human resource management, HR accounting is

taken into consideration. This is based on HR input which includes placement and training vs. profit which generally includes skill, enhancement, immediate result and easy problem solving methods along with time management. Due to the emergence of various trends, organizations have become more global in markets and the way they carry on their activities and operations, at the same time they also experience higher levels of risk and uncertainty. The disorderly nature of globalization increases the need for organizations to be more elastic and supple. To add on to this there will even be an increased political and social pressure for ecological and societal responsibility. Organizations face various challenges due to economic and demographic imbalances. Some companies offer very attractive package of benefits to the employees who would opt for VRS. Such schemes are often referred to as GOLDEN HANDSHAKE scheme. While the golden handshake scheme offered by some companies in the past worked very well, the offers made by some companies recently failed to elicit the required response from the workers.

Innovations have proved to be a source of competitive advantage in any business firm. Technical innovations in the field of human resource are considered as the key factor in today's firm in measuring firm's performance. It has remained an era of ambiguity, primarily because the impact of such edge on the organization's performances. The competitive advantage built on the grounds of HR innovations can't be imitable resulting in the sustainability of the firm's growth.

Innovations can be referred as the process or outcomes in business in the form of generation of fresh ideas, development of products and services commercializing the same in HR solutions in the form of management activity, practices, programme, system adopted by the firm which is new and value creation to the firm.

2. Review of Literature:

Lee Dyer and Todd Reeves. 2006. "Human resource strategies and firm performance: what do we know and where do we go?" The international Journal of Human Resource Management. Vol 6. Issue 3. This article emphasis the links between human resource strategies and organizational effectiveness. It is more about analyzing the productivity of the employees with respect to type of strategies applied by the firm.

Orlando C, Richard and Nancy Brown Johnson. 2010. "Strategic human resource management effectiveness and firm performance". The international Journal of Human Resource Management. Vol 12. Issue 2. This paper focuses on is there any effect of strategies on the organizational outcomes. It also considers the effective use of human capital on firms' performance.

Carl F. Fey. 2011. "The effect of human resource management practices on firm performance in Russia". The international Journal of Human Resource Management. Vol 11. Issue 1. This article is about the implementation of various HR models integrated with technology on evaluating the performance of firm and HRM practices.

Conference on 'HRM, Technology and Innovation: Back to the Future' held at the University of Twente says: "Research suggests that traditional HRM activities are gradually moving away from HR advisors and HR managers: HRM responsibilities are devolved to line managers and supervisors, shared service centers anticipate to transition into transformational HRM service provision and organizations are planning to further digitize HRM services in the cloud or by installing mobile apps."

3. Key Human Resource Activities:

The key activities performed by the HR personnel in a firm comprises of as below: Recruiting talent to fit

strategy

- Controlling operational costs
- Bridging the gap between expectations and needs
- Retooling the skill-sets
- Succession planning
- Phased retirement
- Facilitating employees embrace diversity
- Crafting, managing an interactive, high performance and customer focused
- Developing pen and accurate communication networks
- Value added integration through partnership
- Facilitating and leveraging technology

4. Innovative Conceptual Trends:

The firms undergo the changes in HRM as a robust facet of their organizational culture enhancing the future scope for development and also to ensure in bridging the gap between current and upcoming requirements. Some of the exceptional concepts being evolved in the recent times are as below:

Fig 1: Innovative concepts in human resource management

- HR department emphasis on integrating Human resource solutions to a firm like process improvement, talent management, training and development, appraisals, data management, pay roll etc through HR expert centers.
- Application of human resource management information system comprises of robust business system which focus on HR models, operations to ensure effectiveness in functionalities.
- The firms have been working on various simulation models to ensure there is balance striking between work and personal life and also to balance work life.
- Talent management by the firm is widely spreading across the globe due to primary focus on empowering the firm with talented employees in relation to retention and development of such employees.
- Back end operations comprises of providing integrated HR solutions to the firm, customers and clients.

• Social media has been extensively used by the firms to manage human resource planning and management.

5. TECHNOLOGICAL INNOVATIONS:

Technology is the integration of technical skills, methods, processes and knowledge which are applied in streamlining the business operations with respect to products and services which are embedded in the business with computers, devices, machines and factories.

Fig 2: Components of technological applications in HRM

• **Big data:** It refers to the use of data analytics in various HR solutions to ensure optimal use of resources, effective decision making, increasing productivity, talent management adding value to the critical business operations.

• **Mobile solutions:** It is one of the recent trends where some firms provides business solutions through smartphones with integrated efforts using virtual tools like Oculus rift and also with customized apps.

• **Real time:** The blend of technology and data analytics has enables a far more effective succession management with real time implications in the firms in strategic decision making.

• **Robotics:** The introduction of robots in the organizations facilitates in robust memory, consists of no emotions, analysis of both internal and external data during conferences, board meetings, etc creating an edge in competition.

• **Virtual conferences:** It is the way where people can interact virtually testing their strategic decisions through simulations, prototype models before actually implemented in the firm with respect to human resource through the common platform.

• **HRIS:** It is one of the information systems where front end, back end and middle end operations of the business with respect to HR activities are integrated with the support of an effective information system technology.

• **Community management:** It is the emerging trend in a firm with respect to recruitment that results in paradigm shift from reactive to proactive methods of creating communities around the framework of an organization trying to connect with people easing the process of recruitment like LinkedIn, Academia etc.

- **Six sigma:** It is a disciplined, data driven approach and methodology for eliminating defects deviating from the standards. This is more effectively used for performance appraisals in a firm.

- **Lean management:** It is an approach in running the firm that supports through continuous improvement in productivity, systematic and incremental changes in the processes in order to improve efficiency and quality by elimination of wastage of resources within the system.

6. INNOVATIVE PRACTICES:

Innovations can be referred as the process or outcomes in business in the form of generation of fresh ideas, development of products and services commercializing the same in HR solutions in the form of management activity, practices, programme, system etc adopted by the firm which is new and value creation to the firm.

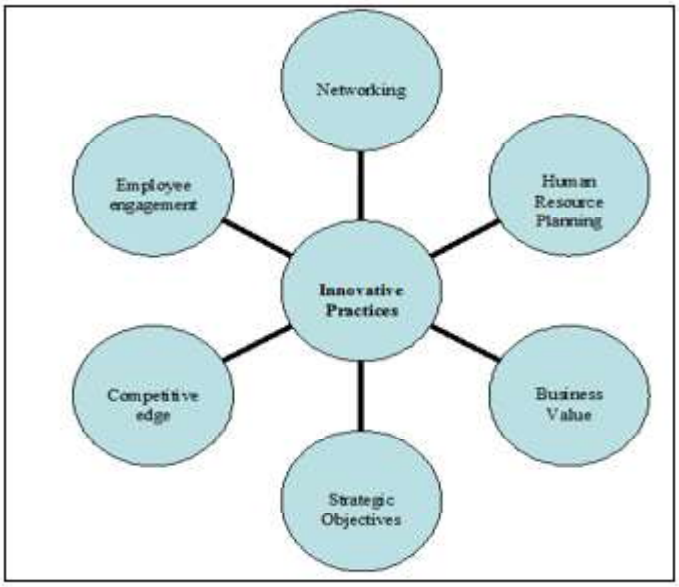

Fig 3: Innovative practices in human resource management

- **Networking:** It is an excellent form of being connected within the organization, Consultancies, colleges, industry experts and similar firms that ensures there is always flow of timely communication bearing fruitful results for a firm. Some of the commonly used platform is LinkedIn, gamification, Facebook. Some of the customized apps are designed for the same as well.

- **Human resource planning:** HRP is the key element of human resource management emphasizing on all the functions of the management integrated with recruitment, selection, training and development, performance appraisal, compensation management, HR auditing. Some of the innovative practices comprises of removing job descriptions and instead customizing jobs as per talents, talent pooling, searchlight meetings for the employees, raising the benchmarks for employees through their self-appraisals virtually and applying big data, keeping rivals out of the staff pools. Introducing technologies like skype, video conferences during recruitment and selection.

- **Employee engagement:** It refers to reverse mentoring, E- Orientation, mandatory vacation, transferring unused leaves to peers and free look period where employees are blended with firm.

- **Business value:** The firm must focus on creating value addition through HR solutions like simulation model, corporate social responsibility (CSR), lean management, back end operations for human resource operations etc.

- **Strategic objectives:** This is primarily relied on the collaboration efforts of firms, talent diversification, scraping organizational charts, creating idea banks through brain storming, reverse brain storming, mind mapping, removing job titles and industry – educational institution MOU for designing the curriculum.
- **Competitive advantages:** It can be created by strong organizational culture, extensive knowledge sharing and integration, employee health, millennium global talent management, HR counseling, employee emotion quotient and human index.

7. CONCLUSION:

Human resource management is considered to be a process of bringing people and organizations together. Innovation in HRM facilitates in identifying the global trends affecting human resources management, illustrates the effect that these trends are influencing on organizations. The innovations in human resources management widen a positive reception of the changing role of human resources solutions in an organizational plan and policy. Organizations can utilize HR innovation to gain competitive advantage that paves way in creating business value and develops brand image. The degree of HR innovations depends based on the degree of newness, creativity, extent of changes, number of employees affected, nature of business and outcomes. Global reach out has created emphasis on the firms in designing a new framework integrating the technology, emerging concepts and business operations. HRM innovations must focus on reducing the turnaround time in fixing and addressing the problems of stakeholders and internal human resource. HR innovations facilitate firms in employee retention, creating USP, branding and reaching customer satisfaction. Success rate and sustainability in the industry is more among the firms adapting themselves to the innovations in their business.

