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The New Approach of Performance Measurement in Knowledge-Intensive Organizations

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ABSTRACT

This article focuses on the performance measurement in knowledge-intensive organizations. The knowledge-intensive organizations have several characteristics which affect their ways of designing and utilizing the performance measurement. These characteristics include the dynamic business environments, complex intellectual work at all levels of company, effective use of information and communications technologies, quick information survey, revised knowledge and attention to each user's specific characteristics. This paper includes a review of recent literature on the performance measurement and knowledge-intensive organizations as well as the description of an experimental study conducted by Antti Lönnqvist in Finland in order to identify the important characteristics of knowledge-intensive organizations which may affect the performance measurement. This experimental study includes the interviews with four focus groups and it is conducted in Finnish knowledge-intensive organizations. Based on the conducted literature review and experimental study, a framework of explored topics in the use of performance measurement is recommended for knowledge-intensive organizations. This article aims at discussing the main elements which are investigated in the use of performance measurement systems for knowledge-intensive organizations. In this context, there are several different frameworks for performance measurement systems. Therefore, this paper does not only attempt to provide a special framework, but seeks to identify the important elements associated to the use of performance measurement in knowledge-intensive organizations.
KEYWORDS: Knowledge-Intensive Organizations, Knowledge Management, Performance Measurement

1- INTRODUCTION

According to the investigation of knowledge and the importance of its properties in the field of organizational performance, it can be found that the utilization of up to dated knowledge and information is an undeniable necessity for the survival of organizations. Particularly, if the knowledge change in society is accurately assessed, it can be found that the energy-making technologies are gradually replaced with the knowledge-making technologies in today's post-industrial society as an information community[1].Therefore, the management of organizations should make more rational decisions on important issues for improving the knowledge-intensive performance by relying on the superior knowledge. According to the importance and role of knowledge management, which seeks to explain and clarify the way of converting the individual and organizational information and knowledge in the organizations into the individual and group knowledge and skills, creating an environment for sharing, transferring and interacting the knowledge among the organizational members is among the primary goals which seem essential in this regard since the knowledge management can improve a wide range of organizational performance features by creating a smarter performance of enterprise [2].

The traditional performance measurement is one of the markets for managers to control their businesses. Furthermore, it seems that most of the management challenges in knowledge-intensive organizations are more difficult than the traditional business organizations, thus there is a real need for performance measurement in order to help the managers to control their businesses. Such these challenges are influenced by the management in knowledge-intensive organizations, and even some of the problems may cause due to the design and use of performance measurement.

Over the past decade, numerous studies have been conducted on the performance measurement [3]. Most of the frameworks of successful performance measurement have been provided and applied in the organizations. The performance measurement frameworks such as the BSC determine how we should choose the criteria for performance measurement system and how they can be utilized.

This article does not rely on the need for creating the new frameworks of performance measurement because there is not a need for creating another framework for performance measurement systems despite the good created frameworks. Instead, it focuses on the specific challenges about the way of applying the measurement systems in knowledge-intensive organizations. In fact, this research aims at investigating the key elements in application of performance measurement in the knowledge-intensive organizations. These elements are done by early identification of factors, which may be the main

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causes of performance measurement problems, and then some of the possible solutions are represented for challenging situations and this is a new approach in performance measurement of knowledge-intensive organizations.

Despite numerous types of literature on the phenomena associated with the knowledge-intensive organizations, this paper starts with a review of research literature and investigates the studies conducted in Finnish knowledge-intensive organizations and considers the results obtained from the focus group in these companies. Based on a combination of research literature and investigation of interviews in focus group, a new approach and framework is created for utilizing the performance measurement in knowledge-intensive organizations.

2- RESEARCH LITERATURE

1-2-Knowledge management concept

The historical perspective of modern knowledge management indicates that the knowledge management is an old demand. The knowledge, consisting of knowing and reasons of understanding, has been probably compiled by Western philosophers thousands years ago. Some researchers believe that the early human efforts in unfamiliar life environment have been the practical examples of search for knowledge and guiding that knowledge for understanding the relations and survival, and others believe that the efforts have been for obtaining the single and hypothetical achievement of what the knowledge discusses.

