

Managerial Innovation: An Attempt to Interpretation and Evaluation

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Abstract. *This study is to explore the relationship between technological innovation and managerial innovation. The great emphasis has been on technological innovation, with neglect of managerial innovation, which has had major contributions to improving technology management and increasing the availability of companies through the three main forms of managerial innovation: general managerial Innovation, the innovation of managerial concepts and Re-innovation of the company. In the post-industrial age, innovation has reached its peak in the creation of the Internet and its integrated technologies and applications. Management innovation has reached its peak in the innovation of knowledge management and the productivity of knowledge work.*

Keywords: Technology innovation, Managerial innovation, Knowledge management, Knowledge, and Work productivity.

JEL Code: O30, O31, O32

1. Introduction

Innovation is the only concept that has not been obsolete and will not be obsolete. This is because it represents a constant and continuous focus on finding what is new, whether in the new idea, the new product (or the new service) and finally in the new market. If specialization in a given field (i.e., having a field of experience of rules and procedures) represents the past, innovation is the future that develops the specialization in new concepts, tools, and applications. This applies to management as a system governed by principles and theories. Management innovation is what provides management with all that is new in improving the effectiveness of achieving the objectives and the efficiency of means.

Although managerial innovation has been an essential part of the innovation movement since ancient times, it has only received secondary attention compared to technological innovation. Perhaps this explains many things. For example, the Egyptian pyramids considered an exciting technical achievement represented in the transfer of large stones weighing 2.5 tons to long distances and then raised them at high altitudes during the era in which they were built. But the managerial achievement in the construction of pyramids has not been talked about only recently. The great achievement is the organization of more than 100,000 slaves, who were divided into groups and directed to achieve the great goals and provide them with food, water, shelter and many more (Duncan, 1995).

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At the beginning of the Industrial Revolution, we find another example: textile mills in Yorkshire in England represent a model of technological innovation that has greatly increased efficiency. However, there was no reference to the managerial innovation that accompanied it and led to a significant increase in productivity by managerial methods no less important than the efficiency of new textile machines at the time. The concept of division of labor introduced since the beginning of the Industrial Revolution was a managerial innovation. In his book "The Wealth of Nations," Adam Smith spoke of the three advantages that led to increased productivity at unprecedented rates. This great managerial innovation is still the basis of managerial thinking. The development of management concepts since the beginning of the twentieth century has contributed to the development of our ability, to exploit our resources in a way that exceeds the impact of any other innovation in other areas. Therefore, the division of labor was a managerial achievement that contributed to the transformation of technological efficiency from a technical concept to productivity, as a holistic management concept that led to the development of different aspects of life in industry. More importantly, technological innovation has been and continues to be of great importance, while managerial innovation, despite its many manifestations and great effects, has been the least interesting.

2. Overview

This study seeks to provide a vision on the interpretation and evaluation of managerial innovation as a basic process that integrates with technological innovation, by improving the technical and managerial skills of companies to achieve their objectives. This vision was covered by the following dimensions: the concept of innovation, managerial innovation and productivity, technological Innovation and managerial Innovation, managerial innovation and its dimensions, managerial innovation: the productivity of knowledge.

2.1. Concept of innovation

Innovation is a general phenomenon with no time limits (even the primitives were able to discover agriculture and its symbol is the plow) and without spatial boundaries (civilizations in its continuous geographical emphasis on the fact that innovation exists everywhere), without limits in its subject and field (both natural and human). It is also present in the knowledge cycle and its sources of basic or applied research. In today's business environment, companies seem to be in constant need for innovation because of the intense competition between centers of development across continents. This competition has created innovation as a new dimension of strategic performance along with cost, quality, flexibility, and dependability. Therefore, companies adopt large-scale plans and programs in an organized and intensive manner and create large R & D budgets to accelerate innovation. Companies have also prioritized innovative training programs for their employees. A broad survey confirmed that 25% of all US companies employing more than 100 workers provide training programs on innovation to their employees. This represents an increase of 540% in the four years. According to Business Week, more than half Fortune-500 companies send executives and employees at different organizational levels to programs that seek to improve innovation for all employees and not only for a few employees (Mealiea

and Latham, 1996). That is why Drucker (1995) points out that since World War II, research and development have become like modern fashion in companies that have spent a lot of money on it, but the results in many companies have been improvements rather than innovations.

