MUTUAL DEPENDENCE BETWEEN QUALITY MANAGEMENT, KNOWLEDGE MANAGEMENT AND INNOVATION PERFORMANCE

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Abstract
From ancient times, wealth and power have been associated with the possession of physical resources. The traditional factors of material, human, monetary production were predominant of a physical nature. Therefore, the need for knowledge was limited. The industrial revolution of past centuries was predominantly based on human physical strength and money capital. A significantly different situation is foreseen for the future. Wealth and power in the 21st century will come primarily from intangible intellectual resources, from the capital of knowledge. The knowledge revolution therefore consists precisely in this transition from the economy dominated by physical, tangible resources, to the economy dominated by knowledge. The process is particularly comprehensive and profound, generating essential changes in all components of economic activities, analogous to those produced by the industrial revolution. We are currently in the early stages of the knowledge revolution. Products and services are more knowledge intensive. Due to this, the delimitation between products and services is becoming more and more difficult. Knowledge tends to become the main feature of activities, more than the resulting products or services. The impact of the knowledge revolution becomes visible in the volatility of the market, the uncertainties regarding the direction of economic activities, the job insecurity felt by people, etc.

Key words: *cost, innovation, knowledge, management, performance, quality.*

JEL Classification: *G32*

I. INTRODUCTION

In today's global competitive environment, which is constantly changing, quality management is the way to approach the scientific approach of organizational strategies capable of avoiding risks, uncertainties and crises of all kinds.

In conditions of increasingly saturated markets, competition becomes fiercer, and the winning entities will be only those who are able to exploit the advantages and opportunities created. In this context, the value of leadership and managerial decision taken at the right time is the essence of organizational value. At the same time, the existence of a solid organizational culture allows all members of the entity to understand the priorities, objectives and need for commitment to competition.

Knowledge of both the internal and external environment of the entity provides a clear picture of strengths and weaknesses as well as opportunities and threats, a context in which managerial decisions are made "knowingly".

Quality management is the one that ensures the capitalization of opportunities. In this sense, for an entity to become efficient it can use three essential approaches: the model of the ideal entity capable of generating maximum results from the use of available markets and knowledge, maximizing opportunities by concentrating available resources on the most attractive possibilities and using them to obtain the best results, maximizing resources so as to find the appropriate opportunities that allow optimal use of resources (Dragolea, L., L., 2006). Two distinct categories of opportunities can be highlighted, namely: the replacement of present products and activities with low yield as products and activities with maximum yield or approaching innovations, a category limited in number, but which concentrates the largest opportunities. Life has shown that market leadership is truly achieved by focusing on a market segment, a category of customers, or a technology. Everything that is marginal is not able to survive in the long run, nor to produce profit. The leadership position is transitory and has a short life. In business it is just like in a physical system, energy always tends to spread.

II. CURRENT STATE OF KNOWLEDGE

Based on a social approach, Daniel Bell (1973) defined knowledge as an organized set of factual statements and ideas, transmitted to others in a systematic way through a communication environment. Davenport and Prusak (1998) analyzed the concept in depth and presented it as a fluid mixture of experiences, contextual values, contextual information and professionalized personal experiences, which is the framework for evaluating and incorporating new experiences and information. Thus, they manage to differentiate among the factors of production in terms of integrative, human and transmissible.

On the other hand, Christian Fuchs (2003) turned to the technological dimension and described knowledge as a manifestation of information in the socio-human context. Although he continued to focus on emphasizing human character, he also brought to the fore the relationship between knowledge and information.

