

Part 2

THE KNOWLEDGE ECONOMY

At the end of the 20th century, society has entered into an information stage of development, which, by some authors, represents the first stage of the post-industrial society. It is a new high-quality stage in the development of civilization. Its main goal is to master and widely use the information in all areas of the economy and society. This is evident in:

- the turbulent development process of informatization, which has the character of global technological revolution, and
- the dominant role of information in processes of modern economy functioning.

Its special and strategic importance is given in profundity of changes, level of development, the scope of the use and importance of information and knowledge, their role in the transformation of very large economy and society fields, as well as in principle the formation of (paradigmatic) new opportunities for their usage.

Knowledge economy can be seen as a civilizational step to the system of institutions that regulate economic relations in a way that favors the production, formalization, expanding and use of a knowledge. It is directly linked to the reproduction of a non-public and a formal knowledge, influencing the development of human capital.

Parallel with the process of globalization, new areas of the economy have been created, in Western literature marked as “knowledge economy” or “information economy.” Knowledge economy is a specific and independent phenomenon, corresponding to modern changes in the environment, information and communication technologies. K. Smith (2002) denied its phenomenological significance, indicating that the notion of “knowledge economy” was rhetorical rather than analytical. Therefore, the knowledge economy is an open discussion. The question is whether it really is and to what extent a quality new development stage, which replaces the industrial era? Prosaic definition emphasizes that the knowledge economy is when companies connect computers and edu-

cated minds to create profit. It is based on strengthening the strong tendency to accumulate wealth and increase competitive ability on the intangible assets (human capital, knowledge) basis. In this regard, the OECD lists the parameters of modern development:

- participation of senior technology sectors (high technologies) or leading high tech (leading edge),
- innovation activity,
- the investment level in the field of knowledge (high education, scientific research, development of software security, etc..),
- production and application of information and communications equipment,
- software products and services,
- increasing the number of employees in science and high technology,
- the scope of international cooperation in science and technology and so on.

The three main driving forces of modern knowledge economy are the knowledge (conditionally: intellectual capital), changes (creating uncertainty and risk, reducing predictability) and globalization (unification of production, trade, finance, means of communication and information technology, scientific research, competition and other areas).

Ideology “Knowledge is Power” by F. Bacon from the 17th century, was completely realized in the knowledge economy. The knowledge was considered a new factor of production, the basis of the development of service sphere, the basic factor of human capital, ICT and innovation, a key source of competitive advantage and growth of companies, regions and national economies.

The knowledge economy has been formed and expanding, based on the use of knowledge as unique, unrestricted and independent resource that can not be substituted by other resources. It has transformed the knowledge into economic goods and income, in the most economic branches, not only in those directly associated to the highest technologies. Organizations have been increasingly transformed to innovation. In this case innovation has become not only the products and technology, but also the organization and interactions with customers. Increasing the competitiveness of organizations and industry knowledge has enabled their sustainable economic growth and development. *“Expanding the bag of useful knowledge and fields of its application is the essence of modern economic growth,”* said S. Kuznets.

The knowledge economy is characterized by a higher degree of risk, because the changes are exponentially increasing and the emergence of new knowledge and innovation rapidly devalues both material and non-material elements and factors of production. It means combining conventional economic theories, based on laws of the market and the benefits of economic goods, with concept of intangible value. Competitive advantage is moving from physical to intangible, from invisible to visible. The knowledge economy can be seen as:

- a part (section, sub-system) of the system, which is associated with the processes of creation, dissemination, and utilization (application) of knowledge,
- scientific discipline that studies the processes mentioned above and records dynamic development, and
- characteristic of specific economic state, where knowledge is emerging as a key determinant of development.

Knowledge, information, skills, innovation and new ideas revolutionary push the boundaries of social and economic development, becoming a key wealth and production resource. Many authors believe that they dominantly direct the movement of so-called “global order” towards the post-industrial era. This has been evidenced by the radical development of information, communication, cosmic, biogenetic, transport and other modern technologies. Their boom contributed to the creation of real conditions for the existence of, at least, virtual “world of worlds” (term by M. Gefter), characterized by homogenisation and synergy of different economies, politics culture, people, space, and civilization. In his book “The Third Wave” (1980)

A. Toffler predicted a new culture based on information. He divided human history according to certain patterns of behavior and social characteristics in waves, bringing civilization changes in the technological and social sense. The first wave began when man left the nomadic way of life and started to work in agriculture. The second wave of the industrial revolution began in the 18th century. The third wave represents the transition to information society or knowledge era. Reminder: A. Toffler (1990, p . 12) wrote that most of the information will be available to everyone, that the information and knowledge will become objects of property as so-called “symbolic capital.” Generally speaking, this symbolic capital is a sum of a specific manufacturing resources (non-investment). Modern managers must have a good instinct for invisible and intangible assets of people, featured in the minds and experiences of employees. Without those assets, companies can not have good vision and the ability to predict the future.

Pre-industrial era was characterized by “a man playing with a nature,” industrial era was characterized by “a man playing with an artificial nature” (man-made), and the post-industrial civilization is characterized by “men playing among themselves”.