Historically, Physiocrats have emphasized that agriculture is the source of wealth; mercantilism has advocated that trade creates wealth, and advocates of industrial revolution believe that machines make money and create wealth. In the twentieth century, technological and managerial innovation led to a significant increase in production, cost reduction, and wealth creation. Innovative companies are, therefore competitive, and new products are reaching new customers and markets faster than their competitors.

This shift towards innovation and innovation-based companies is due to the fact that companies have large resources, high technology, and technical and managerial expertise to deal with innovation, as a distinct activity, in order to reach something entirely new (radical innovation or breakthrough), or improved in small steps (gradual or partial innovation). More importantly, they have a strategic vision of innovation that enables them to achieve a competitive advantage of innovation. Innovation means, according to a common definition, that what is new. What is new in this definition can cover different areas, especially the managerial and technological fields. In the managerial field, the new approach is to arrive at new concepts (such as the concept of zero damage, zero inventory, total quality management, etc.) and their applications. In the technological field, the new is the development of new automation models, and robot generations in the industry, computers, and cellular wave in the field of computing and communication. Peters defined the concept of innovation as dealing with something new, something that has never been tested (Peters, 1995). This expands the innovation to its maximum limits, because the new thing may be in anything and any field managerial or technological.

Schermerhorn (2012, p.213) defined innovation as the process of creating new ideas and putting them into practice, emphasizing that the best companies are the ones that reach creative ideas, and then put them into practice. This is another expansion in making innovation an integrated process from idea to product, or from new concept to practice. According to Schermerhorn (2012), this new expansion, which turns innovation into a market advantage in relation to competitors, is equally important with the innovation of the product itself.

In fact, innovation is not only a technical opportunity (new technology or a new product) that is reached in the R & D labs originally but also a market opportunity. This is part of the Japanese contribution in this area, as Japanese companies believe that innovation is the distinction of opportunity in the market, and the mobilization of resources to capture it. It brings the innovator closer to the entrepreneur, who can recognize the opportunity, and able to mobilize talent and resources quickly to seize that opportunity and turn it into the business. Equally important, innovation is a managerial opportunity to improve organizational efficiency or increase productivity. Another expansion for innovation by Lau and Shani (2008), after they defined creativity (reaching the idea) and innovation (the application of the new idea), (as we suggested at the beginning of this paragraph), they emphasize that the new idea may be a new technology, new product, process organizational or managerial processes.

Innovation may also imitate of a product, person, or idea used elsewhere, and its application becomes unique when placed in a new context.

It should be noted that this expands the innovation in the application, not limited to the technology or product, but expand it to the managerial and organizational innovation, also expands it- and this is important- to the imitation to find something new from it when placed in a new context. It must be emphasized here that imitation is not all outside innovation, but duplicated Imitation can be free of the new feature of innovation, there is a kind of imitation, which we call innovative imitation that comes with new improvements to what it imitates, in many cases superior to the original innovator. Here, we must point out that imitation is not the opposite of innovation, as many may think. The opposite of managerial innovation, for example, is stalemate and bureaucratic stalemate, which is a real obstacle to all forms and types of innovation, in maintaining the status quo in the company, and the market towards the new state of innovation, and maintaining discipline against the chaos that can come from innovation, and to maintain resistance to change in the face of innovation. Schermerhorn (2012) also talked about a business model innovation that could be part of management innovation.