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Innovation in Business-to-Business Marketing

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Dr.Subhranshu Pattnaik

Innovation in Business-to-Business Marketing

Prelude – overview and impetus for this colloquium-based thematic issue Unprecedented advances in the pace of information and communication technologies have transformed how B-to-B firms approach their markets and con- duct business (Gupta and Woodside 2006). As a result, new business models are adopted by B-to-B firms from a wide variety of industries, e.g. banking, insurance, consultancies, transport, advertising and marketing agencies, and e-retailing industry. For example, Amazon, initially a B-to-C firm, has become a platform for the sale of goods from other suppliers, as well as a cloud-services platform used by many banks. Such innovation in B-to-B marketing trans- lates a shift in a firm's vision, mission, strategies, technological prowess and market performance (Simmons, Palmer, and Truong 2013).

To-date, B-to-B research has examined the success factors for B-to-B firms, but with less attention being paid to innovation per se in B-to-B marketing (Aarikka-Stenroos et al. 2017). This has resulted in limited knowledge of the new business models adopted by B-to-B firms as well as their B-to-B mar- keting strategy, and this could affect the theory and practice of B-to-B marketing (Rodriguez 2016). The need to address innovation in B to B marketing pro- vides the topical basis for this issue of the *Journal of Business to Business Marketing*.

Against this background, the development of this issue is inspired by both the aforementioned advances and incubated at the 4th Academy of Marketing B-to-B Marketing Colloquium organized in Bournemouth, UK, 6th October 2017. This issue in "Innovation in Business to Business Marketing," itself an innovation was developed further and pri- marily by Nektarios Tzempelikos (Anglia Ruskin University, Lord Ashcroft International Business School) and Kaouther Kooli (Bournemouth University, Business School) in tandem with *JBBM* guidelines and Editorial guidance over most of 2018. And, as a result, seven (7) articles discussing the latest thinking about aspects of innovation in business-to-business marketing are presented. Specifically, the main objective was to continue the dialogue on how innovations can be embedded in B-to-B marketing practices and how to make research focusing on this topic more relevant and rigorous. We next elaborate on the specifics of these articles herein.

At this point, we would like to express appreciation to David Lichtenthal, *Journal of Business-to-Business Marketing Editor* for welcoming this idea and for kindly allowing us to develop it and co-editing based on the community of scholars that assembled at 4th Academy of Marketing B-to-B Marketing Colloquium organized in Bournemouth, UK, 6th October 2017. Their participation and engaging on these innovation matters were paramount. After all, the birth of commercial education itself can be legiti- mately traced to England and several countries in Europe (Backhaus 2015; Baker 2015) with rollout to the States, Canada and Asia then and beyond (Lichtenthal, Tzempelikos, and Tellefsen 2018, 41–42).

And, as the readers of this journal may recall the *JBBM* had a dedicated issue on "Internet Integration into Business Markets" (https://www.tandfonline. com/toc/wbbm20/11/1-2?nav=tocList). Those eight (8) papers

in 2004 were among the earliest attempts within B to B literature to better understand and explain internet and web-based resources impacting tactical marketing building that theme made by (Lichtenthal and Eliaz 2003; Sharma 2002; Sharma and Sheth 2004) and many others at that time with their work across the business marketing mix. This issue takes similar slant (Lichtenthal 2004) and struc- ture for examining internet and web-based impact on innovation while reflecting on those earlier papers as extant literature or as backdrop. In fact, Bill Cohen, Publisher of the Haworth Press had called upon all his Editors to have special issues involving internet impact on the domain and subject matter of their respective journal titles as the new millennium was getting underway.

We begin with Suraksha Gupta, Michael Czinkota, and Sena Ozdemir's article "*Innovation in Sustainability Initiatives through Reverse Channels*". The authors focus on an important notion, reverse channels, which represent an innovation in sustain- ability initiatives that uses the channel-based business function as a closed loop supply chain. The authors examine the role played by a brand in creating value for business customers through the adoption of reverse channels by presenting a research agenda in the form of a conceptual framework. The research agenda discussed in this paper is based on the argu- ment that a brand provides an assurance of the quality and functional capability of the products to new users of old products, delivers rational benefits to business customers, and strengthens the customer base of manufacturers. The findings suggest that a brand can enhance customer equity, growth of the business customer and profits of the business customer by increasing in its efforts to influence the adoption of reverse-channels.

This article is followed by "*What drives B-to-B marketers in emerging countries to use social media sites?*" by Kaouther Kooli, Nektarios Tzempelikos, Pantea Foroudi, and Seif Mazahreh. Building on the argument that B-to-B marketers in emerging countries still lag behind compared to peers in developed countries in terms of the use of social media sites, the study explores the factors influen- cing the use of social media sites by B-to-B firms in emerging countries. The authors test their hypotheses on 158 firms in Jordan by means of structural equation modeling. Perceived useful- ness, perceived utility, and result demonstrability were found to significantly influence the intention to use social media. However, perceived usability of social media sites did not have any influence on B-to-B marketers' intention to use those sites.

Tim Hughes and Mario Vafeas contribute the third article titled "*Marketing agency/client service-for-service provision in an age of digital transformation*". Their work represents an interesting effort to use insights from the Service-Dominant Logic (S-D Logic) theory to explore changes in agency/ client value co-creation, at a time when digital transforma- tion is having a major impact on the marketing com- munications process. Building on empirical data from clients and their agencies, the authors found that while much digital marketing appears to have initially been provided externally there seems to be a trend to bring these aspects of service in-house. The views of clients and agencies on their relationship, as being either transactional or a partnership, appear to be related to the degree of service required and provided. The next article is by Len Tiu Wright, Robin Robin, Merlin Stone, and Eleni Aravopoulou. In "*Adoption of Big Data Technology for Innovation in B2B Marketing*" they develop a conceptual fra- mework, supported by four case studies, to explore the use of big data in innovation and market leadership in B-to-B relationships. The study shows that organizations are recipients of and are collectors of big data, partly created by the increas- ing volume of business and customer transactions online. In addition, big data and its analytics and applications can be taken as indicators of organi- zations' ability to innovate to

respond to market opportunities. The study highlights the role of big data in business innovation, specifically in B-to-B organizations and where their innovation can transform customer experience at the end of the value chain, i.e. with final consumers.

The fifth article titled "*Mobile tech: Superfood or super fad of creative business?*" by Elvira Bolat. Bolat investigates the mobile technology deployment and its role in innovation practices of creative B-to-B firms. Based on empirical data from business decision- makers from the 31 UK creative B-to-B agencies, the study shows that mobile technology is in fact a superfood that with the right combination of resources and capabilities delivers strategic benefits for creative B-to-B businesses. It is the interaction between mobile technology resources and mobile technology capabilities to stimulate and facilitate pro- cess and product innovation practices. The study signals that business decision-makers can deploy mobile technology to effectively manage operations or/and produce new solutions.

The sixth article is titled "*Co-creating with interme- diaries: Understanding their power and interest*" by Nathalia Tjandra, John Ensor, and John Thomson. Employing a case study approach, the study aims to explore the role of independent financial advisers (IFAs) in co-creation activities and identifies how their power and interest can be used to determine their level of involvement in co-creating innovation of new products and services in the financial services sector. The findings of this study indicate that inde- pendent intermediaries, such as IFAs, have a significant influence on the end customers' view on financial services brands and they partially con- struct the provider's brand value which is perceived and received by the end customers.

The final article in this dedicated issue is titled "*Evaluating constitutive dimensions of CSR e-communication: A comparison between* '*Business-to- Business*' *and* '*Close-to-Market*' *companies*" and is contributed by Maria Palazzo, Agostino Vollero, Pantea Foroudi, and Alfonso Siano. The authors explore the role of Corporate Social Responsibility (CSR) communication in B-to-B firms. Through a content analysis research design, the study explores how companies communicate on corpo- rate websites their CSR efforts, applying a four- dimensional model. The study indicates that Business-to-Business (B-to-B) companies are more prone than Close-to-Market (C2M) organi- zations to be engaged in the disclosure both of CSR orientation (i.e. how their value statements reflect their commitment to sustainability) and structure (i.e. how they communicate their gov- ernance structure and certifications of CSR and how they engage with stakeholders). The study points out the constitutive dimensions and the diverse motivations that can push companies to adopt specific approaches in CSR disclosure.

Interlude

What we found mostly in common in this set of articles is that the innovative process has changed from individual (person or organization) innova- tor to innovation involving multiple (people or firms) innovators cooperatively. We have only just begun with embedding both.

A key message that emerges is that firms should leverage their own capabilities (e.g. managerial learn- ing, knowledge acquisition capability) to play up their strengths to overcome many institutional constraints to enhance innovation and successfully introduce product/service changes to the marketplace.