However, this paper mainly focuses on the knowledge and the economic effectiveness. Here, we refer to the main human role at the knowledge management level because this fact has been obvious that it is essential to achieve a level of effective behavior for higher competition and this requires the consideration of all individuals in the organization. In this regard, we should integrate and coordinate the individual identification, motivation, and satisfaction, the sense of security and a lot of other factors. Nowadays, the knowledge management is not created only by economic pressure, but the individual effective behavior is the important aspect of knowledge management.

According to the today's knowledge management, people should have the power to think and analyze the issues and they should have rational tasks more than the manual works, and we should give the staff the intellectual freedom in order to be able to comment on their work. These findings about the knowledge management have not just happened by chance, but they have been created as a result of long experience and work since the 1980s.

Different definitions have been provided for knowledge management, but in general the knowledge management is "the attempt to discover the asset lying in people's minds and converting this hidden treasure to organizational asset in a way that a wide range of people, who are involved in decisions of companies, can use it". Therefore, the knowledge management is a process which helps the organizations to find important information, select, organize and disseminate them, and it is an expertise necessary for activities such as understanding the problems, dynamic learning and decision-making [4].

2-2-Knowledge management process:

The knowledge management is not a linear and static process. In contrast, it is a cyclical and dynamic process which requires the employees who are constantly engaged with the information, acquire the new knowledge and apply it to improve decisions. During this process, they gain the new information and utilize the new knowledge in new situations and so on. Three groups of people are located in the center of knowledge management process:

1. People who should gain the knowledge.
2. People who should be willing to apply the knowledge.
3. People who should have the ability and wisdom to understand the appropriate time for applying the knowledge.

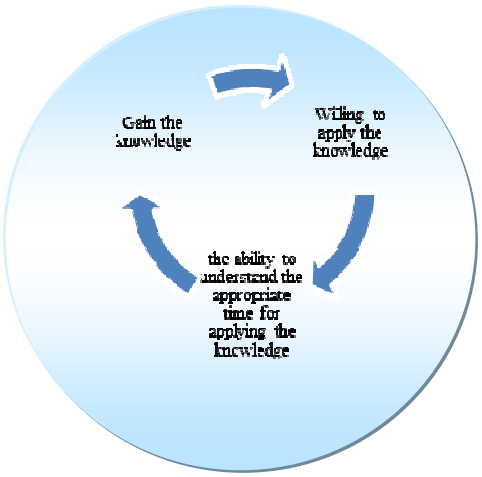

Figure 1. People involved in knowledge management process

3-2- Knowledge management steps: Knowledge management process consists of seven steps as follows.

First step: Gaining the knowledge: the knowledge management is based on the efforts in capturing and encoding the explicit and implicit knowledge in employees. If the employees do not have the knowledge, we will not need the knowledge management. Therefore, capturing the employees' knowledge is the first step in knowledge management process.

Second step: Listing the knowledge asset: An organization cannot manage the information and knowledge about which it does not know anything. Therefore, an organization, which has applied the knowledge management, should provide a list of existing knowledge and explicitly list its knowledge assets. However, there is no need to list all of the available knowledge, but we should focus on the critical, valuable, reliable and useful knowledge for organization or business unit such as the knowledge about the way of doing a particular job or task or the way of doing the reference work. • A list of subject or professional experts who have passed the highest levels of education and train or those who have been successfully able to do a particular work, • A list of experts who can solve the certain types of problems which may occur again, • The knowledge of past experiences: The certain processes which had been passed before and investigating their results, • The knowledge about the customers and competitors, • The knowledge of creating the successful teams for project: To know who has a set of skills to carry out the similar projects and has a background of successful teamwork.

Third step: Creating the link between the knowledge and strategy of organization: The third step in the knowledge management process links the list of knowledge asset to the key processes in company work and it is a driving force of strategy and performance in the company. The key business processes of a company may include the product development, service enhancement, customer management, sales and so on. This step helps to identify the most critical knowledge elements which are necessary for key business processes as well as refining the knowledge which has only the peripheral and side importance. According to the achievements of third step, the list of knowledge can be refined to create a hierarchy of critical and peripheral data elements.

Fourth step: Knowledge map: The fourth step of knowledge management process creates a knowledge map including the capture of key inputs and outputs of knowledge. The key inputs may include the specific data and information, verbal or written communications and other explicit and implicit shared knowledge such as the best experiences. The key outputs may be the internal documents, reports, research papers, procedures, internal benchmarks and best experiences.