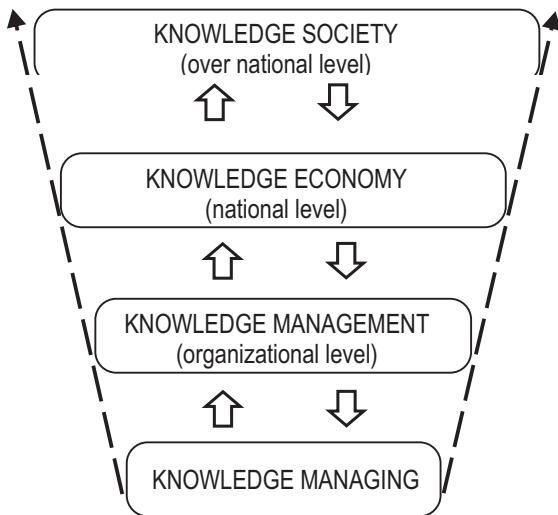
It means overcoming the traditional way of thinking, behavior and organization, because “associative people” have a higher level of a creative thinking (knowledge). This is era of fast, dramatic, complex and unpredictable changes. Technological, market, economic, political, social, institutional, and global factors influence the speed of change and form the theory and practice of economics and management. The concept of knowledge management (KM) has become one of the key elements for creating a competitive advantage in the new economy and management. It is a crucial method for the challenges and dangers of modern and uncertain business environment to become an opportunity for the successful operation of modern organizations, and to build competitive advantage on that basis. Its perspective is to observe the contemporary issues in the light of the critical issues of organizational adaptation and survival under conditions of discontinuous changes in the environment, and to find the unity of IT and the creative and innovative capacity of people.

The new world of business imposes the need for diverse and complex interpretation of information, generated with the help of information systems. Such diversity and complexity is needed to decrypt many visions of the world and its uncertain future. Understanding the non-linear change requires:

- appropriate strategies, based on dynamic information stored in databases of modern companies, and
- advanced flexibility and ability to understand and build consistent views of the future.

D. Grey (1996) said: *“Knowledge is the full utilization of information and data related to the potential of human skills, habits, ideas, intuitions, commitments and motivations... Knowledge is action focused on innovation, union experts, special relationships and alliances. Knowledge is enabled by value-added behavior and activities. To have value, knowledge must be oriented, modern, tested and divisible.”* Davenport and Prusak (1998, p. 5) wrote that knowledge is *“a myrrh mixture of framed experience, values, contextual information and expert understanding of what is the basis (frame) for evaluation and incorporating new experiences and information.”*

FIGURE 2.1: LEVELS OF ATTENTION GIVEN TO THE KNOWLEDGE



Source: Antosova & Csikosova 2011, p. 128.

It is clear that the importance of knowledge should be risen to the highest possible level. It should be institutionally regulated and forced according to the developed countries, in order to avoid any possible substitution, manipulation, negative selection and unprincipled (ab)use. Lord Byron said, *"Do not fear of ignorance, fear of false knowledge because of it come all the sorrows of the world."*

Traditional sources connected with industrial era are not just ones where is necessary that organization gives attention at present transition to knowledge society and knowledge economy. Stable tempo of performance growth and completion convenience can secure for 21st Century only strategic source - knowledge. Therefore knowledge as strategic source is more and more in attention. That resulted that knowledge management had become more and more spoke about in theory and practice of organization management. Also, organization gives attention to basic principles of knowledge management. They can be applied in business organization, education institution, health organization, and also in offices of state administration.

Growing importance of knowledge can have attention at some levels (organizational level, national level, and over national level). The levels of knowledge have been subject of expert discussions among theoreticians and practicing, but still in present time exit confusion or obscurity. According to Bures (2007), the basis is knowledge management where products and outputs have application at organization level (see Figure 2.1). Organization level creates basis for knowledge economy at national level and also for knowledge society at over national level. There are more expressions in expert literature related to the field of management of knowledge, for example: „knowledge managing“, „management of knowledge“ or „knowledge management“. Obviously, they are very similar from the general theoretical view, but in reality they are very different from the view of the content.

1. PARADIGMATISM OF THE KNOWLEDGE ECONOMY

The importance of knowledge in economy and society was firstly observed by P. Drucker. He used the term knowledge economy and knowledge society. In the 12th chapter of his book *The Age of Discontinuity: Guidelines to Our Changing Society*, also called *The Knowledge Economy*, he explains the forces that are changing the present economy and creating a future society. In addition to the rapid development of technology, globalization and the emergence of new political and social challenges, the main characteristics of the n.e. are knowledge and education, as well as their influence on work, leadership and society at large.

The modern knowledge economy has, *in practical terms*, paradigmatic character and is based on four foundations: education, informational infrastructure, developed effective economic institutions and developed innovative systems (network of universities, laboratories, research centers, institutes, etc.). It is understood and terminology has been used in two contexts:

- *scientific*, as an empirical hypothesis about the generalization characteristics and development trends of modern society, and
- *socio-political*, as declaration, development landmark, goal and vision of the future.

TABLE 2.1: CHARACTERISTICS OF TRADITIONAL AND INFORMATIONAL RESOURCES

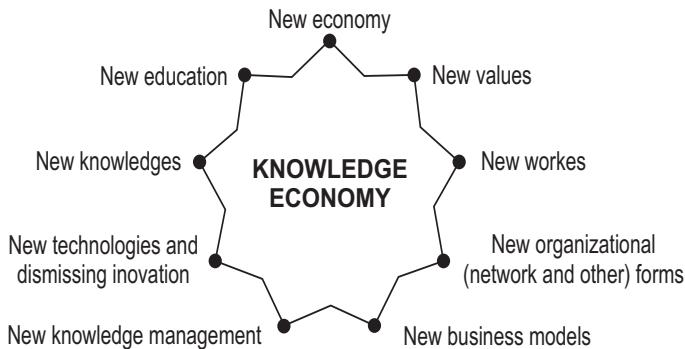
<i>Traditional resources</i>	<i>Information resources</i>
limitations, tangibility, traditional occupations, declining marginal utility, material flows and stocks, reducing in the usage process, private goods, serial (mass) production with high costs, economies of scale, dirty technologies, the extensiveness	limitlessness (availability), intangibility, discretion, consistency (non-vanishing), new structure and quality of employment, network effects with increasing border usefulness, non-material stocks and flows, expanding in the usage process, public good, low-cost circulation, innovation and improvement, design, usefulness and functionality, new product quality

Source: Adapted from Gaponenko, Orlova 2008, p. 15; Hawken 1983, pp. 3-56.