This collection of articles also contributes to a better understanding of B-to-B problems, and the marketing concerns of practitioners and indus- try as per Rodriguez (2016) call, and shed light to innovation in B-to-B research by providing a broad look at issues that deserve more attention from practitioners and

academic researchers. In addition, this issue provides some directions for future research to explore more deeply and thus advance our field.

Looking forward, we would like to see more research in this area focusing specifically on the role of organizational support (or barriers) and firm cap- abilities and how their interplay can help firms competing in the marketplace by creating innovative products/services, and associated processes.

Consortium-based approaches are a viable man- ner for scholars to advance their thinking for *practice and knowledge creation, uttered a one.*

We hope the readers will enjoy the reading and gaining insights there in!

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Marketing Innovations Management In The Context Of Integrated Enterprise Development

Dr.Subrat Parida

Abstract: *The main purpose of the research is development of the effective management mechanism of marketing innovations in order to increase the enterprise development effectiveness. For this research, 15 Ukrainian enterprises of light industry, for which a development trajectory was built on the basis of the dynamic integration function, were selected. The article forms the mechanism of marketing innovations effective management. The main trends in the development of marketing innovations in Ukraine emphasized, which confirm the need for development of marketing innovations management in order to strengthen the position of the enterprise and meet the needs of consumers, the conquest of new market segments, increase the level of competitiveness and performance of domestic companies.*

Keywords: competitiveness, efficiency, enterprise management, innovation management, integrated development, marketing innovation

1. INTRODUCTION

The modern state of the global economy is characterized by an increased interest in the innovative goal of development, which is being chosen by the growing number of enterprises. The necessity for this is that, firstly, increase in the level of competition from manufacturers, and secondly, more demanding consumers' attitude to goods. Manufacturers, focusing on the needs of consumers, are trying to offer the market better and improved products with value characteristics, due to the growth of consumer demand from potential customers.

According to American experts, the main reasons for the modern innovative products failure are: biased requirements evaluation for consumers for goods-novelties – about 32%, technological imperfection of goods-novelties – 23%, high level of prices for goods-novelties

– 14%, imperfect sales activity – 13%, delayed start of sales goods-innovations - 10%, the policy of competitors in the market - 8% (Grizovska & Romanova, 2018).

The results of the domestic market research show that about 80% of innovation projects are facing difficulties associated with ineffective marketing strategies for market positioning of the product and sales channels (Danilova & Marchuk, 2019). Thus, most of the mistakes when introducing into the innovative products market are associated with the marketing component or errors in marketing activities. This means that businesses need to pay particular attention to marketing product support for the market or innovations marketing.

2. LITERATURE REVIEW

Innovation discloses the buyer's needs, going beyond the product. Marketing innovations promote the perception of customer value and create new opportunities for unsatisfied consumers, based on which companies can offer innovative products (Aksoy, 2017; Liczmanska-Kopcewicz, 2018).

The concept of marketing innovation, which was characterized as a mechanism of competitive advantage and the key to market survival, is multidimensional and includes a marketing strategy, on the one hand, and marketing indicators, on the other (Muddaha et al., 2018a; Quaye & Mensah, 2019). Such marketing innovation as for example calorie-based packaging or unusual distribution channels can encourage new products appearance. If a company uses a double strategy, simultaneously invests in innovative marketing and research and development (R&D), productivity decreases resulting from their complexity, considering the theory of competencies development and the innovation diffusion (Grimpe et al., 2017; Na et al., 2019).

Market conditions for the competition development encourage improving of the innovative activities performance of the enterprise. Different levels of market competition themselves influence the effectiveness of enterprise innovation. Marketing innovations and various levels of innovation marketing have an impact on the effectiveness of the company's innovative development (Xu, 2019).

Marketing innovations promote the formation of sustainable competitive advantages, setting targets and business activity performance. (Cruz Ros et al., 2017; Muddaha et al., 2018b; Ramirez et al., 2018).

Determining customer needs through relationship managing and their transformation into marketing innovations is the major process of customer value establishment. This encourages improvement of the enterprise's competitive position not only towards the profitability increasing, but also reducing the level of costs, as well as the efficiency of the new technologies introduction (Sánchez-Gutiérrez et al., 2019).

Nowadays, marketing innovations are often associated with the big data analysis (Maøík, 2016). Marketing innovations and their impact on industry 4.0. are vigorously explored in the technical literature. Marketing innovation plays the same essential role as product innovation (Ungerman et al., 2018).

Marketing innovations are implemented in such six spheres: market entry, product promotion or price-setting, product delivery, design of product or packaging, product placement or communication channel, and the provision of services. For example, various applications and social networks usage, or launch of business processes for consumers (Chen & Huang, 2017).

The relationship between the new product and the performance level of the company's functioning significantly increases in high-tech enterprises, as a result of the introduction of marketing innovations. In low-tech enterprises, innovations in business processes directly and positively influence performance. This creates a synergistic effect of marketing innovations, which can be changed considering the innovation level and the specificity of industry factors of the company's activity (Lee et al., 2019).

It is proposed classification of innovations which is widely used in marketing, based on the nature of their influence on the behavior of the social group. He distinguishes three types of innovations: continuous, dynamically continuous, interrupting (Syrotynska, 2014).

Marketing innovations are attributed to the category of organizational and managerial innovations. Marketing innovations include the following components: 1) forms and methods of promoting scientific and technological innovation and the formation of new markets (secondary innovations in the field of marketing, driven by the development of science, engineering and technologies); 2) new ways of stimulating consumer activity (pure organizational and managerial innovations in the field of marketing); 3) combined approaches, containing both of the above areas in the field of marketing innovation (Kiselyov & Degtyaryova, 2014).

The authors related to the study of the marketing innovations features, there is a two-way integrated approach to the study of the functioning and implementation processes. On the one hand, marketing innovation is developed for the consumer (either in order to meet his needs, or for the purpose of organizing marketing support, for example, to attract attention to the product), on the other hand, it acts as a product or technology of innovative marketing for an enterprise engaged in phased commercialization tasks marketing innovations and evaluating the effectiveness of such implementation.

The analysis of publications on the study subject showed that it has not yet received a sufficiently complete scientific understanding of the new theoretical approaches to marketing innovations, as for independent marketing direction, as well as in modern domestic innovation there is no single conceptual approach to the formation of the specific characteristics of marketing innovations and there is no coherent concept for categories and species characteristics of marketing innovations.

2.1. Problem Statement

The commercialization of innovations necessitates the implementation of marketing innovations, therefore issues related to the development of marketing innovations and the creation of mechanisms for their implementation in order to increase the potential and competitiveness of Ukrainian enterprises, become of particular relevance in the current conditions of economic development of the country.

The purpose of the study is to develop a mechanism for effective marketing innovations management in order to increase the effectiveness of enterprise development. Proceeding from the stated goal, it is necessary: to identify the combination of approaches, types and essential content of the definition of "marketing innovation", to distinguish key elements of company marketing innovations management, to study the foreign and domestic experience of introducing marketing innovations and to substantiate the directions of increasing the efficiency of their implementation at domestic enterprises.

3. METHODS AND MATERIALS

For the research, 15 Ukrainian enterprises of light industry, which represent its various sub- sectors from different regions, were selected: "Voronin" Garment factory", "Gloria" Manufacturing and trading company" (Kyiv), "Rosa" Knitting factory (Kyiv), JSC

"Arsaniya", "Manufacturing and commercial firm "Lesia" (Zhytomyr Region), "Volodarka", "Khmilnytsky garment factory "Lileya" (Vinnitsa Region), "Goryn" (Khmelnytsky Region), "Edelvika" (Volyn region), "Kalyna" (Lviv region), "Rivne factory of nonwoven materials"(Rivne region), "Santa Ukraine"(Mykolaiv region), "Cherkasy silk mill" (Cherkasy region), "Chernihiv shoe factory "Bereginia" (Chernihiv region) and "Zoryanka" garment factory" (Kirovograd region)., The development diagnostics was carried out for every enterprise in such spheres as financial and resource provision, marketing, intellectual and innovative potential, economic security, and the level of risks.

Ukrainian enterprises of light industry need to use integrated marketing innovations that create new functionalities, satisfying the requirements of all stakeholders at minimal cost. Considering the fact that the value of light industry enterprises is represented by sales (Q), which are regulated by their marketing discriminants (D), their development trajectory can be depicted as follows: where X – production factors different from the discriminants D (specific production factors of the company).

In the long-term perspective, account for discriminants can be considered proportional to investments in

the enterprise's innovative development. Thus, the growing trajectory of sales volumes for enterprises can be described by such a function of economic growth controlled by In (integrated development):

Considering the global development trends, formula (2) can be shaped in such a way:

Formula (3) was developed for a simple function of enterprise growth (BG - Business Growth), which provides for a special priority in an objective evaluation of the state, perspectivity of performance and development trajectory: where a coefficient indicating the initial state of integration.(4)

Meanwhile, the integration level (Li) provides for constant ls through the regular growth process, particularly the adequacy of the interaction between marketing determinants and companies, demonstrates the asymmetry of the development process. This results in the creation of a new integration of the development as follows:

These results in an increase within the dynamic integration of development (DID) function, that depicts that the level of integration of marketing innovations increases as development continues: where L_{ik} – an ultimate integration, and a_k and b_k – coefficients similar to a and b. Formula (6) demonstrates the regulation of dynamic integration, which results in growth. Dynamic integration can be expressed from formula (5) as follows: Li (In) increases along with the growth rate of Q (In) and its growth, aimed at the innovative development of the company. This means that the DID function depicts the functionality development in the context of integrated functioning, and Li (In) is the value of the integration function of marketing innovations.