Fifth step: Knowledge collection and organization: The fifth step of knowledge management process focuses on developing a process for systematic capture, record and organization of key knowledge inputs and outputs as well as finding, collecting and organizing the internal knowledge and the best experiences.

Sixth step: The knowledge accessibility and dissemination: The collection and organization of best experiences and other types of knowledge are meaningless in the case that the employees do not have access to them. Therefore, the sixth step of knowledge management process focuses on creating a mechanism for better access to this knowledge for its retrieval, dissemination, sharing, perception and frequent use.

Seventh step: Knowledge application: When the employees utilize the best experiences in new situations to improve their performance, modify and refine those experiences and gain the new set of best experiences in a way that it will be available to others in the future.

In summary, the knowledge management is a dynamic and cyclic process which consists of several stages. At the stage of knowledge gaining, the employees provide the knowledge. The organization lists its knowledge assets and provides the list of knowledge assets. This list links the knowledge to organizational strategy. Subsequently, the key inputs and outputs of knowledge are mapped and systematically collected and organized; a process is developed for providing the access to knowledge and its dissemination and the best experiences. The users have access to this collected knowledge and apply it to improve their performance and generate new knowledge in this process and so on. Most of the knowledge management projects are not seeking for the knowledge management of the whole organization, but the majority of them are responsible for the knowledge management of a special unit in the organization [5].

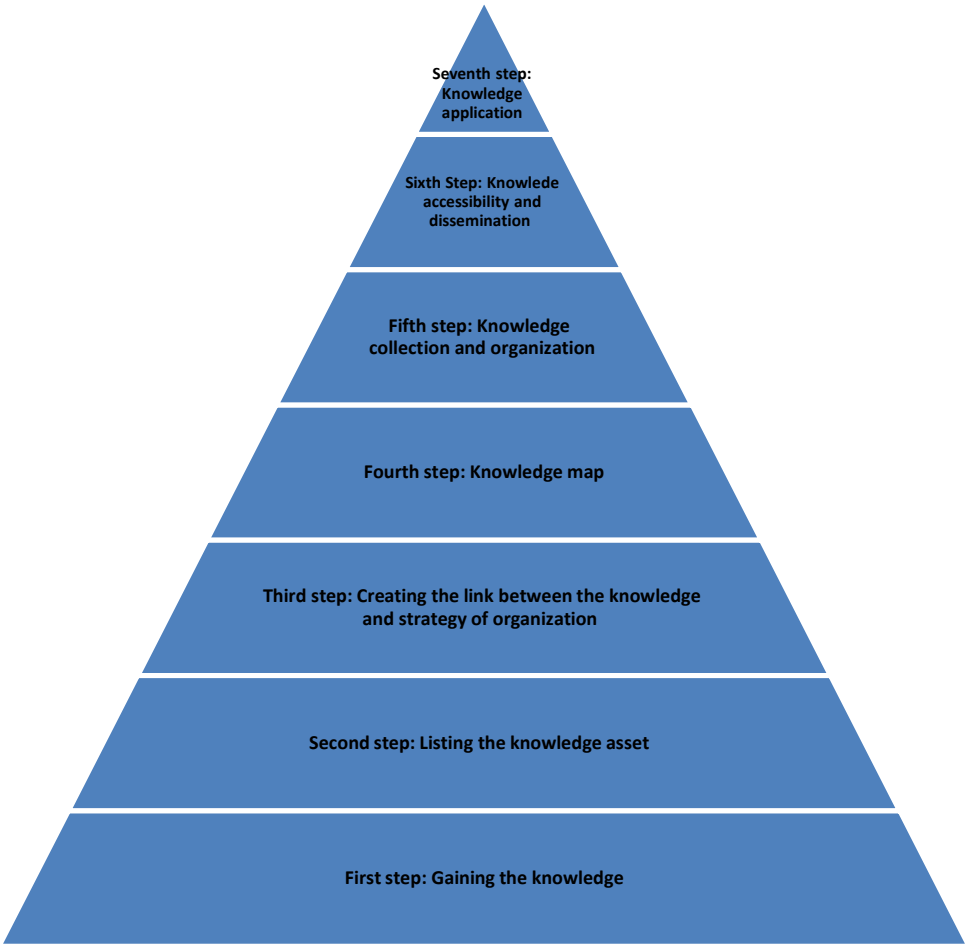

Figure 2. Seven steps of knowledge management process

4-2-Successful factors in implementation of knowledge management

Various frameworks have been provided for implementation of knowledge management until now. Passing through the review of these frameworks, here we only mention the factors which affect the successful implementation of knowledge management. Certainly, these factors are not comprehensive and do not include all factors. Here, we investigate the most important factors which need to be taken into account.