Finally, we note that Drucker (1994) defined innovation as a systematic abandonment of the old, confirming that Joseph Schumpeter said that innovation is creative destruction in the sense of removing the old familiar system and introducing an unknown and new system to replace it. Indeed, when Drucker speaks of systematic abandonment of the old (past), it means the systematic introduction of the new (future). To achieve innovation as a systematic process, Drucker believes that all products, services and technology, a distribution channel. And different aspects of the company are periodically tested (every three years). In the information age and knowledge-based management, knowledge has become intensive information and innovation is intensive knowledge, in the context of the interrelated chain of data - information - knowledge, and innovation (Davis and Broken, 1994). Based on this broad vision, innovation is comprehensive in scope and diversity in areas including managerial innovation. The consultants of the Chicago-based Doblin Group, in their broader view, pointed out that innovation appears in ten categories: business models, networks, enable, core processes, product performance, product systems, service, channel, brand, and customer experience (Garr, 1999, p.16). It is clear from this vision that innovation goes beyond product and process, to areas that fall within the managerial innovation, in business models, networks, channel, brand, and customer experience.

2.2. Managerial innovation and productivity

Managerial innovation is the introduction of the new managerial procedures. Because the management is a conscious activity purposeful is directed towards achieving:

- the best response to the company's products and services, to the needs of customers as in the customization,
- to increase performance in a radical or gradual as in the concepts of re-engineering, the improvement of working methods and the study of work and movement,
- improving the working relations of the company, the concepts of teamwork and self-managed teams,

- improving the company relations with its external environment, as well as, the concepts of social responsibility and management ethics.

In this context, one can say that managerial innovation is to reach new concepts that are convertible into new policies, regulations, and methods that contribute to the development of performance in the company. Some of these concepts are related to the development and the organization of the innovation process, the transfer of new ideas to new products, and the speed of its creation for new markets. The ultimate goal of this innovation is to improve the use of resources to achieve better results, compared to the past period (as in historical comparison), or compared to the best competitors (as in competitive benchmarking). That can certainly be summarized by the fact that managerial innovation is at its ultimate goal is to increase productivity.

It is what one observes in the growing tendency to develop new concepts and their managerial applications to improve productivity. In fact, the creation of new concepts in management has always been the closest to productivity creation. Let us look at this from a new perspective, to point out that technology has made significant advances in development for greater speed of delivery, and higher efficiency in physical output (this is the engineering technological perspective of evolution), but the most important one has been in another area of productivity. In this context, we present an important aspect of our vision of managerial innovation. This aspect relates to Productivity Innovation. The industrial revolution was based on the technological breakthrough that took place in the textile industry in the eighteenth century. This technological breakthrough is paralleled by the managerial breakthrough, which is represented by the division of labor that led to the revolution of productivity. Adam Smith's book "The Wealth of Nations" 1776 explained the great role of division of labor to increase productivity, where the division of labor can be considered a great managerial innovation still relevant. If the tool is the symbol of the pre-industrial age, and the machine is the symbol of the industrial revolution of the eighteenth century, the arrival of new ways to use hand tools is the symbol of the revolution of productivity in the pre-industrial period. The division of labor is the symbol of the productivity revolution in the era of the Industrial Revolution. To continue the analysis, it was pointed out that the computer in the beginning and the network after that is the symbol of the revolution of information, and communication technology remotely, and that knowledge work in the beginning and management of knowledge work is the symbol of knowledge productivity revolution.

This vision suggests that the industrial revolution created blue-collar workers according to, the requirements of the machine and the production line, but the industrial revolution needed to be managed by them. Based on the division of labor, the category of managers who brought the industrial revolution to the productivity revolution emerged. Therefore, the increasing productivity at that time was the result of management more than it was the result of technology, although the latter contributed to making the productivity revolution with a strong physical - engineering ground. Similarly, the information communication technology (ICT) revolution has created knowledge and knowledge workers, but the productivity revolution in this area has only been achieved with the knowledge management that represents the new management innovation. The productivity of cognitive work has become the driving force of the 21st century (Garvey and Williamson, 2002).

2.3. Technological Innovation and Managerial Innovation

Historically, radical innovation has resulted in technological discontinuity and organizational continuity (Pavitt, 1990). S-curve innovation comes with new technology that leads to the break-up of the previous technological generation, but this is usually done within the same institutional, organizational context of the company (organizational continuity). Innovative discontinuity and organizational continuity were an inappropriate situation because what is required is that technological innovation is accompanied by organizational-managerial innovation to achieve its full objectives.