Whereas the development potential of the integration functionality can be traced by the ratio of the development state and its upper boundary (ability, capability), the development of the functionality of the DID function can be determined by formula (7) as follows: where ID – Integrated Development.

This equation shows that the integration function of marketing innovations provided by Li (In) induces the development of functional integration, which results in over-functionality based on development asymmetry.

With the understanding that this integration function of marketing innovations can be referred to its suitability to the company's growth, due to its asymmetry development, within the framework of the dynamic integration function (DID), which increases functionality as it grows, rather than basic growth (BG), which decreases functionality.

4. RESULTS

Consequently, innovative marketing tools work at each stage of the life cycle of goods (services) and have their own characteristics based on the stage of the life cycle. It should be noted that marketing innovation can be developed in parallel with technological or product innovation, slightly modifying, supplementing or converting the final product. Marketing innovations can be of a separate nature and act as a separate product offered by the market and developed in accordance with the needs of consumers. Marketing innovation can be used to promote more effectively the existing product or service based on innovative marketing technologies.

The main task ahead of competitive actions in the market is to reduce the period during which the new product is projected. The time of the innovation process of the product-novelty should be as short as possible. We draw attention to the fact that in this classification marketing innovation is also considered in two aspects: as a separate product (when introducing significant changes in packaging, or changes in design); as an innovative marketing technology used in organizing innovation in the market (implementing a

new marketing strategy, using new promotion techniques, using new sales channels, introducing new concept concepts, using new pricing strategies).

Thus, we can distinguish three main approaches to understanding marketing innovations: firstly, marketing innovation is a separate product (product) offered on the market; secondly, marketing innovation is a technology (method) of innovation marketing;

thirdly, marketing innovation is a consequence of the introduction of other types of innovations (technological, product, environmental and other innovations).

According to the results of the conducted researches in order to increase the effectiveness of the development of the enterprise, the mechanism of marketing innovations management (Figure 1) is proposed.

Figure 1 Management of marketing innovations in order to increase the effectiveness of enterprise development *(Developed by authors)*

Implementation of this mechanism of marketing innovation management will contribute to the formation of competitive advantages, value of the company, increase of business value, and increase of efficiency of the integrated development of the enterprise on the basis of the integrated network of innovative business processes in order to optimally combine all marketing measures at the expense of the synergy effect, the beneficiary. Integration of marketing innovations creates the need to create within the organizational structures of the special services management that deal with management in the organization of communications, their planning and control.

Regarding the development of marketing innovations in Ukraine, among the enterprises that introduced only marketing innovations in 2018, the largest number was manufacturing companies - 1334, wholesalers (except wholesale trade in motor vehicles and motorcycles) - 897, and coupled with 200 enterprises of information and telecommunications (Figure 2).

The largest number of enterprises that implemented marketing innovations in 2019 are located in Kyiv (779), and regions of Dnipropetrovsk (275), Lviv (200), Kharkiv (199), Kyiv (182). In this case, the largest number of enterprises - 3860 enterprises, that have introduced marketing innovations are companies with an average number of employees from 10 to 49 people (The official site of the State Statistics Committee of Ukraine, 2020).

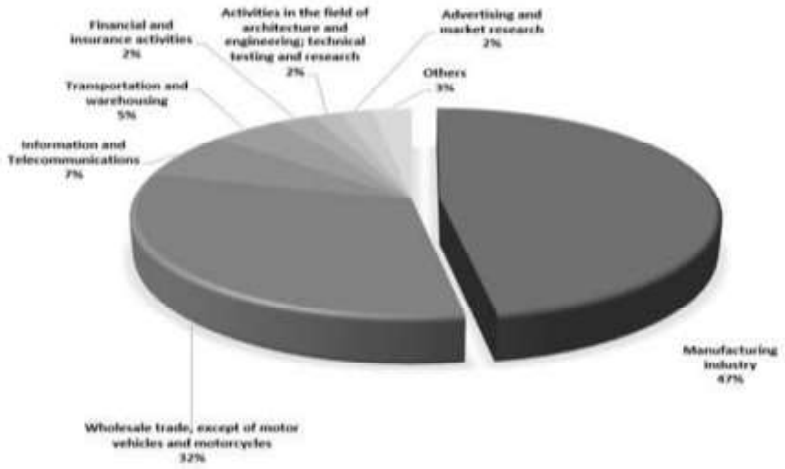

Figure 2 The number of enterprises that introduced marketing innovations (by economic activity) *(Formed by authors on the basis of State Statistics Committee of Ukraine, 2020)*

Fig.3 depicts the dynamics of the enterprises of light industry in 2019 in transforming a decrease in efficiency into over-functionality in order to increase economic value with the aid of integrating marketing innovations and satisfying the interests of business stakeholders.

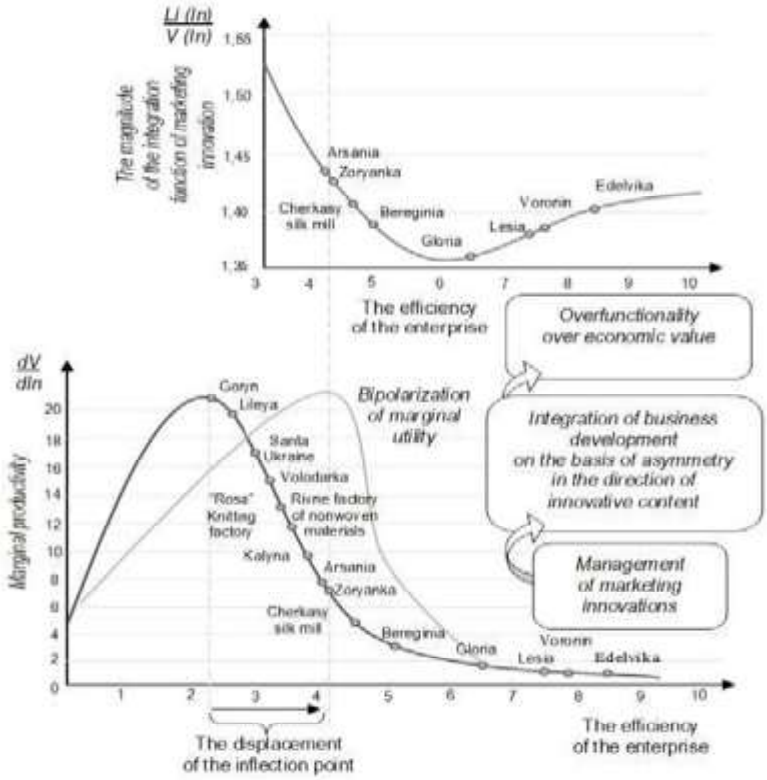

Figure 3 The transformation of the effectiveness of enterprises' marketing innovation in the context of the asymmetry of integrated development, where VQ (In) – the quantitative value in BG (equivalent to Qs (In)), VL (In) – the quantitative value of DID (equivalent to Q (In)), LiL (In) – the dynamic integration of marketing innovations in DID (equivalent to Li (In)) *(Formed by the authors)*

Fig.3 depicts the development trajectory of the 15 Ukrainian light industry companies. This trajectory has moved from BG to DID, therefore intensifying the hidden function of marketing innovations integrating as investments in innovative business development increase. This can be a countermeasure against marginal productivity and a decrease in the effectiveness of information and communication technologies, exceeding a specific level of investment in R&D (level of inflection).

The level of inflection behind the DID function is much higher than behind BG without a self-integration function, with the help of which it can be suggested that light industry enterprises can avoid a decrease in efficiency to some extent by means of trying to increase the self-integration function.

However, there is a certain limit for supporting the increased integration of marketing innovation. Accordingly, excessive dependence on innovative potential (proportional to ICT, R&D, including the bilateral nature of price-setting) requires the effective use of external resources (activity of light industry companies using the interconnected cycle between In and MP, and/or external resources that should not accelerate turnover) to compensate for the decline in performance.

Taking into consideration the decline in marginal productivity, the integration function of marketing innovations is increasing in companies with a high level of information and communication technologies, such as Gloria, Lesya, Voronin and Edelvika, with their high level of integration development function on the whole. Thus, bearing in mind the advantages of stakeholders, these companies are moving to the level of over-functionality and increasing the level of efficiency based on asymmetries in business development.

5. DISCUSSION

The implementation of the mechanism of marketing innovations management promotes the receipt of the following results by the enterprise: expansion of the range of goods, improving the quality of customer service, creating a new positive image of the company, redistribution of the personnel duties and increase of time on consultation of buyers, increase of labor productivity and efficiency of trading space use, increase in sales, income and profits (Syrotynska, 2014).

Enterprises can maintain or improve their competitive advantages on the bases of the integration of certain sources and abilities. The results of our research are also confirmed by the alternative "Resource Capability Vision (RCBV)" structure, which provides strategic marketing direction for small and medium-sized businesses by means of combining innovative marketing practices and dynamic marketing opportunities in order to create a sustainable competitive benefit (Quaye & Mensah, 2019).