Regardless of whether specific knowledge implies the ability to collect and use information, a set of skills and ideas, a set of experiences, information, opinions, and expert insight, intuition, or the ability to solve the problem, identifying changes and the like, for the topic that is more important conclusion of P. Drucker (1950, 1968) and F. Machlup that use of knowledge, as one of the efficient production and resource management in the enterprise, leads to a quality foundation of the economy and society in general, ie. *the knowledge economy* and *the knowledge society*. Because “*the future belongs to those who work with their minds, not with their hands*” (F. Bacon).

Paradigmatism of knowledge economy is reflected, among others, in taking the concept of creative industries from the West by some Asian countries. Some theorists (eg, S. Cunningham, 2009) emphasize the dynamism of the creative industries in Asia.

FIGURE 2.2: STRUCTURE OF THE NEW PARADIGM OF KNOWLEDGE



Human knowledge is a dynamic category that is constantly improving along with the development of science and technology. Direct results is the rapid obsolescence of existing knowledge. Therefore, the concept of permanent learning is gaining in importance and it is becoming one of the most dominant strategic goals of modern organization management. For a company to maintain realized competitive advantages, it must constantly analyze and predict business environment, selecting the best strategy. This is not possible without various forms of expertise, which must constantly evolve in order to increase creativity and innovation among all employees.

Box 6 - Knowledge Economy Form and History

National and regional leaders have increasingly focused on knowledge-based economic activities, presuming that future economic prosperity will depend on knowledge-based activities and a similarly capable work force. Of course, in a sense, a knowledge-based economy has existed since the dawn of human civilization and its evolution has been based on its ever greater accumulation of knowledge over time. Societies benefited from knowledge in the form of the goods and services that were produced and made available to meet socioeconomic needs. Knowledge was incorporated into the production function in the form of human capital. In the early economic literature, there were no specific references to the importance of knowledge. Economists began to realize its importance in the late 19th century as Alfred Marshall suggested that "knowledge is our most powerful engine of production" and the organization facilitates the growth of knowledge (Marshall, 1890, p.115). In early 20th century, Schumpeter considered the "new combination of knowledge" as an important element for innovation and entrepreneurship (1911, p. 57).

Earlier in the 20th century, knowledge was neither directly measured nor incorporated in the production function. Researchers attempted to account for it through the unexplained portion of economic growth. The unexplained portion was labeled "technical change," "the human factor," "organization" or "measure of our ignorance" (Skilbeck, 1964), or "residue" (Abramowitz, 1956; OECD, 1964). In the neoclassical economic literature, innovation and entrepreneurship were considered essential ingredients of economic growth, while Schumpeter argued that technological change was the engine of economic growth (Schumpeter, 1939). Relating new knowledge to technical change, Antonelli (1998) suggested that the generation of new knowledge, in the form of technological change, resulted from the interplay of generic knowledge (codified technological knowledge with direct scientific content) and tacit knowledge (learning processes based on the specific experience of the innovator). Romer (1986; 1990) considered knowledge to be the third important factor of production. In an economically-progressive society, general knowledge and tacit knowledge work together, where scientific knowledge generation (general knowledge) leads to innovation (tacit knowledge). Although knowledge is important for economic development, it alone is not sufficient to bring about change in the absence of necessary infrastructure. Shapiro and Varian (1999, p. 8) argued that "...today's breathless pace of change and the current fascination with the information economy are driven by advances in information technology and infrastructure, not by any fundamental shift in the nature or even the magnitude of the information itself".

All economies have some stock of knowledge, but those that are growing are distinguished by the generation of new knowledge derived from existing knowledge. Private knowledge (tacit knowledge), either in economies or in social organizations, may become the property of the institutions. Some sociologists argue that such knowledge is the intellectual property of a labor (Locke, 1924), while others argue that it belongs to the public and needs to be communicated and shared (McFarland, 2004; Buchanan and Campbell, 2005). Today, information that is commonly available (information commons¹) and likely the result of the subsequent application of information, may become intellectual property. Information commons are more useful in either the economy or in an organization when it is codified, stored in the proper form, and made available for users. The advantage of storing knowledge is it can be retrieved and used in the production process, leading to further knowledge generation and updating the stock of existing knowledge.

In this process, social organizations play a pivotal role in information- or knowledge-based economic development. For example, universities, government, non-governmental and private sector organizations generate, store and disseminate knowledge, while many private sector organizations use the knowledge in production of goods and services. More importantly, the government provides the necessary infrastructure and regulations, not only to speed the flow of information but also to protect the intellectual property rights of individuals and organizations.

In economies, the functions of knowledge are characterized by four important features: a) knowledge ages rapidly and new knowledge is constantly replacing the old; b) scientific (including social scientific) knowledge is highly valued, and the scale and economic penetration of scientific knowledge increases through subsequent economic development phases; c) knowledge economies are especially characterized by the exploitation of new knowledge in order to create more new knowledge; and d) knowledge is used in the production of goods and services, and to enhance the social welfare of its citizens (Cooke 2002, pp. 3-4).

The characterization and identification of knowledge is a complex process. There are kinds of knowledge (know-what, know-why, know-how and know- who) which are important for knowledge-

based economies (OECD, 1996). The stock or knowledge of these ‘kinds of knowledge’ could vary from economy to economy, firm to firm, or region to region, and there is no clear understanding of what constitutes different kinds of knowledge. The relative lack of agreement in conceptualizing and defining the “new economy,” or “knowledge economy,” has hindered research in this area. The general description of the new economy is based, alternatively, on industrial composition (Goetz and Rupasingha, 2002); the degree to which industry sectors use advanced machines and management practices; or the relative proportion of an industry’s labor force being comprised of certain managerial and professional/technical occupations. Other research emphasized the influence and relative level of use of electronic communication and exchange, or E-commerce. These are only a few examples of the alternative conceptions of the new economy. Despite the fact that each of these perspectives has relevance, there remain fundamental questions about how changing technology and knowledge will impact the prospects of places and people.