The technological revolution is a popular term and the most buzzing phrase since the 1950s. It undoubtedly points to the great fact that developments in science and technology have changed all the foundations, concepts, and methods of societies, including different industries and areas of application. With this acknowledgment of a technological revolution that seems like a real fact, another great revolution has not yet been recognized as the organizational revolution. This revolution is one of whose greatest achievements are the emergence of appropriate, effective, and innovative regulatory institutions that have been the heart of development for more than a century. These institutions represent the real organized factory of parallel productivity in its importance, and its human achievements to the achievements of the technological revolution, in terms of its technical and engineering achievements. Nobel laureate Douglas North believes that the absence of appropriate institutions was the cause of a century-long gap between the dawn of the Industrial Revolution and the 19th century Dramatic economic, technological expansion. Alfred Chandler, in his book, also argued that half of this transformation was the result of the organizational revolution and not of the technological revolution (Brown and Dayuid, 1998).

The business companies that have a great legacy of managerial development in concepts and methods have made it possible for 20th-century societies to develop with the same capacity as technology. With the fact that the technology itself, was the city of the organizational - managerial revolution, after the department of scientific research and technology management achieved a great advantages, and deep in order to make technological development possible and more rational, in the use of its great resources under the absolute uncertainty that prevails in the field of technological innovation. This does not reduce the use of the Internet as the ultimate technology because digital innovation is an extension of our previous internet management experience. In this context, we refer to two important observations:

- The Internet, which has provided the great technological potential for faster access to information, needs to be employed. That is why the management experience since Frederick Taylor till now offers great potential in how to transfer this information to the field of work (Dankbaar, 2003). With the Internet, what is required, is the transfer of management expertise to the field of information and information technology.

- In the digital economy based on the Internet, value is created across networks (Passiante et al., 2003). But if we look at the Internet as a fast and comprehensive flow of information available on the Web, all businesses and individuals enjoy this feature. Where is the excellence in creating value? This

excellence is in the management experience, and how to use that information better than others at the strategic level (which helps to achieve knowledge strategists), and technical level (which helps to achieve knowledge professionals).

2.4. Managerial innovation and its dimensions

The managerial innovation that we have identified, was the reaching of the new managerial, should raise the question about what this new managerial and what dimensions? To answer, we note that managerial innovation has many manifestations that can be summarized as follows:

2.4.1. General managerial Innovation

This set of managerial innovations refers to represent the major managerial turns in the evolution of management. The managerial schools (classical, human relations, situational, systems, etc.) represent general managerial innovations, each of which is characterized by a general and distinct managerial stage. In the managerial organization, there were important turning points, which consisted of moving from hierarchical to a matrix organization, which represented a dual organization. It was a hierarchical organization of managerial functions and a horizontal organization of technical functions, and then the transition to new types of organization such as horizontal organization, Self-managed teams. In this development, efficiency was increasing and the flexibility required in professional and knowledge-intensive work was growing. As well as, the transformation from the giant (the big is beautiful and effective), and the large production and economies of scale to small (small is beautiful and more distinctive) production of small meals (the system of Just in time) and economics of scope, and then the new turning point in the Internet era, the internet and e-management.

2.4.2. Innovation of managerial concepts

Management innovation refers to discovering entirely new ways to organize, lead, coordinate, or motivate (Hamel, 2006). This discovery of concepts is fundamentally related to finding solutions to management problems and improving management efficiency. The new management concepts have always been a source of improved efficiency and productivity, both in improving management understanding of employee needs (as in Maslow), in optimizing management decision-making (as in operational research methods), in measuring and improving financial analysis and performance (methods of financial analysis and portfolio management). In fact, this is the broader area of managerial innovation, because it is constantly loaded with new concepts aimed at improving the performance of senior, middle and lower management, and employees at all levels of the company. Total Productivity Management (TPM) in the 1970s, Total Quality Management (TQM) in the 1980s and 1990s, re-engineering in the 1990s, teleworking, the virtual company and the virtual teams at present, are all examples of managerial innovation in the field of concepts, and their applications in this or that field. Table 1 offers an important set of most recent managerial innovations.