1- Effective management: The definition of leadership roles is one of the key points in implementation of knowledge management. This requires the cooperation between the senior managers and understanding the governing organizational culture and planning on this basis.

2- Culture: Establishing the knowledge management system should be from the perspective of users. The prevailing organizational culture should be clearly identifies in order to reduce the employees' resistance to new system by effective management and use of change management techniques, and we should move towards the knowledge management. Furthermore, we should identify and design the flow of information and knowledge in the organization.

3- Content Management: As a center of knowledge management, the content management is based on the retrieval, distribution and application of existing knowledge (the knowledge which is already gained).Keeping up to date and efficient knowledge according to the staff needs and demands is one of the key activities in the content management.

4- Technology: The technology is a facilitating and enabling tool which helps to implement the knowledge management in line with the organizational processes, systems and culture.

5- Measurement: Since the ultimate goal of knowledge management is to increase the efficiency and effectiveness, the determination of clear and precise criteria is very important on the basis of targets.

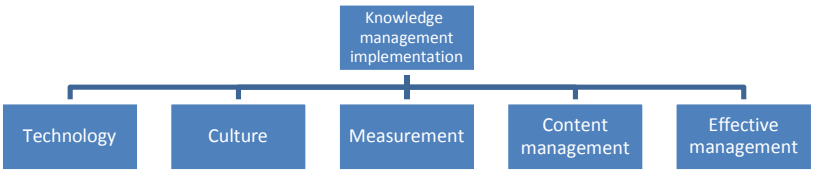

Diagram 1. Factors affecting the knowledge management implementation

5-2- Knowledge management challenges

The public and private organizations and the environment, wherein these organizations operate, have been heavily changed. To adapt to the changing and competitive environment, the organizations need to reconsider their structures and show greater flexibility than the past in overcoming the environmental changes. They also need the more sophisticated ways to manage their knowledge assets. They have to effectively control their knowledge cycles (the stages of knowledge production and dissemination) and effectively support the social processes which lead to the knowledge creation. The new organizations know that first the major part of their scientific assets is available for them in the form of implicit knowledge (the knowledge which people gain through the experience at work and it is not documented) and this form of knowledge needs more support by organization. Second, they need the coherent mechanisms which facilitate the promotion and exchange of organizational knowledge. Third, there is a need for adapting the work processes of organization to the knowledge users' specific characteristics (such as the individual situation in the organization, individual competencies, cognitive style, and individual interests and motivations) in order to maximize the quality of work in individuals.

The knowledge-intensive organizations in modern business environments are faced with a variety of challenges which are resulted from the characteristics and features of their business environment. Except for a few cases, these new challenges include the dynamic business environments, complex intellectual work at all levels of company, effective use of information and communications technologies, quick information survey, the revised knowledge and attention to each user's specific characteristics [6].

On the other hand, these systems have three constraints which are summarized as follows:

- Constraints on the implicit knowledge management;
- Constraints on the ability to engage the knowledge users in a dynamic, active and continuous knowledge exchange;
- Constraints on the support of each user (knowledge user) as well as paying attention to each user's specific role interaction in the organizations with user's competencies, cognitive style, interests, and motivations [7].