The analysis and discussion of the knowledge-based economy could proceed in two categories. In the first, emphasis is placed on firm-level production, where knowledge is considered a factor or part of a factor of production, known as the “knowledge economy” (Schumpeter, 1939). In the second category, the focus is the aggregation of firms within a geographic region with the necessary infrastructure to utilize the full potential of the knowledge economy, also known as the knowledge-based economy. Since the latter embodies the former, and the former is part of the latter, these two categories go hand-in-hand. Much of the current literature focuses on the latter category, and, indeed, some knowledge-based regions are growing faster than others with lower aggregate knowledge levels.

The information commons, information infrastructure development programs, and advances in information-related technology industries have altered economic activities and the basic functioning of agents (consumers and producers). Antonelli (1998, p. 180) argued that “The penetration of new information and communication technologies encourage just such a trend, affecting the actual conditions of information in terms of its exchangeable parts, separating new information from the technical expertise used to generate it. New technologies provide an opportunity for business services providers to store and market knowledge, and for business services users to better access and purchase it.” Recent developments have not only increased the scale and scope of information distribution, but also have made it relatively more difficult to find and retrieve the right information. The proliferation of information along with technology development has highlighted the need of an appropriately trained labor force capable of managing and manipulating both the technology and the information thereby available. There had been a growing demand for high-skill labor in the knowledge segment of the economy. In the early 1990s much of the high-skill labor requirements were met through a mass importation of migrant workers from India and China.

Economists have always had difficulty defining the nature and scope of the knowledge-based economy. The movement and composition of industry sectors requiring highly-skilled labor makes the task of identifying this segment of the economy somewhat easier. Machlup (1962) first initiated work on defining the knowledge economy based on the intensity of the high-skill labor force and measured the knowledge intensity of different sectors in the economy. Machlup found six sub-sectors in the production sector of the economy: i) education; ii) research and development (R&D); iii) artistic creation; iv) communications media; v) information services; and vi) information technologies. Since then, knowledge-based economies have gradually grown, with some becoming dominate economic activities (Bell, 1973).

In any economy, firms play an important role as the building block of the economy and the change agent. However, in knowledge-based economies, firms play a crucial role as they (the firm) are the repository of knowledge (Nonaka and Takeuchi, 1995). Firms tend to grow faster as their repository of knowledge increases and its use in the production processes increases. In this context, Penrose (1995, p. 16) argued that "a firm's rate of growth is limited by the growth of knowledge within it." In many instances, firms consider the repository knowledge as their most valuable asset. Over the years, researches were able to develop criteria to measure the intangible nature of the knowledge in regions and in firms in particular. Recently, Sanchez et al. (2000) introduced a guideline to measure a firm's knowledge by distinguishing intangible resources, intangible activities, and having performance indicators. Then, the level of activity or stock of an identified variable of an intangible is measured (ratios or numbers). These numbers or ratios could be compared across firms, regions and economies.

Source: Cader 2008.

1.1 Concept, Types, Characteristics and Importance of Knowledge

Demands of society and the economy for highly qualified, independent and skilled labor broader scope of action and knowledge application and education. Level of investment in knowledge and education has become the dominant civilization indication of understanding modern development. Knowledge is put to the fore in all modern and advanced organizations, because the constant innovating and learning are basic for their survival. Knowledge has become a key foundation of social and economic development. It is believed that more than 50 percent of GDP in developed economies is based on the knowledge, ie. on the intellectual property and expertise of the people. In modern economies, knowledge has a key role.

Many philosophers tried to determine the concept of knowledge. One of the first was Plato, who believed that knowledge was characterized by existence of traceability, authenticity and subjective beliefs. Modern understanding of knowledge is related to the product of human contemplative activity directed to the reality understanding, which has been tested in practice and faithfully replicated in human thinking. In the knowledge economy, this is a collection of useful information, owned by specific people, as part of a product (service). Because of the

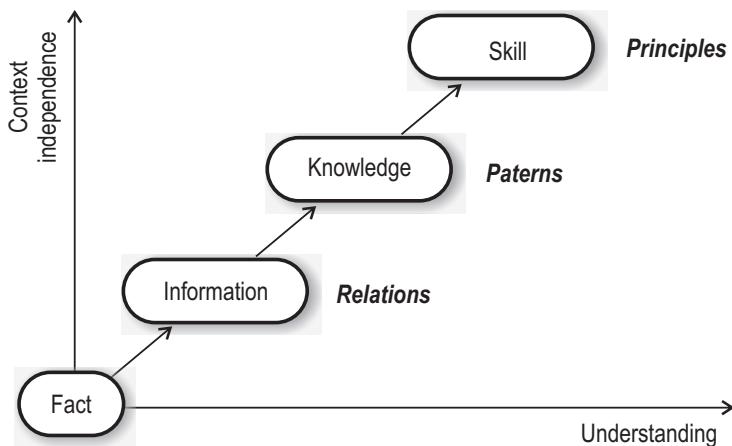
term data, information and knowledge are sometimes permuted, they must be terminologically delimited and explained. Conceptual distinction between data, information, knowledge and wisdom has been given by R. Ackoff (1989) in the “hierarchy” or so-called “pyramid of knowledge”. According to him, the human mind can be classified into five categories:

- *Data* is unorganized and unprocessed facts, which is static, does not allow judgements, does not represent a basics for action, it exists by itself without any special meaning or context. It only partially describes what's going on, without interpreting or explaining the essence of events. Data is a collection of different facts about the objects;
- *Information* is a process of giving the meaning to the data. In addition to meaning, it has a purpose, relevance and value for its recipient. Information is a hierarchical set of data on various aspects of the reality;
- *Knowledge* is a purposeful collecting the information for realization the urge to achieve its usefulness and usability. It is a deterministic process. Simple memorizing the information produce accumulated and randomly systematic knowledge. Compared to the information, knowledge is deeper and broader concept. It is a combination of wisdom, experience, education, ideas, approaches, values, contextual information, data, expert opinion, etc. creating a general framework for the evaluation and implementation of new experiences and information. Knowledge contains a general testimony about the structures, processes, phenomena and their relations. Knowledge that requires real cognitive and analytical skills, memory and reasoning power, is achieved at the stage of understanding;
- *Understanding* is a cognitive and analytical process. It allows connecting and synthesizing the knowledge with earlier acquired knowledge. The difference between understanding and knowledge is equal to the difference between learning and memorizing. Understanding connects different levels and provides the transition from one to the other. People who understand, based on connecting the new and earlier acquired knowledge, can take appropriate action and act in a rational manner; and
- *Wisdom* is above all these levels. It has a special relationship with conscience, ethics and so on. Wisdom allows to distinguish right from wrong, correct from incorrect.

Knowledge is an important element of organizational culture. It is a critical factor for sustainable development. Davenport and Prusak (2000, p. 5) treat

knowledge as a “volatile mix of experience, values, contextual information and expert opinions, which provide a framework for evaluating and incorporating new experiences and information. It is created and appears in the minds of those who do already possess knowledge. In organizations it is often embedded not only in documents and reports, but also in organizational routines, processes, practices and norms.”

FIGURE 2.3: HIERARCHY OF KNOWLEDGE



Source: Adapted from Ackoff 1989.

Knowledge has always been the basis of human progress and the source of wealth of any entity that owns it. A. Tiwana (2000, p. 63) believes that knowledge generates the relevant information available in the right form at the right time, the right place, and are essential for decision making. Knowledge can be seen through the prism of expanding the general knowledge, capabilities, skills and abilities, which allows self-determination of any individual. This provides a basis for the further development of the personality. It is believed that approximately 90 percent of the existing scope of knowledge in the world has been created in the last 30 years. OECD experts and economists B. Lundvall and B. Johnson (1994) proposed four basic types (categories) of knowledge (according to Mindeli 2007, p. 121):

- **to know - what** (*know what*) is a set of information about certain facts and refers to knowledge of facts. This type of knowledge is closest to the definition of information as a tool that can be used in production. This kind of knowledge is relatively available to the majority of entities in our society, which makes it less strategically important than the competition;
- **to know - why** (*know why*) is knowledge of the causes and rules of operating a certain processes and activities. This type of knowledge is related to scientific knowledge, which is of great importance for technological development, for example, chemical, nuclear, electronic and other industries. Adopting these skills means investing in technology development and production of "smart products" (*smart devices*), which are important for competitive strategy in the global environment;
- **to know - how** (*know how*), involves the skills and abilities to do something. This is knowledge in the form of specialized skills: entrepreneurs, scientists, computer scientists, talented individuals, etc. It is a specific kind of knowledge, which creates a specialized teams of experts, who may not be in that company, or live in a country where company is located; and
- **to know - who** (*know who*) - is knowledge of information sources and ability to establish contacts with their individual carrier, from whom the necessary expertise was obtained. It refers to the profile of professional, who is involved in some important scientific and commercial projects at the national and/or international level. In modern world prevails a tendency to the growing complexity of scientific basis, which is composed of different knowledge sources and expertise from different countries.

Interaction between individual companies, specialized in particular areas of technology is dominant today. This interaction is based on knowledge exchange and joint projects in the fields of physics, chemistry, biochemistry, medicine, biotechnology, information systems and so on. In the literature there is a dilemma regarding the dissemination of knowledge as a public good, because the know-how has never become a public good, available to all economic actors in society. In that specified frame of basic types of knowledge (*Ibid*) we should search for a proper and rational use of available national resources. Without them it is impossible to achieve the competitive advantage and sustainable economic growth and development. Knowledge has become the essential component of value. C. Meyer (1998) listed the five key features that affected the ability of the

company (organization) to compete effectively in creating value through knowledge:

- material result of intellectual labor is *public knowledge*, but the creative process has its hidden character;
- public knowledge *spreads* faster and easier on a global scale;
- after transformation into goods or services, public knowledge strongly *reduces* the value a whole basic infrastructure, necessary for sustaining competitiveness;
- all knowledge creates new knowledge and *proliferates* through its application, while material assets reduce and spend merely from the use;
- the rapid growth of knowledge substantially *aggravates* longer preservation of leadership in an area, so the global economy rewards not only creators, but imitators who know how to effectively use the knowledge.

An axiom is that a higher level of education means better and faster development of the economy, lower unemployment and longer lifespan of people. But that is not a solution for all economic problems. Production of the fundamental knowledge is concentrated in a few centers, located in five states, but the practical knowledge and their use are quickly spreading throughout the world. From the perspective of a market economy there are three major characteristics of knowledge:

- *discretion* of knowledge as a product (existing or not), where an original is expensive and a copy is cheap,
- *availability on the fly* (having a character of a public good), although it is impossible to sell all “knowledge copies”, and
- *information character* (does not disappear after consumption).

In modern information society based on knowledge (*Knowledge Based Society*) the role of education is crucial for business. Knowledge has become a key factor in economic development and competitiveness of products in the market. Knowledge and information appear in a double role: they show how much information economic agents possess in the society in which they operate, and how they are able to process that information to their advantage. Knowledge in society appears as an *asset*, but unlike physical assets, knowledge acts as an *input* (competence, skills, etc..) and as an *output* (innovation, patents etc. - Lundvall and Johnson , ibid.). The knowledge economy operates with the knowledge as the best quality good, ie as a means of production and the mode of competitive advantage in the market. In this case, knowledge may be: *used* (production process), *purchased* in the market (employment of knowledge workers, purchase of patents, etc.), and *deferred* or *archived* (libraries, databases).