Table 1: The innovation of concepts and managerial methods and their effects

Method	Evaluation of the validity of the decision	Performance evaluation	Returns system
T.Q.M.	√	√	
Re-engineering	√		
Outsourcing	√		
JIT system	√	√	
Balanced scorecard	√	√	
Quality circles	√	√	
Calibration	√	√	√
Costs based economic value added		√	√
Managerial empowerment	√	√	
Self-managed teams	√	√	
Venturing projects	√		
Incentive compensation			√
Reduced cycle time	√	√	
Strategic Alliances			
Management by objectives		√	
Performance Reviews (360 °)		√	
Matrix organizations	√		

Source: J. Brickley et al., (2003). *Designing Organizations to Create Value*, McGraw-Hill, New York, p. 271.

2.4.3. Re-innovation of the company

The biggest innovation for any company is the company's ability to stay in the market. To survive in the market (and perhaps grow in it), it has to constantly reconsider its assumptions about its internal environment (mission, strategy, core competencies), and its external environment (market structure, customer, competition, and society).

Since all internal environment factors (e.g., obsolescence) and external (changing market forces, changing customer needs, entering new competitors, new trends and regulations) can change a company, that cannot revise its core assumptions, and through an innovative vision, will face the most difficult fate of deterioration and exit. When competitors enter with new visions, concepts, and methods (meaning new and innovative basic assumptions), they will challenge the company's existing concept and underlying assumptions. The only way out is to re-invent the company by renewing and re-innovation of its basic assumptions in the three aspects confirmed by Drucker: assumptions about the company's environment, assumptions about the company's mission, and assumptions about the company's core capabilities to achieve its mission (Drucker, 1994).

As Drucker pointed out as a model of the challenges, the shakiest and shocking US companies were Japanese companies (which had new assumptions). If Pearl Harrier was one of the most military strikes of the US Navy, more Pearl Harrier was directed to US companies by Japanese companies. Many American companies have lost their business theory (basic assumptions and limitations) to the Japanese challenge (Drucker, 1994, p.103).

Perhaps this is the fact that companies are shocked by the increasing competition from companies, that come from different environments, and with new concepts and methods. That led John Brown to say that, the most important innovation that will come to corporate research laboratories will be to the reinvention of the company itself. This is more important than the innovation of new products. To keep pace with rapid changes in technology in increasingly unstable business environments, the company must design a new technological and organizational structure, which makes it possible to continuous innovation of the company (Brown, 1991). In this context, Gewritz (1996) argued for what he called the reinvention lifecycle in the company, as the innovation must cover the entire company, and its life to serve as a smart response to changes in its markets and external conditions. Also, he proposed a continuous cycle of re-innovation to keep the company in a constant state of change, as it changes in its markets. As this session can reveal that companies lose their strengths or weaknesses exacerbated over the time, which necessitates re-discovering the company to strengthen strengths and remove weaknesses to be able to re-locate in the market again in the light of that renewal.

After all, managerial innovation will continue to be a source of new ideas, to maximize the company's ability, to better utilize it's human, material and knowledge resources (internal efficiency), and to generate new concepts that contribute to the company's competitive advantage over its competitors (external efficiency). Also, managerial innovation is a source of new applications and practices, that make the company more capable of creating value for its customers continuously (sustainable efficiency), to keep the company in the market viable and growing.

2.5. Managerial innovation: productivity of knowledge

Knowledge management is the new managerial innovation that shifted the center of gravity in the attention and effectiveness, from material resources to knowledge as the most important new resource or asset in wealth creation, as well as, shifting focus in companies from managing stuff to knowledge management.