Knowledge management is found especially in the papers published by Professor Ovidiu Nicolescu (Nicolescu & Nicolescu, 2005; Nicolescu & Nicolescu, 2011). The expression based on knowledge comes from the expression knowledge-based used in the literature to develop organizational theories based on the concept of knowledge. But to say that management is based on knowledge is a semantic forcing because by its very nature management is based on knowledge. You can't do management if you don't have the necessary knowledge and skills. This means that management has always been based on knowledge. In this case we can no longer differentiate between the new field of knowledge management and management because knowledge-based management is equivalent to management as it was defined from the beginning. „As a science, knowledge-based management consists in studying knowledge-based management processes and relationships, discovering the laws that govern them and designing new systems, methods, techniques, etc., in order to increase the functionality and performance of entities, capitalizing on the great valences of knowledge. In formulating this definition we started from the presumption that the foreground of knowledge in the entities (as a resource, product, strategy, etc.) determines a fundamental change in managerial processes and relationships." (Nicolescu & Nicolescu, 2005, p. 203). If we accept the expression knowledge-based management, then we should use similar expressions such as: human resource-based management, talent-based management, finance-based management, etc., which does not happen.

The relationship between data, information, knowledge and wisdom has been analyzed over time, the four concepts being sometimes confused even if they reflect different stages of development. The data show a fact or event that is not correlated with other aspects. Their degree of complexity is low, being symbols without a meaning or value of their own. They have an objective, palpable existence and are easy to capture, store and measure. They have a low level of volatility and serve as a raw material in creating information.

Information occurs as data is correlated, acquires meaning, or highlights a cause-and-effect relationship. Like the data, they are measurable but the level of complexity and volatility are higher. Due to the fact that they have the role of describing, defining or providing a perspective on a situation, they are dependent on context and time. However, they are used to highlight what is already known and answer the questions: "What?", "Who?", "When?" and where?".

Knowledge is a model of thinking, feeling and behavior and appears against the background of contextualizing information, passing it through its own filter of thinking for a specific purpose. As a consequence, they are personal, subjective and internalized. They can contain strategies, practices, methods and approaches in synthetic forms, and most often answer the question "How?". Among their main peculiarities are (Giarini and Maliţa, 2005, p. 104):

- Human character. Knowledge is not found in raw form in nature but is a human and cultural product, being the result of an intellectual, cognitive and sensory effort. They also depend on the desire of individuals to share their experiences, thoughts and feelings with others or to use them in personal and professional life.
- • Diverse character. They do not only bring together aspects from a certain category but include a variety of emotions, values, experiences, theories, etc.
- • Transmissible character. Reflects the ability of knowledge to be made available to others.
- • Dynamic character. Highlights the ability of knowledge to be constantly changing, to evolve according to information captured from the environment (from other people, from various experiences, etc.) and the context in which it is necessary to activate them.
- • Reusable character. Highlights the ability of knowledge to be stored in a tangible form (documents, norms, etc.) or intangible (memories, emotions, behaviors, etc.) and used in another similar situation.
- • Financial nature. It generates revenue and can be earned in exchange for money. This is the case for the skills and behaviors that employees make available to entities in exchange for salaries, as well as the patents and licenses that entities either make or purchase.

- • Integrative character. They act as a link between the past, present and future. They manage to capture and realize the connection between what is known (past), what is perceived or discovered (present) and what is desired to be obtained (future).

Wisdom is the result of understanding the principles underlying the patterns of thinking, feeling and action, which is why its creation requires a greater intellectual effort than in the case of knowledge. This time, principles, personal reflections, archetypes, skills, abilities and behaviors are incorporated. Wisdom is the basis of decisions and actions initiated at the individual level, providing an answer to the question "Why?".

In a simplistic way, knowledge describes the ability (actual or potential) of an individual, group, or entity to perceive differences in a field (Laise et al., 2005) and to act effectively in a variety of situations (Bennet and Bennet, 2004). Therefore, they include both theoretical and practical aspects and relate to both cognitive and behavioral elements. They are the result of a continuous intellectual process of creating, acquiring, disseminating and using professional and personal ideas, values and experiences.

Over time, there has been an increase in the importance given to the management of intangible assets, which has led to the development of the fifth generation of management practices. According to it, the entity's orientation is no longer unipolar - towards customers - but bipolar - towards customers and knowledge.