Mediation of the state administration in maintaining the educational system is the rational allocation of resources in the knowledge production (Arrow, 1962, p. 67). This implies the conclusion that knowledge is a public good, where the economic agents would not be stressed out by additional demand for investment in knowledge as a competitive strategy in the market. Analyzing knowledge as an asset in the context of the knowledge economy, the question is whether the knowledge is public or private good? Public attributes are contained in the fact that the production of knowledge as education – is a public good, serving the purpose of public benefit. However, this is questionable, because the whole knowledge is not available. Thanks to an “invisible knowledge” owned by certain companies and individuals, their success is guaranteed in the market.

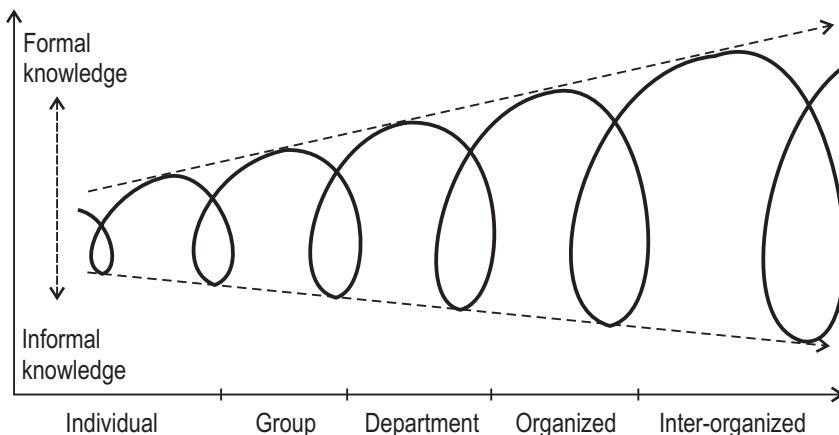
Schoetze (OECD Papers 2000, p. 169) distinguishes three types of knowledge flow: education and training, synthesis of knowledge from different disciplines, and diffusion, transfer and knowledge sharing.

Review and analysis of many knowledge definitions exceed the need and goal of this manuscript. Therefore, we will mention just a few selectively chosen characteristic determination and interpretation, which are sufficient to grasp the essence of conceptual knowledge. P. Drucker said that knowledge is ability to apply information in a particular activity. Thus, knowledge includes a set of information and skills that individuals use to solve tasks and interpret information (ideas, methods, values and norms). The principle of rationality is basis of the neoclassical market theory and the behavior of market participants. But the practice shows that the market economy is characterized by a high degree of risk, uncertainty and entropy, so the expectations of market entities often may be unrealistic. Knowledge and information minimize uncertainty and risk, or, according to K. Arrow (1995, p. 98): *“Information is a term that is directly opposed to the term uncertainty.”* They enable reliable future planning, enhance the quality of decisions and expand the horizons of market choices.

A. Toffler (1990, p. 172) believes that global society is moving towards free and open-organized information that will lead to a revolution in thinking, analyzing, synthesizing and expressing information and creative human capabilities. One of possible conceptual analysis of knowledge is a methodological approach to the relationship of knowledge and organization. There are two main aspects: *epistemological* (theory of knowledge positions) and *ontological* (the position of being, ie. existence, maintenance, construction and movement of knowledge in various structural units of the organization). In terms of *knowledge epistemology* there are two directions: *rationalism*, where human mind is a thinking process as a source of knowledge, achieved by deductive (from general to individual: con-

cepts, laws and theories that apply to individual cases) and *empiricism*, where sensory reception is a source of knowledge, realized inductively (from the particular to the general, from facts to hypotheses). In terms of *ontology knowledge*, levels of creating the knowledge appear as individual, group, department, organized and inter-organized knowledge (Figure 2.4).

FIGURE 2.4: THE PROCESS OF CREATING KNOWLEDGE - ONTOLOGY ASPECT



Source: Adapted from Glusica 2004, p. 87

Box 7- What is the Impact of Knowledge Set Free?

The most substantial changes will be felt in how we organize ourselves. The spaces and structures of society-corporations, churches and religious bodies, schools, and government-will experience a different relationship with knowledge. Instead of relationships of control/monitor and cause/effect, these organizations require a shift in view to foster, nurture, and connect. Customers, students, and clients no longer tolerate pre-packaging (music, news, media). Knowledge set free enables dynamic, adaptive, and personalized experiences.

Yochai Benkler, in his exploration of the growing prominence of networks in society, offers a glimpse into what is at stake in our world of morphing knowledge: Information, knowledge, and culture are central to human freedom and human development. How they are produced and exchanged in our society critically affects the ways we see the state of the world as it is and might

be...for more than 150 years, modern complex democracies have depended in large measure on an industrial information economy for these basic functions. In the past decade and a half, we have begun to see a radical change in the organization of information production. These changes are still being interpreted through existing beliefs of how we should structure our organizations and what it means to know and learn. How deep must change penetrate our organizations before we see systemic change? The first attempt at implementation usually involves forcing decentralized processes into centralized models.

We stand with our feet in two worlds: one in the models and structures that originated in (and served well) the industrial era, and the second within the emerging processes and functions of knowledge flow in our era today. Our dual existence is noticed in business, education, and media—we have new tools being used to serve old needs. This phenomenon was found in the early days of video. Initially, video was thought to be best suited for taping and recording live stage shows. Video was seen as a second-rate experience to live shows. Over time, once producers and editors understood the uniqueness of the medium, video developed into its own art form.

Knowledge Is Not Static

The knowledge flow cycle (see Figure B7) begins with some type of knowledge creation (individual, group, organization) and then moves through the following stages:

Co-creation ... (like end-user generated content) is a recent addition to the knowledge cycle. The ability to build on/with the work of others opens doors for innovation and rapid development of ideas and concepts.