As noted earlier in this research, it is the managerial innovation that transformed the industrial revolution into a productive revolution. It is the new managerial innovation of knowledge management that plays a creative role in transforming the ICT revolution into a productivity revolution. In fact, information and communication technologies are all summarized today, by a single vehicle technology "the Internet", which has made information available in great quantities, in high speed and standard formats for all beneficiaries, and the forefront of these beneficiaries: business. However, it is noted that the information available in large quantities, can guide the management decision but, certainly from the perspective of competition to create a competitive advantage. The reason for this is that the information

available to all cannot create excellence, as long as, everyone has the same opportunity to access the same information, with the same amount and speed. That is why information must be transferred to knowledge. More importantly, there needs to be new management to transform information into new knowledge of core competency, and then employ it to achieve a competitive advantage.

In order to reveal the strengths of transforming the IT revolution into the productivity revolution of knowledge, some questions must be asked: What is knowledge? What does the new managerial innovation of knowledge management mean? Finally, what are the dimensions of knowledge productivity? In terms of knowledge, it is necessary to say that many definitions of knowledge have been presented, which can be summed up in two groups:

a) A set of definitions based on explicit knowledge and information technology: IT advocates tend to know explicitly and try to reduce them to the level of information. In this meaning, knowledge consists of data or information that is organized and processed to convey accumulated understanding, experience and learning applied to the current problem or activity (Turban et al., 2002, p.49). Knowledge is also what is integrated or presented in a way that can be processed by computer reside in an e-mail, voice mail, graphics, and unstructured documents as well as structured documents (Laudon and Laudon, 2017, p462).

b) Definitions based on implicit knowledge that resides in the heads of individuals: These definitions focus on the characteristics of implicit knowledge that can be shared and learned, but difficult to express or convey to others, where knowledge is defined as Knowledge is what remains in the head of the individual (Barquin, 2001, p.10). Knowledge is the fluid mix of experience, values, early information, and expert insights that provide a framework for evaluating and reporting new experiences and information.

If the first group is closer to information technology, and its superior form of the Internet, the second is closer to the managerial thought based on the human factor. Knowledge management (not the management of information as desired by the visionaries), represents the vision of managerial innovation that tries to give the company a higher value, by transforming its information into knowledge of higher value, and greater contribution to transforming it into a competitive advantage.

With the same distinction between technological engineering vision and managerial vision in the definition of knowledge, this distinction can also be clearly seen between the two visions in defining the concept of knowledge management.

It be can present two definitions of knowledge management that illustrate this distinction in this area:

- *Knowledge management* is the methodological process of directing the knowledge balance and achieving its leverage in the company. It refers in this sense to the knowledge of doing things efficiently, by leveraging knowledge (i.e., using it multiple times) so, the company can transform into a major source of profit (Davis and Broken, 1994). This definition is the minimum level in knowledge management because it uses the knowledge base (knowledge base explicit), and achieves its leverage of multiple cases or areas of use of available knowledge instead of using it to generate new knowledge.

▪ Because knowledge management is based on the fact that knowledge is the most important resource in modern companies, it does not only possess the knowledge; it seeks to enrich it by creating new knowledge. In this context, knowledge management is the systematic process of creative use and creation of knowledge. This definition is largely the concept advocated by Nonaka in what he called the Spiral of Knowledge creation and the four process model: Socialization, Externalization, Combination, and Internalization (SECI Model) (Nonaka, 1991).

It is noticeable from this distinction that technological innovation works to reduce knowledge to identifiable information. Also, innovation deals with it through a database or software, whereas managerial innovation is usually the creation of information, by transforming it into a knowledge of higher managerial value, both in the process of developing new products or providing better service in response to customer needs, or competitive advantage in the market. The dimensions of knowledge management as a managerial innovation can be determined through the following:

2.5.1 Need for knowledge management

The fact that information technology and its high application of the Internet prompted, some to put forward hasty ideas about the death or end of management, considering that the most important feature of the internet is the super-networking, (unlike the traditional system of hierarchical and limited connections). This interconnection is characterized by high speed, comprehensive connections here and everywhere, extensive and multi-faceted communication at the same time, and finally decentralization in communications, meaning that there is no center and another in the sense of communication. The question is : What does this mean in terms of management? The answer is that all companies have transferred an important part of their control over information and communications to the Internet. This means loss of management in companies for the possibility of achieving uniform control or subjecting employees to a unified base.