Successful implementation of the proposed mechanism requires corporate and strategic conformity, integrated customer-oriented marketing, which significantly encourage innovative marketing in small and medium-sized businesses. In other words, small and medium-sized enterprises can improve their marketing innovations by means of appropriate corporate and strategic decision-making, integrated marketing activity, changing in marketing processes and in analysing of the preferences and tastes of customers (Zakerian et al., 2017)

The integration of cooperation increases the level of companies' innovation and creates significant benefits, including a rise in the number of partnerships that has a positive effect on the performance of marketing innovations in the process of business development (Radicic et al., 2019).

In companies, it is necessary to change not only technology, but also the way of thinking. This is due to pressure on the innovation rate, when the response time to market changes will be completely redefined. The impact of innovation marketing related to Industry 4.0 can be divided into three parts (MPO, 2016), which can be complementary to the proposed mechanism:

First of all, horizontal integration of marketing innovations (value chain) - full computer integration of all marketing directions into the enterprise from placing an order through the supply chain, development and production to shipment and distribution; Secondly, the vertical integration of marketing innovations – from the lowest level of management in real-time through production planning and a marketing system for making effective decisions at the highest level; Thirdly, the integration of product development processes (life cycle of a product) along the entire engineering chain - from research, development, prototyping and production planning to designing and implementation into the process of the entire life cycle of a product.

We cannot agree with the statement that market competition, marketing innovation and innovation efficiency in enterprises have an interaction effect (Xu, 2019), because it is market competition that is the factor in creating marketing innovations, which, resulting in integration, have a greater stimulating influence on innovation efficiency of the enterprises rather than the traditional approach to the functioning and development of the enterprise.

Our research allowed us to highlight the main trends in the development of marketing innovations in Ukraine, backed up by research by other scientists:

- The use of artificial intelligence, which involves replacing the usual messages on the site chat-bots

with an individual personality, specifically, the introduction of online consultants to improve the quality of cooperation with clients. In this case, personalization of messages with the help of Account-Based Marketing (ABM) creates the possibility of forming messages for each consumer personally, taking into account his interests.

- The use of blockchain platforms, which creates advertising opportunities on sites that do not pose a threat and danger to the potential consumer (Varelas et al., 2019).
- Integration of marketing innovations into the consumer lifecycle, whose key task is to formulate a managed contact or communication strategy through personalized appeals and retargeting to support existing and potential customers (Sánchez-Gutiérrez et al., 2019).
- Formation of a communication messenger channel, through which an entrepreneur can study his target audience (Xu, 2019).
- Formation of marketing content augmented reality (AR). Domestic marketing begins to work with sponsored and branded AR content.
- Use of predictive analytics. For example, using a tool like Infer, becomes possible to "crawl" web pages with only an e-mail address and to determine the consumer's willingness to buy.
- Intensify the use of BigData to identify consumer desires and needs.

Crisis phenomena in Ukraine have affected the functioning of enterprises of all spheres of activity, most of which are forced to reduce marketing budgets, save on marketing activities, which leads to a drop in their marketing activity, resulting in slower sales, lowering financial and economic performance and efficiency. As a result, there are threats to reduce competitiveness, loss of a certain market share and even - loss of business. It is therefore advisable to intensify the search for marketing innovations, especially those that do not require significant financing. Such opportunities provide the development of information and communication technologies, in the area of which are finding innovative solutions in the field

of Internet marketing. In general, marketing innovations are closely linked, intertwined and synergistically interact with product, process and organizational innovations.

Nowadays, when domestic manufacturers enter into a struggle for consumers with each other, the winner will be the one who builds his activity mainly on the basis of an innovative approach and the main goal of the strategic plan is marketing innovation.

2. CONCLUSIONS

Marketing innovation can be seen as a product, technologies, a consequence of other innovations. The conducted researches made it possible to consider marketing innovation as a process that integrates the interactions of the subjects of the marketing system in the innovative functioning with various means of marketing communications.

The developed mechanism of marketing innovations management creates opportunities for formation of competitive advantages of domestic companies, increase of their value, increase of business cost and increase of efficiency of enterprise integrated development.

The most relevant implementation of marketing innovations today was in the enterprises of manufacturing, wholesale trade, information and telecommunications. Marketing innovations have become most widespread in Kyiv and regions of Dnipropetrovsk, Lviv, Kharkiv and Kyiv. The function of marketing innovations integrating is increasing in companies with a high level of information and communication technologies, such as Gloria, Lesya, Voronin and Edelvika, with their high level of integrated development function in general based on the decrease in marginal productivity. Therefore, these companies are moving to the level of over-functionality, considering the benefits of stakeholders.

The main trends of the development of marketing innovations in Ukraine are highlighted, in particular, the use of artificial intelligence for forming messages to the consumer taking into account his interests, blockchain platforms, predictive analytics, BigData in order to determine the desires and needs of consumers, the integration of marketing innovations in life form, augmented reality communication and content marketing channel, drone implementation.

Under the conditions of correct and effective implementation, marketing innovations can strengthen the position of the company and to a greater extent contribute to meeting the needs of consumers, the conquest of new market segments, increasing the competitiveness of the enterprise, improving its image, obtaining better results and ensuring higher efficiency. Thus, in general, marketing innovations are qualitatively new solutions at the strategic and / or operational level of marketing as a functional subsystem of business, which are a prerequisite for the effective development of the enterprise.

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Innovation by developing human resources, ensuring the competitiveness and success of the organization

Kalyani Senapati

Abstract In today's highly dynamic and competitive business environment, firms are exposed to strict challenges with meeting the ever- increasing market and customer needs and expectations. In order to ensure the competiveness and success of the organization managers need to accept innovation as a key element for the organization. However a major driver for innovation is HR and for innovation to be successful managers needs to support, plan for and nurture an innovation culture. Based on these aspects the authors of this paper propose a framework for HR development for innovation, to reach the actual performance of an organization. The purpose of this framework is to offer, to all managers, a clear picture of existing HR capacity to innovate and possibilities to develop this capacity in order to improve the organization's capacity for innovation, thus increasing their chances of success in today's highly dynamic and competitive business environment.

1. Introduction

The world has changed dramatically during the last 20 years, and the dawn of a new form of civilization has emerged as the new millennium begins. In this age of rapid, unexpected, and unpredictable changes with far reaching consequences, the role of governments, citizens, organized groups, nation-states, and societies is changing rapidly as well. Public and private organizations, and management systems, are being transformed by either choice or pressure and necessity of adaptation for survival (Farazmand, 2004; Anastasiu, 2012; Kesti, 2012; Silva, 1997).

To meet the challenges of globalization and to ride the rapid ''waves of change'', the future managers — both generalists and human resource specialists —have no choice but are effective human resource managers with high qualities. They must be intelligent, knowledgeable, skilled in human resources management and organizational behavior, able and willing to learn and lead learning organizations, and capable to create human capital and work with people on an equal basis, not as authoritative leaders over them (Farazmand, 2004; Anastasiu, 2009).

Innovations in human resource development

Human resources development is the process of increasing the knowledge, the skills, and the capacities of all the people in a society. In economic terms, it could be described as the accumulation of human capital and its effective investment in the development of an economy (Silva, 1997). HR plays a significant role in fostering innovation. It's no secret that business success today revolves largely around people, not capital (Joseph, 2012).

Innovation is important in two key ways for organizations, playing a role in both radical developments and in smaller continuous changes. As organizations seek to become more innovative, so the behaviours of their employees' would also have to change (Searle, 2012).

For innovation to take place, firms may leverage human capital to develop organizational expertise for creating new products and service (Chen, 2009). There is no limit to the areas of innovation in human

resources development and management. These areas may be grouped into three categories (Farazmand, 2004):

In the first category of human resource management for innovation enter all the elements of constant searching for the needed personnel, for the right person, position of for searching the right person for the right position or job. This is a challenging job that can and should be accomplished through careful planning, recruitment, education, and training all the time. This includes the challenge of recruiting, educating, and training the highly competent managerial and leadership personnel for strategic and operational levels. These are the people whose knowledge and skills are indispensable for leading and managing large and complex organizations in all sectors.

Second, technological innovation is central to strategic human resources development and capacity building, but it can only be made possible through the availability of necessary financial resources that finance and support it. Without necessary financial support, innovations can and do occur but may not reach the developmental stage.

The third category of innovations in strategic human resources development and management is directly related to the first two, and all three complement each other.

2. The proposed framework for HR development for innovation

Economic environment is changing rapidly and this change is characterised by such phenomena as the globalization, changing customer and investor demands, ever-increasing product-market competition. The people who make up an organization – human resources – are considered to be one of the most important resources of today's firms. People and how they are managed are becoming more important because many other sources of competitive success are less powerful than they used to. Recognizing that the basis for competitive advantage has changed is essential to develop a different frame of reference for considering issues of human resource management and strategy (Çali'kan, 2010).

The knowledge embedded in human capital enables firms to enhance distinctive competencies and discover innovation opportunities. When firms develop new products and improve management processes, they require the motivation and ability of human capital to produce creative ideas, develop innovative approaches, and exert new opportunities. Human resource management function can influence and modify the attitudes, capacities, and behaviours of employees to achieve organizational goals and it plays a crucial role in nurturing the necessary conditions for catalyzing and channelling individuals towards the development of innovation activities (Chen, 2009).