Dissemination ... (analysis, evaluation, and filtering elements through the network) is the next stage in the knowledge-flow cycle.

Communication ... (those that have survived the of key ideas dissemination process) enter conduits for dispersion throughout the network.

Personalization ... at this stage, we bring new knowledge to ourselves through the experience of internalization, dialogue, or reflection.

Implementation ... is the final stage, where action occurs and feeds back into the personalization stage. Our understanding of a concept changes when we are acting on it, versus only theorizing or learning about it.

A simple example is the process of communicating via text. Traditionally, a book was the created knowledge object. Once written, it was released for others to read and disseminate. As an object, the flow of discussion was essentially one way—from the author to the reader (though readers may form book clubs to discuss the work of an author). The original source was not updated regularly, perhaps only in subsequent editions occurring every several years. In today's online world, an author can post a series of ideas/writings, and receive critique from colleagues, members of other disciplines, or peers from around the world. The ideas can be used by others to build more elaborate (or personalized) representations. The dialogue continues, and ideas gain momentum as they are analyzed and co-created in different variations. After only a brief time (sometimes a matter of days), the ideas can be sharpened, enlarged, challenged, or propagated. The cycle is dizzying in pace, process, and final product, which is then fed back into the flow cycle for continual iteration. We do not consume knowledge as a passive entity that remains unchanged as it moves through our world and our work.

FIGURE B7: KNOWLEDGE FLOW CYCLE

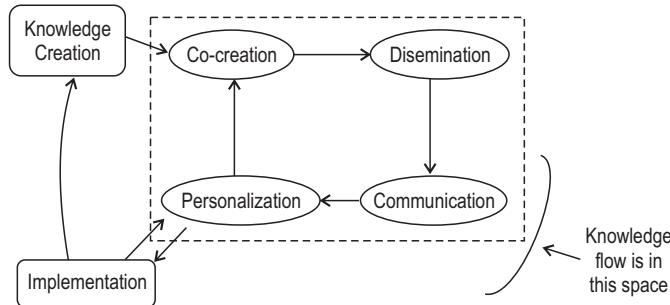
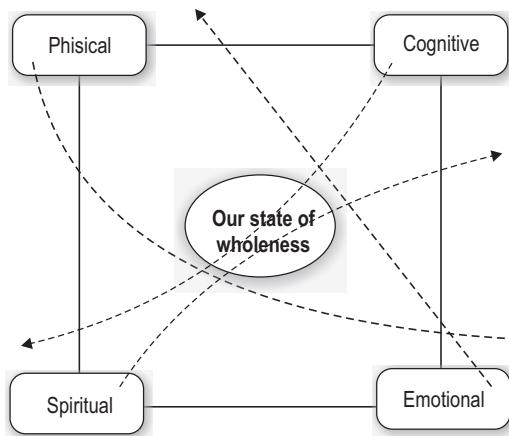


FIGURE B8: DOMAINS OF KNOWING



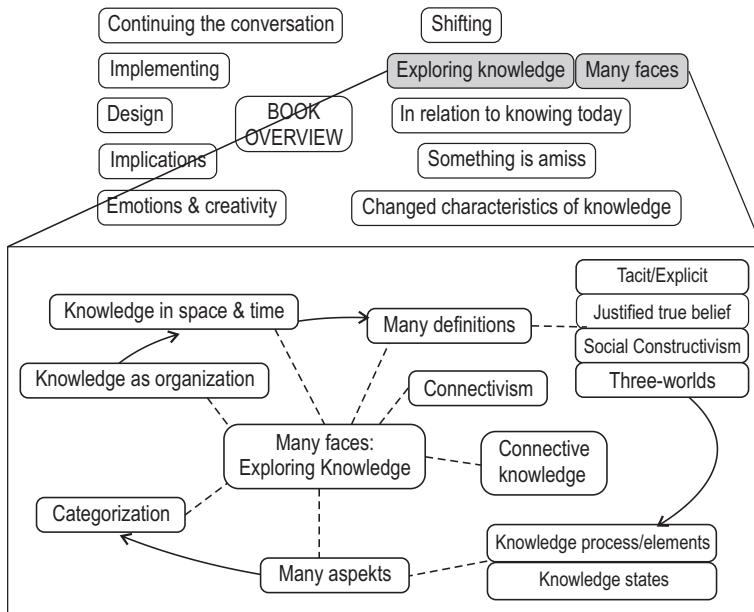
We dance and court the knowledge of others—in ways the original creators did not intend. We make it ours, and in so doing, diminish the prominence of the originator. Cognitive, emotional, physical, and spiritual domains of knowledge interact in a myriad of ways. Life is not lived in a silo. Artificial constructs may be useful for categorization, but fail to capture the true richness and inter-connectivity of knowledge. The aggregate of domains, each with various levels of prominence in different situations, provides the conduit through which we experience knowledge.

Knowledge consists of different types:

- ***Knowing About*** ... news events, basics of a field, introductory concepts in a discipline,
- ***Knowing To Do*** ... drive a car, solve a math problem, code a program, conduct research, manage a project,
- ***Knowing To Be*** ... to embody knowledge with humanity (doing blended with consistency and daily existence), to be a doctor or psychologist (mannerism, professionalism), to be an ethical person, to be compassionate, to relate, to feel,
- ***Knowing Where*** ... to find knowledge when needed, web search, library, database, an organization, and increasingly, knowing who to approach for assistance,
- ***Knowing To Transform*** ... to tweak, to adjust, to recombine, to align with reality, to innovate, to exist at levels deeper than readily noticeable.

The quad-space of self occurs in the larger space of organizations and society; just as we exist in different domains: physical, cognitive, social, and spiritual (see Figure B), we exist in different spaces: self, collective, organizational, and societal (see Figure C). Each space of existence holds its own culture. Knowledge experienced in the space of self holds a different context (and thereby, meaning) than knowledge experienced in our collective spaces (hobbies, volunteer groups, social spaces).