As some see, this networking has transferred an important aspect of management to what Yamashita calls interoperability. The internet, which makes the company operate in a decentralized manner, leads to the availability of communication channels between employees and work with suppliers, distributors, and customers (anywhere at any time), directly and more often without the need for management. This will lead to the re-division of managerial work, which will make 99% of managerial work transfer to interoperability (Internet, rules and open standards), while managers will have only 1% of the managerial process. This ratio of 1% is that the management sets minimum rules and integrates new activities into the system (Yamashita, 2000).

There is no doubt in the technological innovation represented by the internet, and the changes that came out are correct and must be taken into account, but what can be objected to, is the conclusion that builds on this technological innovation. The standard technical rules and mechanisms on which the internet is based can be a powerful management factor when responding effectively and can be a serious challenge and a strong threat to traditional management to change, and if it does not change effectively, it must disappear.

Let us take an example that helps to understand this. The advent of railways almost a century ago as new technology could have weakened small shops. But the management in these stores quickly moved to employ these technologies to the diversified stores that collect goods from all over the country in a convenient location for customers, which moved from their homes on the outskirts of the city. All this makes railways as a source of competitive advantage for diversified stores, (a management development of a larger retailer at the expense of small shops). As well as the development of postal and telephone services, the department has developed lists and catalogs of postal orders to reach customers in the countryside. Sears has described its catalogs as the cheapest on the ground and has compensated for the lack of personal service resulting from the use of those catalogs to guarantee money back (Garr, 1999, pp.42-43). This means and clearly indicates that management is not in the face of technology. The managerial innovation, such as technological innovation, is equally important. The management is required to use its managerial innovation capacity, to achieve the best use of technological developments to create value and achieve a competitive advantage, for the company and management to remain. If it fails in this mission, the company will retreat and retreat towards its inevitable fate: the demise.

2.5.2. Problems and failures of knowledge management

Knowledge may seem to be a guarantee against failure, considering that the difference between a rational and irrational decision, in essence, is, a difference in the amount of information or knowledge available to each. However, knowledge management has its own successes and failures. Their successes clearly indicate that firms with a managerial ability or managerial innovation were more successful, while companies that did not have such capacity or innovation were more likely to fail. This means that the mere availability of information technology (which drives companies to adopt new projects) has not been enough to succeed in knowledge management projects, especially since there is no infallible or uncertain management system. Equally, there is no guarantee that the adoption of information technology in its various forms will be successful in business. In this context, it is possible to refer to many cases of failure in knowledge management projects, where failures are estimated 50-70% in these projects. This is due to the most important reasons (Turban et al., 2002, p.417):

The knowledge management projects have relied heavily on technology, without paying much attention to whether the proposed knowledge management system is appropriate to their needs and objectives from a managerial perspective:

- The lack of support and commitment of senior management in knowledge management.
- No incentives provisions for individuals employed in knowledge management.

A study by Ernst & Young Centre for Business Innovation covered 431 US and European companies. According to the answers of the executives of the companies participating in the survey it was confirmed that the key difficulties in managing knowledge are: the difficulty of changing the behavior of individuals, performance of knowledge assets, identification of knowledge to be managed, justification for the use of scarce resources in new knowledge projects, knowledge of the company's current knowledge, etc. (Ruggles, 1998).

A five-year study by Fahey and Prusak (1998) covered more than 100 knowledge projects revealed the 11 most common fatal mistakes in knowledge management. In the forefront of these errors is the lack of distinction between data and information, on the one hand, and knowledge on the other (the second error). This position explains the fact that there are little education, training, and organizational experience for the required understanding of the concept of knowledge.