Against these backgrounds, the entities focused their efforts on capturing, acquiring, creating, disseminating and using the knowledge held by consumers, employees, suppliers and competitors. In the early 2000s, about 80% of the directors of large entities in the United States, such as Amoco, Chemical Bank, Hewlett-Packard, Kodak, General Electric, 3M, and Pillsbury, argued that knowledge management is critical to defining and implementing business strategies (Takeuchi and Nonaka, 2002). Their statements are justified if we take into account the changes registered at the level of economic agents. For example, in order to better understand the expectations and needs of its customers, Steelcase reorganized its business so that the information collected from consumers reached the R&D department directly, while Toshiba focused its efforts on suppliers, on which periodically ranks them according to the performance obtained at the level of 200 qualitative and quantitative factors (Skyrme, 2002). Knowledge management initiatives have also been developed within the Indian entity Tata Chemicals, and the results have included increasing the number of patents, improving quality, developing employees and increasing productivity (Liebowitz, J., 2012).

III.TYPES OF KNOWLEDGE

Knowledge is the property of individuals and not of legal persons. You could even support your statement by emphasizing human character and arguing that what we think or feel matters only to us, while what we do affects others. It is only partially true. On the one hand, the statement that our thoughts, emotions, and feelings occur on an individual level is correct, but it must be borne in mind that they do not remain blocked at this stage. Knowledge is transferable and constantly evolving. Moorman and Miner (1998) argued that organizational memory is similar to individual memory and differentiated between the declarative and procedural levels.

Thus, “an organization that has been active in a particular industry for a long period of time will have a high level of development of declarative memory regarding the competitive structures and characteristics of the industry. It will also accumulate knowledge regarding the standard practices to be followed in the interactions with other economic agents operating in the same industry, which represents the procedural memory ”(Moorman and Miner, 1998, p. 708).

On the other hand, in trying to defend the point of view, the main typologies of knowledge are captured. Based on the idea of ownership, a distinction is made between individual and organizational knowledge. Those in the first category highlight a person's intellectual effort to understand a specific context or situation. The second category captures “managerial results regarding the integration of the knowledge of all employees and the generation of new knowledge at the level of the organization” (Brătianu, 2013, p. 207). Although the relationship between the two seems to be one of inclusion, it must be borne in mind that the sum of individual knowledge does not represent organizational knowledge. The latter presuppose, rather, a refinement of those in the first category, being the consequence of a collective intellectual effort.

Depending on the degree of visibility and transferability of knowledge, there is a difference between tacit and explicit. Tacit knowledge “is personal and very difficult to formalize which makes it difficult to communicate and distribute it to others. Subjective perspectives, intuitions and suspicions fall into this category. Moreover, tacit knowledge is deeply rooted in the actions and experiences of individuals, as well as in their ideas, values, and emotions” (Nonaka and Takeuchi, 1995, p.8). At the individual level, they present themselves as emotions and thought processes, while at the organizational level, they are incorporated in the form of processes, activities and relationships. They are the result of creative, divergent thinking and are acquired through "trial and error" actions. They are frequently used in areas where success depends on interpersonal interactions and skills and play a key

role in performing spontaneous, unpredictable and unpredictable tasks.

Explicit knowledge is „universal in nature, being applicable in different contexts" (Nonaka and von Krogh, 2009, p. 636). They are accessible on a conscious level, they refer to the elements that can be transmitted through words, sentences and phrases and they appeal to rational, convergent, logical thinking.

IV.KNOWLEDGE MANAGEMENT TOOLS AND TECHNIQUES USED IN SUSTAINABLE ORGANIZATIONS

Like any other organizational resource, knowledge must be planned, organized, coordinated, and controlled. These tasks cannot be accomplished through efficient human resource management even if the main "producer" of knowledge is the human brain, responsible for processing and contextualizing information, interpreting stimuli, understanding causal relationships, etc.