When firms use creative capabilities and innovative characteristics as hiring and selection criteria, their employees are likely to spawn diversity of ideas and commit to more innovation behaviours. Through effective staffing, employees become important sources of new ideas in the firm's innovative process. A high level of participation would create the conditions to encourage employees to bring new ideas and exchange knowledge in the ongoing innovation process and, in turn, enhance innovative outcomes (Chen, 2009).

To reach the actual performance of an organization the authors of this paper propose a framework for HR development for innovation (see Figure 2), to reach the actual performance of an organization. The purpose of this framework is to offer, to all managers, a clear picture of existing HR capacity to innovate and

possibilities to develop this capacity in order to improve the organization's capacity for innovation, thus increasing their chances of success in today's highly dynamic and competitive business environment.

Innovating trough development of human resources starts in the selecting phase of human resources, where identifying the peoples with great innovation capabilities is require. It is important in an organization to have people who can "think outside the box" so the organization can benefit from innovation. In order to recruit people for innovation it is necessary to see if they are inquisitive, if they are locked into one viewpoint or willing to consider others, if they are open to new ideas, new concepts, knowing this can help also in planning how their skills are improvement. The hunger to always learn, the opening and thinking about things in different way, need to be present at innovative people.

For innovation to be successful managers needs to support, plan and nurture a innovation culture. The ability to help create, protect and build the organizational culture is a critical role for HR to play. The most powerful force in business is culture. While corporate culture is not necessarily the responsibility of HR leaders, the people who are hired and the training and cultural imperatives placed on the business are done so through the role of HR, so HR leaders can have a big impact on whether or not the organization is culturally attuned to innovation. Creating an innovative culture is a very complex process that needs to be implemented from the top level to the base level of organizations. The process of creating an innovative culture will not be detailed in this article.

Another important aspect in development of HR for innovation is the reward system. The right rewards system provides a powerful force for reinforcing commitment, directing employee professional growth, and shaping the corporate culture to be more innovative. HR departments must look at the reward mechanisms in place and ask if they are doing the right things to develop the employees and culture of the organization. This should include: compensation strategies, performance management tools, and other targeted recognition and reward programs.

A key element for organizations in successful of innovation, trough HR development, lies in how the learning system is created. Managers should ask, "what the employees need to do for the business to get what it needs", and then help employees to achieve those behaviours. This could mean options to increasing self awareness, for a deeper understanding of the context, for appreciating the linkages between their own new behaviour, business outcomes and personal implications, picking up a few skills to achieve this behaviour change, using support systems like peer coaching, mentoring, etc. The purpose is set and so is the destination, they will create the path for themselves. They will create the path of learning that drives sustainable positive changes in behaviour (Searle, 2012).

One way for organizations to become more innovative lays in their ability to foster, develop and utilize the talents, in particular the innovative potential, of their employees (Searle, 2012).

Merit system should awards meritorious performance and it is merit that can serve as a powerful motivator to keep and promote talented people in organizations. One of the big problems with the management of contemporary organizations is, and has always been, that they spend so much time, energy, and money to recruit and hire talented people, and even train them to the details, only to ''lose them easily with mismanagement and carelessness.'' This is a problem that most organizations around the world practice: Attract the best and lose them to others or turn them into apathetic and unproductive people. This is a fundamental mistake, even a managerial stupidity. It is true that not everyone can be retained but retaining,

motivating, and promoting talented people in organizations is a challenge that is often ignored or overlooked, because managers very often ''take for granted'' their most valuable people (Farazmand, 2004).

3. Conclusion

The importance of innovation in today's business is widely recognized by all managers. At HR level they talk about innovations; they support innovations, but they usually kill innovations offered by employees and managers. HR always sees issues arising from the company-wide implementation of the new procedure or process.

Innovation and human resources management play an increasingly important role in sustaining "leading edge" competitiveness for organizations in times of rapid change and increased competition. "Discontinuous change requires discontinuous thinking. If the new way of things is going to be different from the old, not just an improvement on it, then we need to look at everything in a new way It is important to recognize why success through human resources can be sustained and cannot readily be imitated by competitors. The reason is that the success that comes from managing people effectively is often not as visible or transparent as to its source.

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Organizational Innovation And The Role Of Human Resource Management: Assessment Of The Literature

Mr.Bipul Kumar

ABSTRACT: The aim of this paper is to investigate the extent to which organizational innovation and human resource management are related; the state of human resource management and innovation in Africa particularly in Nigeria; how effective human resource management can enhance innovation in the organization. Its key focus is to explore the extant literatures that analyses the possible relationship between human resource management and innovation in the organization and particularly to identify the key human resource management practices and how they can enhance innovation in the organization. This paper build a number of research questions particularly in the area of the awareness of organizational innovation by human resource practitioners in Nigeria, few findings were nib in the bud from the existing literatures as well as the practical experience which will serve as the basis for future research. This paper establishes how some selected human resource function such as recruitment and selection, compensation, training and development and good industrial relations can be a source of creativity, change and innovation in the organization. Also, the almost non-existence of innovative strategy by human resource personnel to achieve the mission of the organization is also looked into. In addition, recruitment and selection; and training and development has been proven to be the basis of innovation in the organization, new ideas need to be developed or adopted in these area, especially in Africa.

KEYWORDS: Human Resource Management, Innovation, Recruitment, Selection; Training & Development

INTRODUCTION

In any circumstance or situation, changes that create a new dimension of performance are referred to as "Innovation". In today's globally competitive business environment innovation has been the key driver in the achievement of optimum performance in the organisation. Introducing innovations (changes) into the organisation is one of the great challenges leaders face in most countries of the world. Innovation to a greater extent is a function of leadership and other factors. Many people prefer to do things in their usual ways; this will not only result to monotony but deter changes.

The world itself is changing every second how much more organisations which happen to be micro-subset of what the world entails. Thinking of new ways to do things in the organisation becomes imperative at this point, if an organisation success is not a mere wishful thinking. Being open to innovation ideas, approach is necessary if we are to succeed personally and professionally in today's fast changing world.

In every organisation, the greatest asset we can talk about is the human resource, defined to harness other resources to achieve goals and objectives. As noted in Margret J. Wheatley work, she noted that human creativity and commitment are our greatest resources, and that where there is true diversity of opinion,

there will be innovation. The above statement suggests that since creativity and commitment is a product of human which is the greatest resource we can ever talk about when we bring people together to work for an organisation, and as a leader you allow diverse opinion which is a function of how you manage them, creating an innovating environment after all. Managing people in the organisation is the responsibility of line managers especially the human resource managers. Thus, leading people for innovation and creation of an innovative environment in the organisation is also a function to be performed by HR managers.

Globally, Innovation has become a debate at both academia and organizational level. Economic growth and global competitiveness are increasingly driven by knowledge (Salmi, 2009). In recognition of the importance of innovation, organizations and government of developed, emerging and even developing countries have begun to create offices for Science, Technology and Innovation. According to the British minister for Science and Innovation, ''Successful explanation of new ideas from science, technology and emerging management practices has crucial role in raising productivity'' (UKSPA, 2003).

Maintaining an environment that will encourage and promote innovation in terms of organisation policy and practice is HR related issues, such as learning and development, the well-being of employees, recruitment process and compensation, management identifying past practice and turns it around to build a culture for innovation. Innovation is about clarity in the sense of direction, knowing the type of innovation that is suitable to achieve your organisation objectives.

The world is presently relied on a knowledge-based economy driven by innovation. The Organization for Economic Co-operation and Development (OECD) manual states that, innovation has been seen to play a central role in the knowledge based economy, but until recently, the complex processes of innovation have been insufficiently understood (OECD, 1992). At the macro-level, there is a sustained body of evidence that innovation is the dominant factor in national economic growth and international patterns of trade, (evidence from China, Malaysia, Japan India, Singapore, Spain etc). At the micro-level, within firm/ organisation, R&D is seen as enhancing a firm's capacity to absorb and make use of new knowledge of all kinds, not just technological knowledge (OECD, 1992).

In real sense, innovation is embedded in all kind of discipline (science, social science, engineering, human resource management, etc.). In a recent Green paper by European Commission, organisations that are innovative in nature share two major characteristics of skills, strategic and organisational skill. Strategic skills connote long term view, ability to identify and even anticipate market trends, willingness and ability to collect, process and assimilate technological and economic information while organisational skill has to do with taste for and mastery of risk, internal co-operation between the various operational departments, and external co-operation with public research, consultancies, customers and supplier, involvement of the whole of the firm in the process of change and investment in human resources.

Because innovation is ubiquitous within and among the organization value chain, and Human Resource Management (HRM) goal is to efficiently utilize people in the organization through various HR practices, it is not out of context to assert that the innovation capacity of any organization is largely depends on HR programmes and practices in such organization. Human resources (HR) are considered by many to be the most important asset of an organisation, yet very few employers are able to harness the full potential from their employees. Lado and Wilson (1994) define a human resource system as a set of distinct but interrelated activities, functions, and processes that are directed at attracting, developing, and maintaining a firm's

human resources. Innovative organization continually seeks to manage their HR effectively to create and market new product and services (Gupta and Singhal. 1993).