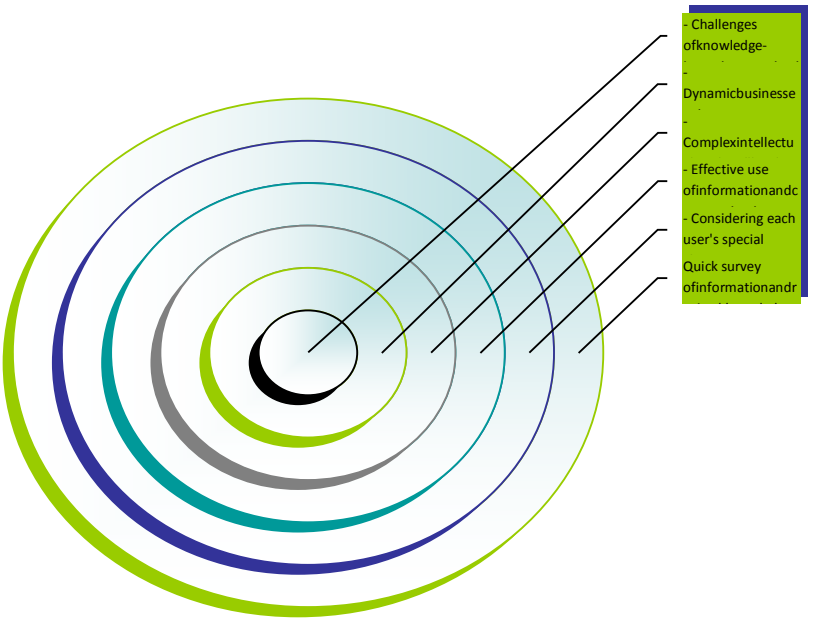

Figure 3. Challenges of knowledge-intensive organizations in modern business environments

6-2- performance measurement: The today's knowledge management is searching for ways to realize the vision, goals and strategies of organization and it is the criterion of successful performance. The performance management is one of the most important links in the management chain of organization and it has been replaced with the concept of performance management and has a comprehensive look at the organizational performance in recent years. The performance management subject is important in a way that the knowledge management experts believe that "what cannot be measured cannot be managed". Accordingly, numerous methods and techniques have been proposed for performance measurement, but a systemic approach to performance in the organizations is the most important issue, and the performance management considers such this approach.

Therefore, it can be concluded that: "The performance management is a strategic and integrated process which provides the sustainable success in the organizations by improving the performance in people, who work in the organizations, as well as developing the individual and collective capabilities"[8]. The performance evaluation is "the comprehensive performance measurement process in the form of terms such as the efficiency, effectiveness, significance, empowerment, accountability within the framework of principles and concepts for achievement of organizational, structural, and planned objectives and tasks, and long-term development of organization, and organizational performance measurement".

Given the importance and necessity of performance management, several systems have been designed in this regard. The most popular models are EFQM(European Foundation Quality Management), BSC(Balanced Scorecard), and BENCHMARKING, etc. which have been developed day by day according to the needs of organizations and they will be discussed in other sections.

3- Characteristics of modern organizations

It is difficult to find a clear definition of knowledge-intensive organizations, thus there are types of literature in this field. However, the knowledge-intensive organizations can be identified based on the following characteristics:

1- The intangible assets are your most valuable assets. The physical assets such as the machinery are put in the second priority.

2- The collection and use of new knowledge information is essential for success of organization.

3- The flexible organizations adapt themselves to changes and there are a few in organizational hierarchies in them.

4- The collection of their organizations is popular and their services are strongly dependent to their customers, suppliers and strategic partners [9].

The knowledge-intensive trait is basically just a feature of modern organizations. Other features are also associated with the knowledge-intensive organizations as follows: First, their business environments are rapidly changing and thus push them to change their strategies. Furthermore, the staff role is changed from the simple and controlled work to complex knowledge work as the employees have the high authority. Finally, the organizational structures are based on the processes or projects, and the structures can be flexibly changed in order to be properly used for commercial purposes.

4. Performance measurement in Finnish knowledge-intensive organization

In the late 2000, a study was conducted on the performance measurement in Finnish knowledge-intensive organizations. Therefore, a team was selected for interviews which were started from four focus groups in 4 companies which could be described as the knowledge-intensive ones. These companies included the manufacturing, industrial research, consulting and software businesses units. The achievement of deep and detailed understanding of the way, under which these knowledge-intensive companies were operating, was the main incentive of doing these interviews; they were able to solve the problems during their activities.

Each focus group was composed of 6 to 11 individuals who had come from various organizational levels. Each group suggested five relevant topics such as the changes in the operating environment (work), systematic work and strategy networking, performance management and criteria in an organization as well as the knowledge and technology and the impact of information technology, and requested for free discussion about each subject for 30 minutes.

The interviews of these four focus groups were analyzed by a team of five researchers. In general, as it was thought, the research findings were based on the literature of knowledge-intensive organizations. However, they have been emphasized in interviews in the field of evaluating the following points.

- The individuals have technical and networking communications in an organization. In other words, if the individuals decide to leave the organization, the intellectual capital goes with them.
- The knowledge employees need the information about the strategy of organization in order to be make decisions about their works.
- For rapid response to various changes, the organizations need the learning abilities.
- A knowledge-intensive organization should have a variety of functionality and technology as well as some basic functionality, and understand the customer ability and processes in order to evaluate the market.
- Intense focus on achieving the results may hinder the innovation [10].