2.5.3. Knowledge Strategists

Lack of interest in the distinction between data, information, and knowledge has led to failure in knowledge management projects based on the latest software and IT facilities. In knowledge management, there is an important hierarchy of data, information, knowledge, etc. Knowledge management specialists have introduced this hierarchy in multiple forms, but they all share the fact that they start from the data that is considered the raw material to go up to the highest level, the most organized and valuable. It is the model of Haeckel, which includes five ascending levels ranging from data to wisdom (Barquin, 2001, p.4); data, information, intelligence, knowledge, Wisdom (which is the synthesis of knowledge and experiences).

Knowledge Strategists are responsible for taking care of what interests are (care of why). They are also experts on strategy and competition based on knowledge in the market and the competitive knowledge gap (the internal and external knowledge gap compared to the main competitors). These are the ones who capture deeply and effectively, the new roles of knowledge within the company, as the intellectual capital. Also, they identify the new source of property rights in the company, on the one hand, and outside the company by describing the knowledge in the process of generation and sharing and its leverage is the new competitive strategic weapon, on the other hand. Knowledge strategists are the ones that reassess or build a company's strategy not only based on its products, services, and processes, but also based on its knowledge, knowledge excellence, and production pattern. The crossing symbol for this category is that they are experts of competitive knowledge. In fact, it is this category that accommodates the cognitive purpose and is the expert in dealing with the external knowledge gaps of competitive knowledge. They are finally and simply responsible for innovation in the knowledge management strategy.

On the other hand, there are knowledgeable professionals, those who deal with knowledge as a subject. They are responsible for causal knowledge or know-what and know-how. This category is the expert in the methods of acquisition, assimilation, treatment, and effective methodology to make it able to work in different areas of use. This category is the core competency based on knowledge and the company's technical expertise in using knowledge. It is the core of the company's intellectual capital and its renewed ability to generate knowledge.

Knowledge workers work in the knowledge field to provide support to knowledge professionals. They collect, classify, schedule, store, deliver, and respond to all requests related to raw materials. They are truly in the knowledge-based economy, which corresponds to manual labor workers in the industrial

economy. The members of this group know very well what the knowledge professionals are talking about, what they need, and how to implement what they are asking for. Therefore, the members of this category represent the detailed operational efficiency related to the implementation of what the knowledge professionals ask them to make them more capable of carrying out their tasks. The code for this category is authentication and delivery.

3. Discussion

This study attempted to explain the dimensions of managerial innovation in which it has not received sufficient attention because of the dazzling of technological innovation since the industrial revolution has contributed to this inappropriate situation. Management innovation has become a major concern. Many studies have confirmed that technological innovation has been constantly associated with managerial innovation. New technology always needs new forms of management and organization. The technological innovation was the quickest to verify, followed by managerial innovation, which represented each time a process of balance of vision and disclosure of additional advantages and dimensions of more important in the recruitment and use of technological innovation.

Management innovation has become more important than in the past, even from the perspective of technological innovation because innovation management has been introducing new concepts and methods that make technological innovation more feasible and efficient. This is evident that the Internet and the internal and external business networks (technological innovation) have found their effective and more efficient effects in the virtual factory (Upton and McAfee, 1996) virtual organizations (Liston et al., 2008), the virtual value chain (Gunasekaran and Ngai, 2004), virtual teams (Blackburn et al., 2003). Virtual companies today represent an effective use of network technology in order to use the minimum number of employees within the company, and benefit from the largest number of specialists from outside the company to work on certain opportunities.

Technological innovation has always been the largest financial investment. It is also a shock in individuals (shock is the feature of the rapid adoption model of change). One of the reasons for the failure of technological change is the lack of integration with cultural change and increasing resistance to change as well as the failure of managers to achieve organizational response in the company (Daft, 2010, p291), especially in light of the historical experience associated with the technological substitution of the machine. While managerial innovation was less in need of large financial investments, introducing more organizational efficiency to technological innovation is related to greater managerial innovation capacity. The management innovation, which is associated with technological innovation, has contributed to improving performance and increasing productivity through new management concepts and methods of work. Technology management has also contributed to improving the performance of the technology itself and decreasing the dangers of new technology (Marcus, 2016, p.66).

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