As a consequence, the concept of "knowledge management" was launched, which describes, according to the Encyclopedia of Communities of Practice, the set of processes necessary for capturing, coding and transferring knowledge at the level of the entity in order to obtain competitive advantages. Strictly speaking, the purpose of knowledge management is to transform individual knowledge into organizational knowledge, thus helping entities to "know what they know" and to always learn something new (Brăteanu, C., 2015).

Given the different aspects it addresses, knowledge management tools include methods and techniques for creating, acquiring, disseminating and using knowledge.

Methods and techniques for knowledge creation include those tools with which managers can stimulate creativity, divergent thinking and finding new solutions. This category includes brainstorming, quality circles, focus groups, communities of practice and mentoring programs. Through them, employees will analyze specific contexts, discuss issues and propose solutions that will later be translated into practices and procedures, becoming part of the organizational memory. They are commonly used at Buckman Laboratories, Clarica Insurance and Unilever. Knowledge acquisition methods and techniques refer to those levers that the entity has at hand to access the knowledge stock of direct and indirect competitors and suppliers. These include the procurement of patents and manufacturing licenses, the organization of trainings by suppliers, the attraction of employees from competing entities, the documentation of new technologies and communities of practice (Toma, G., S., 2017).

The methods and techniques of organizing and storing knowledge are strongly oriented towards managing, mainly, explicit knowledge. Thus, they include knowledge maps, K profile, intranet, best practice manuals and communities of practice. Their role is to ensure the preservation and accessibility of knowledge at the level of the team, the department of the entity. They are common in Hewlett-Packard, Frito-Lay's and Texas Instruments.

Knowledge maps have the role of highlighting who and what knows. Thus, they capture in graphic or tabular form the knowledge necessary to achieve the objectives of the entity and the sources of expertise. Their use allows the systematization of existing knowledge, encourages thinking in perspective, facilitates inventory and evaluation of intellectual capital, highlights effective and emerging communities, improves relations with stakeholders, streamlines decision-making processes and facilitates the identification of competitive advantages (Leon, R., D., 2014). They can be developed at the departmental, organizational or inter-organizational level. In the first situation, it focuses on highlighting the sources of critical knowledge for performing specific tasks within the department. Highlights work teams, their area of specialization, interdependence relationships and experts. In the second case, the interdependence between departments and the way in which the use of existing knowledge at the level of each organizational structure contributes to the achievement of business objectives is highlighted. Inter-organizational knowledge maps are developed within associations, holding companies, when several economic agents collaborate to achieve a common goal.

The methods and techniques of disseminating knowledge focus on streamlining their circulation in the organizational environment. The premise from which it starts is that, in the context in which they are stored in a report or procedure that no one knows about, then they cannot generate added value. The impact of knowledge management becomes obvious not only when it generates innovations but also in situations where it allows to avoid the resumption of auxiliary processes that can lead to "re-invention of the wheel".

The methods and techniques of using knowledge aim at the way in which what is known at organizational level can be translated into practice, generating added value. Among the most used are research and development programs, coaching sessions and communities of practice. A knowledge management tool appears to be useful in all five categories of methods and techniques, namely: communities of practice. Jean Lave and Etienne Wenger (1991), who developed the concept, started from the premise that people who have common interests are more likely to collaborate and learn together than those who have different opinions. Thus, communities of practice are groups of people who share a concern or passion for something they do, learning to do it better through regular interactions with each other. In order for a group of people to be considered a community of practice, three

conditions must be met simultaneously (Lave, J., & Wenger, E., 1991):

1. The existence of a field of common interest;
2. The perception of the community as a set of relationships between members, with the aim of learning together;
3. Effective activation of members in the field of interest.