The tips above clearly indicate some important characteristics of knowledge-intensive organizations wherein the performance measurement is successfully performed.

5- The major approaches of performance measurement in knowledge-intensive organizations

Nowadays, there is a public and fair understanding among the performance measurement researchers and it suggests that the use of some comprehensive measurement systems is the best way to measure the organizational performance. Some of the current famous performance measurement frameworks are as follows: BSC, performance pyramid, performance charter(Stockholder Approach to Strategic Performance Management) [11]. Despite the fact that these frameworks are different from each other, there are also a lot of similarities among them and this indicates that the organizational performance is comprehensively measured by criteria of different perspectives.

A comprehensive measurement system includes the financial and non-financial criteria such as the criteria of commercial consequences and the leaders of those consequences. The organizations need the information about the processes, consumers, competitors, market development and their financial position.

According to another feature of a comprehensive measurement system, the selected criteria should be aligned with the business goals obtained from an organizational mission statement and strategy, and as long as the business goals have not been changed, the measurement system will be changes in line with it. Therefore, we cannot rely on the strategic control of important success factors [12].

In the 21st century, there are the performance measurement frameworks which have been specifically designed for measuring the intellectual capital. They include the intellectual capital management model, balanced performance evaluation system, and intangible asset monitoring [13]. Most of these methods are basically and clearly similar to the functional evaluation frameworks which are previously described. According to the difference of this method with previous ones, the new methods focus on the evaluation of intellectual capital.

The comprehensive measurement frameworks, which include the intellectual capital frameworks, create the appropriate basic structures for building a measurement system for knowledge-intensive organizations. However, the characteristics of knowledge-intensive organizations affect the utilization and use of performance measurement methods. These effects can be classified into two groups which build the basic framework for the use of performance measurement in knowledge-intensive organizations:

1- Performing the new method such as the rapid change of business goals and organizational structures which require the specific principles for designing, implementing, and utilizing the performance measurement. Based on the specific needs of knowledge-intensive organizations, the following measurement principles are recommended:

- The measurement system should always up to date the changes of business objectives. Up to dating a measurement system leads to the removed the disabled criteria and selected new criteria.

According to this method, the measurement system continuously produces the relevant strategic information.

- This measurement system should make a connection between the strategy of organization and personnel.
- The measurement should be based on the processes or projects, so that the changes in the organizational structures do not hinder the organizational measurement process or on the contrary, the measurement processes do not hinder the organizational changes.
- The measurement should be designed in a way that the innovation is encouraged rather than hindering it.
- The knowledge employees are usually engaged in the information production and adding, thus the measurement system should be comfortable for them and without the overload information.

2-The criteria of specific success factors for knowledge-intensive organizations such as the intellectual capital should be provided in the measurement system.

Most of the criteria are created for new success factors such as employee learning, innovation, and satisfaction [14]. The intellectual capital is one of the success factors of knowledge-intensive organizations and includes the human, innovation, process and customer capital. Furthermore, there are the milder drivers which quickly provide the important information about the factors affecting the strategy outcomes, thus the measurement system of knowledge-intensive organizations should be include the criteria based on the accurate and strong financial processes and criteria in order to ensure that the financial capabilities and results are regular and the strategies are successful.

According to the above-mentioned issues and the achievements of this research, we provide a new approach which seems to be useful for measurement of knowledge-intensive organizations despite the fact that this model needs the localization and further study for application in Iranian organizations.