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21st century organizations (e.g. Microsoft, Apple, Samsung, Warby Parker, Alibaba, etc) that have adopted innovation as a way of conducting their business for sustained competition, cherished creative people and as such they remain relevant within their industry. When organization involve in innovation, they need creative and innovative people, who are flexible, risk taker, and tolerance to uncertainty and ambiguity (Chen and Huang, 2007). Because HRM manages people who are undoubtedly believed to be the source of creativity and innovation – it is important for organizations to adopt supportive HRM practices that can motivate and encourage employees to be creative and innovative (Ling and Nasurdin, 2013). The tasks for HR managers in today's organizations are:

- How innovation can be introduced to the way we manage people in the organisation,
- How to bridge the widen gap between innovation and HRM and
- How can HR manager be innovative as an agent of valued added to the organisation.

Research has confirmed that the HR of any organisation is the lubricant as well as the hub, also, no organization has that tendency of being a global competitor without innovation, the first point of cut in the organisation is the personnel/HR which need special attention in terms of been innovative.

Although, many organisation in the developing world allay the fear of innovation in the organisation may cause major challenge especially cutting down the size of the labour.The field of HR needs to be innovative the more to be able to stand the test of time like other field of study.

As many as in the field of HRM who are willing to adopt new ideas and a new ways of approaching issue in people's management, there is a great confusion on what to innovate, how the new ideas will be conceived. This challenge is inevitable and need practitioner arrest. In actual fact, in developing countries like Nigeria, there are minimal introduction of innovation into the way people are managed through various labour reforms and other reforms in the public service, but the truth is that most of these reforms are still traditional in nature.

The good news is that, Downs and Mohr (1976) in their attempt to correct the instability in the innovation model. They adopted the unitary approach to developing innovation theory and that all innovations regardless of type i.e. (semi- conductor application biotechnology application, administrative application etc.). The implication of the above according to them is, innovations are considered as equal and subjected to the same theory. Of course, we are talking about new ideas, the component may be different but the process is the same.

The ability of an organisation to innovate is a pre-condition for the successful utilisation of inventive resources and new technology (Alice Lam, 2004). The introduction of new technology often presents complex opportunities and challenges for organisation, leading to change in managerial practices and the emergence of new organisational forms. Research output in innovation proved that organisational technological innovations are intertwined. Practitioners usually referred to the work of Schumpeter which "saw organisational changes, alongside new products and process as well as new markets as factors of creative

destruction (Schumpeter, 1950).

In a general sense, the term organisational innovation refers to the creation or adoption of an idea or behaviour new to the organisation (Daft 1978; Damapour and Evan 1984). In reality, the existing literature on organisational innovation in indeed very diverse and not well integrated. One of the theories of organisational innovation that is useful in this content is the theory of organisational recognition and learning, the theory focus on the micro-level process of how organisations develop new ideas for problem solving. The theory emphasised the cognitive foundations of organisational innovation which is seen to relate to the learning and organisational knowledge creation process (Agyris and Schon 1978; Nonaka 1994; Nonaka and Takeuchi 1995). One of the major challenges in this regard is the ability of the organisation to understand its capacity to create and exploit new knowledge. Innovation in any organisation is a function of readiness and willingness to adapt to radical changes or environmental shift. The overlap of major empirical research outcomes and theories of innovation has prevented the development of a clear view of "organisation Innovation" (Alice Lam, 2004).

Conventional research on organisational innovation has explored the determinant of an organisation's propensity to innovate. Individual influence, organisational and environmental variables and organisational structure also play an important role in the process of innovation. Several studies have shown how certain organisation structures facilitate the creation of new products and process, relationships and boundaries (Peltigrew and Fenton, 2000). In this vein, David Guest in his six model of HRM mention innovation as one of important issue that come up under HRM strategy.

Innovation is at the hearth of organisation success because it allows them to improve the quality of products, increase efficiency, cut costs, meet the changing needs of customers, increase sales and profit, gain a greater market share and differentiate themselves from competition. Undoubtedly, human resource practice (HR practices) are the primary means by which organisation can influence and shape the skills, attitudes and behaviour of individuals to do their work and thus achieve organisational goals.

This study examines generally the linkage between HRM and innovation in the organisation, how HR practices can stimulate innovation and HRM in developing countries (i.e. Nigeria). Considering West and Farr's, (1990) definition of innovation. They perceived innovation as the intentional introduction and application with a role, group or organisation of ideas, processes, products, or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organisation and the wider society. This definition provides a broader scope for innovation and also suggests that innovation has the potential to occur at every level and in any part of organisation. Innovation can occur in any part or whole organisation, the process is the same while the component might varies. Since all innovations ideally suppose to pass through four sub-process of problem identification, idea generation, idea evaluation and implementation of innovation. There is the need for HRM practitioners to pick up the core HR function and practice, brainstorm following the innovation process. This is important because evidence from developing countries like Nigeria shows that most of the existing strategy to measure performance are not working particularly in the public sector and this has hampered the relevance of HR managers in most organisations.

Indeed, the outcome of a well conceived innovation and process when completed will lead to training and development that will promote new ideas and profitability. The successful implementation of innovations depends largely on organisation leadership and the climate in and around the organization. A climate

characterised by procedures, systems and norms that encourage risk-taking behaviours, experimenting, cooperation, and tolerance for ambiguity and unpredictability will increase the likelihood that all phases of innovation process will be realised (Tesluk, Farr, and Khein, 1997). The innovation process may only result to a mere dream, if there is no support from the management, organisational support becomes most important in the evaluation and implementation of innovation.

On the part of HR practitioners, one of the major areas that need attention to contribute to organisation innovativeness is to design or come up with theories or model of work group that is capable of enhancing cooperative, and collaborative, openness and activeness of numbers of groups in the organisation. This is important because earlier study by

Hunter noted that, creativity and innovation at the workgroup level depend on active, open, and collaborative exchanges and cooperation among group members, but such cooperative exchanges are often not part of the typical behaviour pattern of autonomous, competitive people who are focused on individual achievement. The management takes it all syndrome is also one of the problems causing lack of innovativeness of some organisations and this is killing productivity and innovativeness in the organisation.

Since one of the major functions of HRM is compensation and reward, it now becomes unavoidable for HR managers to develop flexible reward and compensation policy that will promote creativity and innovation, individual or leader of team must not be the only subject of recognition rather every member of such team should be rewarded. This will shift the focus of every member of group to contribute new thing to the group and thereby promote innovativeness.

Unfortunately, in most developing countries like Nigeria, innovation in HRM is nothing but near zero. Research has proved it in many ways that human resource is the only mover of other resources in the organisation, so it is the function of HR practitioners to ensure that people who are to be employed are full of ideas and concerted effort must be made on how to train people to think creatively. To this end, the vocal point here is for the HR managers to consciously recruit creative mind for organisation and monitor each of the department on their intensity of innovation. Three crucial areas need attention if HR practitioners want to remain relevant in today's organisation. The recruitment process must be in line with organisational goal which must promote creativity, there is also the need for specialised training to enhance productivity.

No matter how promising a policy look like, the management must belief and show interest in the implementation. This is where the HR managers need to come on board to sensitise the chief executive and management on the need to train people to be creative and innovative. Innovation activities are very important for organisation and that human resource policies must support innovation activities (Seale and Ball, 2003:4). This suggests that no matter the nature and size of organisation, introduction of innovation must be connected with HR practice and function.

Ordinarily, a well conceived management process and practice that guaranteed conducive working environment coupled with a sound knowledge management system generate motivation and in turn nourishes or enhances employee's creative mind. Transformation of knowledge, skills and expertise into new thoughts and ideas is what innovation symbolises. These knowledge, skills and expertise are part of human being

which by function is to be managed by HR managers to achieve the organisational goals. HR practices are primary approach to elicit and reinforce employee's knowledge and expertise that firm regards (Martinson 1995, Youndt et al 1996; Collins and Clark, 2003). The truth as of today is that effective management of employee's knowledge will no doubt promote the innovativeness of organisation.

Organisational innovation entails the development of new product or services as well as new administrative system are emerging as an important source of sustainable competitive advantage (Damanpour, 1991, Harley and Hult, 1998). The innovation process involves the acquisition (recruitment) dissemination, and use of new and existing knowledge (Damanpour, 1991, Mooman and Miner, 1998). The above is closely related to HR function which corroborates the undeniable role HRM would play in organisational innovation. Organisation innovativeness is closely tied to its ability to utilise its knowledge resources (subramaniam and Youndt, 2005).

As noted in the SHRM School, the integration of organisational strategies and HR enhances performance. Establishing how or the role of HRM in innovation in the organisation, the starting point is for management to involve the in the design of innovative activities. This will allow the HR managers to be aware of certain skills and capabilities to hunt for in the hiring process. The vision and mission of organisation in long-term will determine the types of people the organisation will employ. That is why it is necessary when organisation is recruiting, there is need to furnish the HR or recruiting agent the short and long term goal of the organisation in terms of the new things the organisation intend to achieve with time line. This will enhance and guide the selection process and bring about new engine of thinking faculty into the organization and thereby ignite innovation.