In summary, the use of knowledge management methods and techniques in sustainable entities will facilitate:

- Retention of talents and experts - as a result of providing a framework for the manifestation, development and use of the knowledge held and the encouragement of collaboration;
- Increasing customer satisfaction - against the background of improving the capture and transfer of knowledge from them and adapting the range of products and services to their needs and preferences;
- Protecting market share - as a result of the efficient use of rare knowledge and protection against imitation by keeping them in the minds of their own employees, in organizational processes and in intellectual property rights;
- Entering new market segments - identified by the methods of creating and disseminating knowledge;
- Increasing organizational efficiency - due to the capture and use of knowledge from both internal and external sources;
- Development of partnerships with stakeholders - as a result of streamlining the exchange of knowledge between the entity and the members of the environment in which it operates;
- Increasing profitability - by reducing costs, streamlining internal processes and increasing the autonomy of work teams (Leon, R., D., 2014)

V. TRAPS IN KNOWLEDGE MANAGEMENT

Knowledge management has a fundamental role in the development of organizations but its effectiveness depends on the extent to which the manager avoids the following pitfalls (Fahey and Prusak, 1998).

Trap 1: Non-differentiation of information and knowledge data. As a result of the two approaches that dominate the field of knowledge management - the technological and the managerial, managers can become confused about the relationship between data, information and knowledge. They can be attracted by the abstract, concrete side of the technological approach and can become „slaves" of information technologies. They will be focused on purchasing the best software products that will allow them to create databases on customers, employees and competitors. In this context, they will consider that the secret of success lies behind a database, a table that describes the behavior of employees, customers, suppliers or competitors, will constantly try to measure the so-called "organizational knowledge" and ignore the importance of skills, of emotions, values and beliefs.

Trap 2: Focus on capitalizing on the stock of knowledge and neglecting dissemination processes. Awareness of the importance of knowledge as an organizational resource, cumulated with the intensely promoted idea of Francis Bacon (1597) according to which "knowledge is power", determines managers to adopt an accumulation-oriented behavior; it seeks to acquire and store as much knowledge as possible in the form of reports, rules and patents, omitting their dynamic nature. They believe that the secret of success lies in the amount of knowledge stored and they become followers of the scriptural recordings of everything that happens in the entity. It is slowly becoming bureaucratic managers who demand the creation and observance of the exact codes of procedure, regulations and norms. They do not take into account the continuous evolution of knowledge and the fact that it is a critical resource precisely because of their ability to generate new knowledge. For this, however, their dissemination at the level of teams, departments and the entity as a whole must be encouraged.

In the context in which success depends on the involvement of several people, they must communicate with each other, to exchange knowledge. In other words, managers must also consider the dissemination of knowledge in the organizational environment, not just their accumulation and storage.

VI. INNOVATION PERFORMANCE INDICATORS

At European level, performance indicators for research and innovation directly related to quality and knowledge management have been set by the European Commission and refer to the European Innovation Scoreboard, the Regional Innovation Scoreboard, the Science, Research and Research Performance Report. EU Innovation (SRIP), Transition Performance Index (TPI) (https://cdn.edupedu.ro). They are indicators that measure innovation in different fields of activity, from education to culture, to economic activities in the sectors of activity of a country. Innovation meets the needs of European Commission requirements, and these indicators are interdependent with quality management concepts, in line with knowledge management. Just by combining the three concepts, we will get a high degree of innovation.

The European Innovation Scoreboard provides a comparative analysis of innovation performance in EU countries, other European countries and regional neighbors. It assesses the strengths and weaknesses of national innovation systems and helps countries identify areas for action. The European Innovation Scoreboard 2021 was launched on 21 June 2021. This year's EIS report is also accompanied by the 2021 edition of the Regional Innovation Scoreboard, which provides comparable results for 240 regions in 22 countries. EU.