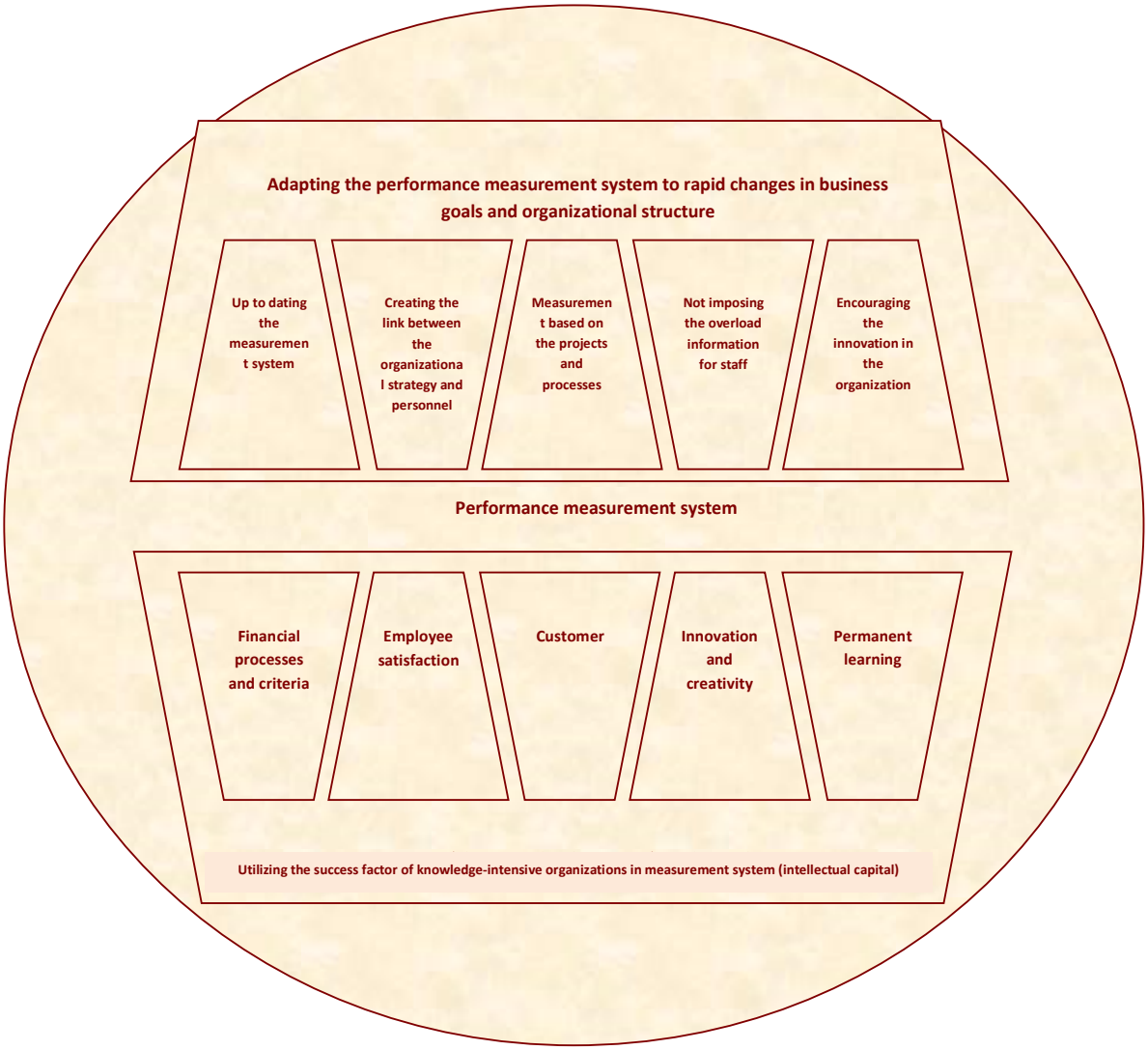

Figure 4. New approaches of performance measurement in knowledge-intensive organizations

6- CONCLUSION

According to the conducted studies and different provided frameworks in the field of performance measurement and their success, these methods can be utilized for performance measurement in knowledge-intensive organizations despite the fact that these frameworks should be applied by specific measurement principles and focus of measurement on the intellectual capital. These frameworks for utilization of performance measurement in knowledge-intensive organizations should be based on both the theoretical and experimental bases.

However, this framework has not been experimentally tested in Iran yet, and it should be clearly assessed in order to achieve the administrative value and it can be in the path of experimental future test and localized according to the position of knowledge-intensive organizations in Iran.

There are interesting research topics on the performance measurement in knowledge-intensive organizations in this approach. For instance, the intellectual capital criterion is often qualitative and it makes difficult to collect data automatically. On the other hand, the knowledge-intensive organizations are often busy and it is preferred using the automatic criteria for effortless and quick achievement of desired information. Furthermore, the rapid changes in the business goals and key success factors leading to the changes in the measurement system lead to the development of challenges in order to carry out the automatic measurement.

Resolving the conflicts among these factors is a research topic which seems to be worthwhile investigating.

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