On this note, it is now important for HR managers to shift attention from recruiting to meet immediate need of the organisation to selective recruitment with bias for creative skills for them to play their value added role accordingly and in turn enhance the innovation capability of organisation. This is possible through a three-way dimension driver for innovation in the organisation, selectivity in hiring, selection for expertise and skill and selection for future potential. For HRM to play its role in organisational innovation, all the HR function need to be readdress particularly new approach be adopted. For example, as noted by Chung-Jen and Jing-Wen (2007), the era of HR practitioners designing training that focus on general performance is over.

The biggest quest in the world in recent time vision 20-20-20 is innovation, and no nation can achieve thevision without given greater emphasis to the retraining and skills upgrading of the workforce in both public and private sector. On the part of the government in this direction, more attention should be given to merit and not patronage system to raise the status of the public servant for creativity.

Innovation is the life-blood of any business organisation, business organisations need innovation to create, as well as maintain their competitive advantage. Organisation which tries to stand still will not survive. To survive in the current competitive global business environment, organisations need a regular stream of innovation to succeed. (Hellriegel, 2001; Simon 1997; Drucker, 1985; and Porter, 1980).

As the first point of call to new employee and the source of development for the existing employees in the organisation, human resource has been recognised as one of the contributing factors for economic growth and for social, political and technological development as well as newly emerging industrialized and fast

growing economy in some sectors (i.e. telecommunication, energy and hospitality) which Nigeria happens to be one. The human resource development (innovation) is found to be important agents in business for economic growth and sustainable development in the competitive environment of the emerging economy.

The fascinating thing is that, past conceptual and empirical works generally agreed on the importance of certain human resource practice in the determination of employee and organisational performance irrespective of size, sector and external environment (Harel and Tzafrir, 1999). Considering the universalistic approach on the "best practice", past studies posited that some human resource practices are always better than others and at the same time, recommended that all organisations should adopt these best practices. The proponents of the universalistic approach believed that greater use of the best human resource practice will help organisation to increase their effectiveness (osterman, 1994; Pfeffer, 1994; Delery and Doty, 1996). Similarly, a number of studies have successfully identified six critical and essential human resource management practices as been crucial to organisation effectiveness (Osterman, 1994, Pfeffer, 1994; Delery and Doty, 1996 and Harel and Tzafrirm, 1999). These six practices include recruitment, selection, compensation, employee participation, training and performance appraisal. Having identified these six practices as essential, there is urgent need for practitioners in the field of HRM to address and be innovative on how to perform those functions.

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In addition, several studies have also confirmed that human resource practice is one of the most important factors that shape and influence the level of innovation in the organisation; others are organisation structure and organisational culture (Martins and Terblanche, 2003; Movondo and Farrel, 2003; Robins and Coulter, 1999; Roffe, 1999; Michie 1979). In a related studies by Galia and Legros (2003), Roffe (1999), Michie and Sheedian (1999) and Holbrook and Hughes (2003) suggested that good human resource practices have significance impact on the innovation performance of organisations. Their findings show that organisation that focuses on human resource practices such as training and development, sharing skills, extensive recruitment and selection, employment security, incentive reward systems and innovative work practice produce not only the highest level of productivity but also enhanced their innovative activities. In all, recruitment and selection process that guarantee creative employees, training for creative skills and idea generation with new way of handling human resource is one of the areas that human resource management can contribute to organisational innovation.

Innovation is inevitable in today's organisations it is desirable for global competitiveness. Johannessen et. al (2001) refer to innovation as newness and used six different types of innovation activity to measure innovation, the six areas of innovation activities are new products, new sources of supply and new way of organising (which is synonymous to human resource management innovation). It quite unfortunate that in Africa, very few organisations and countries pay attention to full development of human resource in terms of their contribution to either organisational performance or national development and this is responsible for the underdeveloped nature of the organisations. Innovation is the heart of organisation's success because it allows them to improve the quality of products, increase efficiency, cut costs, meet the changing needs of customers, increase sales and profit, gain a greater market share and differentiate themselves from competitors (Nooshin and Hamid, 2011). Innovation initiative tends to depend heartily on employee's

knowledge expertise and commitment as key input in the value creation process. The point here is how the HR practitioners will design models and approach to recognise this value creation ability in employees. Value creation brings about idea generation which leads to thought and later turn to innovation.

Amazingly, most innovative organisation of the world today have long realised the carefulness analysis of personnel needs and hire creative people to fulfil organisational goals, they put in place adequate performance systems. They implement reward systems to recognise and boost employee creativity. To foster innovation in the organisation, human resource planners should consciously recruit people with a variety of professional skills in line with the vision of organisation.

A good reward system which is a function of human resource manager must embrace innovation all over the world; this has been tested by many organisations like Motorola, Hewlett-Packard, etc. Reward such as freedom for creativity, Bootlegging, fellowship, in-house grants and autonomy should be encouraged by organisation to promote innovation. There should also be an open debate on "Dual track Career system" where employees on different professional line enjoy the same benefit; this will ignite the power of thinking for new ideas.

The purpose of this paper is to establish clearly the relationship and particularly the link between HRM, its process and practices and innovation both on the performance of the organisation as well as the role of HR managers in building an innovative organisation. Also, to establish almost non in-existence of the innovative role HR managers should perform in most developing countries taking Nigeria as a vocal point.

On the basis of the above, this paper tends to provide explanation to the following research questions; Did any link exist between human resource function and practice and innovation in the organization; which of the HR function can possibly drive innovation in the organization; what role(s) did recruitment and selection play in organizational innovation; and how did training and development relate to innovation in the organization; how did HR practitioners and managers in Nigeria view innovation as part of their role and the state of innovation in human resource management in Africa.

REVIEW OF THE LITERATURE

Innovation is generally considered to be introducing or improving product, processes, defining or re-defining market positioning or altering the dominant paradigm for the firm (Tidd, Bessant, and Pavitt, 2005). In achieving innovation either product or process innovation, the human factors within the organization is critical. The innovation process and its steps in it is never enough without people, it is the people plus other resources that will drive and make innovation happen.

Over the two decades, the likes of Kozlowski and Roberts (see Kozlowski,1987 and Roberts 1988) has called for human resource management to be more distinctly embedded in organizational strategy in other to facilitate innovation. The call was not given priority until the more recent attempt to investigate the possible link between human resource management, its practice and innovation in the organization.

Many authors and researchers has worked and acknowledged the role of human resource in innovation but specifically not attempting to focus researches on how specific function of human resource management contribute to building innovation capacity. It is observed that innovation is a necessary pre-condition for change in the organization which is anchored by the human resource management process and practice (recruitment and selection, training, etc.) W.M Adegbite (2011). Innovation when introduced to any

organization through an embedded HR process will become a natural process. The major issue in this context is for HR practitioners in Africa (Nigeria) and sub-Sahara to single out the major Human resource management function and initiate major innovation to bring a total turn around in the organization considering the peculiarity of African business environment.

Obviously, research and knowledge in the area of organizational innovation and human resource management is generally limited and almost not available in Africa, few countries like Egypt, Tunisia, and South-Africa are striving to strengthen their HR capability.

As noted by Freel,(2005); Narveka and Jain, (2006) in Karen Becker and Judy Mathew (2008), that smaller number of researchers have focused on the contribution of specific function of human resource management to building innovation capacity. Research conducted by Shipton, Fay, West, Patterson and Birdi,(2005) highlights the contribution of effective human resource management practices to innovation success. Shipton et al (2006) examine the use of human resource management at two stages of a creative idea which is peculiar in a way to recruitment and selection and some type of training, while the second one is its implementation. This research specifically shows that training, appraisal and induction; and a focus on explanatory learning can make the difference between organization in terms of product and technological innovation. They concluded that, organization that has human resource system that emphasises these practice are going to experience innovation.

Also studies have shown that some HR functions such as HR planning, attraction and selection, performance management, recognition and reward system; and learning and development are innovation facilitators in the organization.

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Appropriate approach to the list of the aforementioned HR functions will reinforce an organization culture that will support and facilitate innovation.

Most research in Africa did not focus on how to innovate the organization through HR function. Organization in Africa (most especially the indigenous one's in Nigeria) does not pay attention to innovation either in the context of human resource management or the organization. The few innovative organizations are multi-nationals.

CONCLUSIONS

Studies related to the relationships between human resource management and innovation in the organization has grown in the last decade as organization seek ways to sustain innovation across a range of products, processes and services.The major benefits from detailed research across a number of firms may lead to identification of a range of HRM practices and particular combinations of HRM practices for firms' innovation performance at different stages of their lifecycles or growth (Karen Becker and Judy Matthews, 2008).

Findings from the literature review indicate that no single HRM approach may be sufficient to promote innovation but rather bundles of strategies and these bundles need to be studied empirically. The intention of this paper is to contribute to the management of an organization's intellectual capital and maximise innovative performance with appropriate HRM systems and practices, particularly in Africa.

This research work shows that innovation in the organization through the effort of human resource

management is almost non-existence in African especially in Nigeria. It is observed that human resource managers are more traditional in their approach in managing people in the organization. Obviously, research and knowledge in the area of organizational innovation and human resource management is generally limited and almost not available in Africa, few countries like Egypt, Tunisia, and South-Africa are striving to strengthen their HR capability.

Also studies have shown that some HR functions such as HR planning, attraction and selection, performance management, recognition and reward system; and learning and development are innovation facilitators in the organization. Appropriate approach to the list of the aforementioned HR functions will reinforce an organization culture that will support and facilitate innovation.

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