We present the regional map of innovation performance, published at the end of 2021:

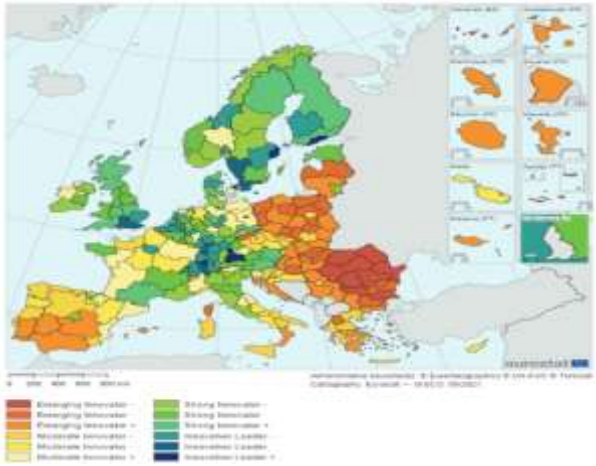

Figure 1 Regional map of innovation performance (https://ec.europa.eu)

The Regional Innovation Scoreboard (RIS) is a regional extension of the European Innovation Scoreboard (EIS), which assesses the innovation performance of European regions on a limited number of indicators. RIS 2021 provides a comparative assessment of the performance of innovation systems in 240 regions in 22 EU countries, Norway, Serbia, Switzerland and the United Kingdom. Cyprus, Estonia, Latvia, Luxembourg and Malta are included at country level.

The 2021 regional innovation scoreboard, RIS 2021 follows the revised methodology of EIS 2021 and uses data for 240 regions in Europe for 21 of the 32 indicators used in EIS 2021. The new RIS has four new indicators compared to the previous edition, namely individuals who have general digital skills above basic innovation spending per employee ICT specialists employed air emissions from industry.

This new edition of the scoreboard shows that the performance of innovation has increased for 225 regions out of a total of 240 regions in the period since 2014. The most innovative regions are usually in the most innovative countries. The most innovative region in Europe is Stockholm in Sweden, followed by Helsinki-Uusimaa in Finland and Oberbayern in Germany (https://ec.europa.eu).

The SRIP report analyzes Europe's performance in science, research and innovation and the factors underlying that performance in a global context. It combines the announced, indicator-based macroeconomic analysis with in-depth analytical research on important policy topics. This is a flagship publication for the Commission's research and innovation department. New editions will appear every 2 years.

Research and innovation play a key role in providing solutions to overcome immediate challenges, such as the coronavirus pandemic, and to make our society more resilient in the long run.

Europe needs to address the double challenge of the green and digital transition to become a modern, resource-efficient and competitive economy. This means that research and innovation policy will need to be adapted to ensure that it contributes to sustainability in its greatest social, environmental and economic sense, while stimulating the EU's competitiveness.

The five principles that guide research and innovation policy in Europe are:

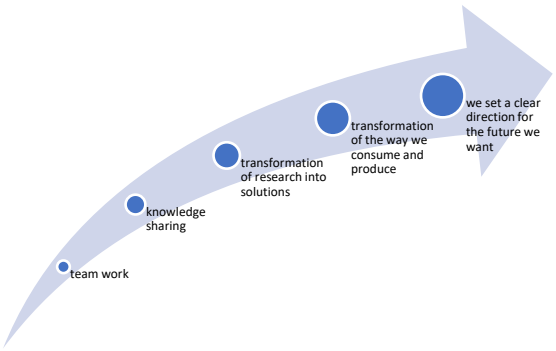

Figure 2 Principles guiding research and innovation policy in Europe (https://european-union.europa.eu)

TPI is a dashboard that monitors and classifies countries based on the 4 transitions to a fair and prosperous sustainability.

The transition is measured in 4 dimensions:

• Economic (education, wealth, labor productivity and research and development intensity, industrial base);
• Social (health life, work and inclusion, free or unpaid time, equality);
• Environment (reduction of greenhouse gas emissions, biodiversity, use of materials, energy productivity);
• Governance (fundamental rights, security, transparency, sound public finances).

These measures underpin a new model of prosperity for Europe and the world. A model that focuses on resilience, inclusion and sustainability and supports the EU's Annual Sustainable Growth Strategy for 2022.

All EU countries and 45 other countries are included in the ICC. The index consists of 28 internationally comparable indicators and helps people see how their country is progressing towards the Commission's 6 priorities. It illustrates how each country performs on each of the 4 dimensions, provides an overall performance by country, indicates strengths and weaknesses, room for progress and possible trade-offs (https://ec.europa.eu). The ICC is also a tool to give more visibility and traction to the annual monitoring report of Eurostat's sustainable development goals, by ranking and comparing with the EU average and with non-EU countries, and is accompanied by specific descriptions of 72 countries. of the progress made over a period of ten years. It is also unique in its exceptional global size, which covers 76% of the world's population, and in its 10 years of return from 2011 to 2020.

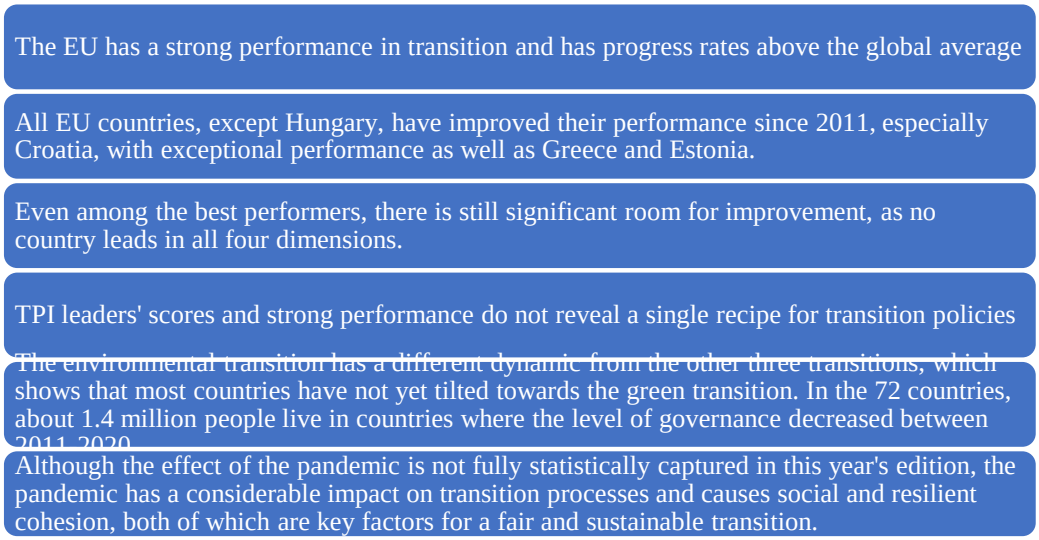

Figure 3 Key discoveries about innovation (Stănescu, S., M., 2009)

VII. CONCLUSIONS

The major importance of the information provided by the accounting system for the management of any economic entity as well as the obligation to comply with accounting and tax rules makes the creation of the accounting database in accordance with economic realities, without overestimation or underestimation, day by day

so moment, either the management, or the state, or any of the control body should not be in a position to make decisions on an erroneously constructed database.

Accounting information, whether we are talking about financial accounting or management accounting is the main element in the construction of accounting information either from a managerial point of view or from a financial point of view (Vătășoiu, C., I., et al, 2010). The establishment of a database in accordance with economic realities, thoroughly and rigorously organized in a form accessible to tax management and reporting, determines its credible, easy and complete operation at all times. The need to report accounting information in a uniform manner for all economic entities has led to the standardization of reporting and the start of a process of standardization of accounting by adopting common general regulations establishing rules for the preparation of documents, signing and auditing for the purpose of their publication. Regardless of the information traps in which managers tend to be caught, in order to facilitate their activity and to obtain efficient results in a short time, in order for an economic entity to be innovative and efficient, it must respect the principles of innovation. At the same time, in order to be innovative, an economic entity needs to know the key discoveries regarding innovation, both at national and European level.

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