FIGURE B9: WHAT IS KNOWLEDGE



Source: Siemens 2006.

1.2 Innovations

Improvement of existing and introduction of new products can be achieved through systematic continuous implementation of innovation and learning and in companies. Innovation³ in the knowledge economy is not only the process of creating new products, but the element of production and other business processes. Enterprise fails without innovation. Knowledge and effective management of organizational knowledge encourages creativity of employees, which is accomplished through a variety of innovations. The ability to innovate is one of the major factors of change and success. Therefore, the innovation is necessary for the survival and vitality of the company, the national economy and society as a whole. In the knowledge economy, competitive advantage is based on knowledge and utilization of the opportunities necessary for the exploitation. Management increasingly recognizes that continuing education and training of employees is one of the most effective ways to achieve competitive advantage, a fundamental assumption entering the competition for the affection and trust of consumers. It becomes a *sine qua non*, not only for further development, but also for the company survival.

From economic point of view, modern companies enable more efficient use of knowledge by acquiring and improving competitive advantage as a condition of development. This is reflected in an implementation of innovation. Also, the time required for their practical application is reduced. Naturally, knowledge can not be transplanted, but it can be acquired. *Economist Intelligence Unit* (EIU) has developed the Innovation Index in 2007, according to which 82 states have been ranked on the basis of their innovative capacity measured in the period 2002-2006. Japan, Switzerland and Finland are at the top of the list, Serbia, India and Romania are at the bottom.

³ Definitions of innovation: “*The three stages in the process of innovation: invention, translation and commercialization.*” (B. D. Merrifield. 1986); “*The literature on organizational innovation is rich in lessons...describes processes that are also prevalent in the natural universe. Innovation is fostered by information gathered from new connections; from insights gained by journeys into other disciplines or places; from active, collegial networks and fluid, open boundaries. Innovation arises from ongoing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated anew from connections that weren't there before.*” (M. J. Wheatley); “*To explain innovation, we need a new theory of organizational knowledge creation....The cornerstone of our epistemology is the distinction between tacit and explicit knowledge...the key to knowledge creation lies in the mobilization and conversion of tacit knowledge.*” (I. Nonaka & Takeuchi).

Innovation is a change in principle. But every change does not constitute innovation. Changes are happening all the time, but innovations are very rare compared to the number of changes. For example, recruitment of new members is a certain change for the organization, as well as receiving a new check, but that is not innovation. Innovation relates only to the new, useful and good implemented idea. Only responses that contain something new, mobilizing creative energy and related to the important challenges (changes) in the environment can be defined as innovation. In this sense, innovations (process, technology, organizational, management, marketing) are often associated with entrepreneurship, since they are its main function, and can be seen as a "rebellion" against the existing situation (Pokrajac 1997, p. 106).

FIGURE 2.5: ESSENCE OF INNOVATION



Innovation can be defined and viewed as a *strategic response* to strategic change (challenge), because it is about acceptance and implementation of a new solutions for old problems. It is defined as a useful creation and realization of new ideas in the field of organization, behavior, design, quality, new products, technology and the like. Therefore, innovation is successful operationalization (use) of new ideas. In most cases, the relationship between creation (basic innovation) and its imitation is by far in favor of the latter.

Innovation is based on a multidisciplinary, synthesized and complex knowledge. They are the result of research-development projects with scientific character. Strategic innovation is characterized by the ability to change the established rules in the specific branch, environment or market segment. As a part of strategy that leads to success and prestige, innovation is:

- a way to do something not only different, but better than others,
- initiating the ideal response to the change (challenge), where innovation appears without any change, so the challenge is actually a need and desire for something new and original that will bring success,
- supporting the need for innovation, and
- implementing innovation into practice.

On an example of different countries, M. Porter (1993, p. 630) has demonstrated a direct dependence of innovation and creating competitive advantage, and thus improving the overall position of the organization. There is a general rule that strategic innovation leads to the creation of competitive advantage in the market. Different organizations have different innovation capacities, so that greater innovation capacity leads to creating a greater competitive advantage.

P. Drucker (1991, p. 62) has pointed out the causes of innovation:

- *the unexpected success,*
- failure and external event,
- *the incongruity between the current and normative reality,*
- *the need caused by certain process,*
- *changes in the structure of the economy and/or market,*
- *demographic trends,*
- *changes in perceptions and meanings, and*
- *new scientific and other knowledge.*

Managing the innovation is an important element of strategic management, which focuses on the restructuring of organizations (companies) in terms of responding to strategic changes. Contemporary conditions of business and the dynamics of knowledge impose the need for detecting changes in the environment and timely adjustment to them. As an organized, systematic, and rational response to changes, innovation is a specific tool of entrepreneurs in a ruthless market competition (Drucker 1985, p. 19). Innovation Management as a new concept SM finds in a fact that the changes are permanent and dynamic categories, the key characteristic of turbulent business environment. P. Petrovic (2000, p. 41) points out that this concept includes:

- detecting and implementing the changes in an organizational structure,
- introducing the changes in a product and market strategy,
- changing the business strategy development,
- changing the method of management,
- changing the method of using the human and other resources,
- introducing and using the knowledge,
- training of employees and others.

For the Innovation Management T. Peters (1990, p. 21) suggests the following *courses of action*:

- abandoning the hierarchical and forming the so-called “shallow” organizational structure,
- abandoning the centers and branches concept, and creating flexible partnerships with suppliers and distributors,
- removing the functional barriers in the organization,
- continuous learning and improving should be the style of life and business,
- introducing the information technology if necessary,
- rationalizing their time,
- internal competition among organizational units, a revolution in design, quality and service,
- accepting the values and benefits of globalization, taking into account and using the changes, and
- accepting the strategies that are not ready for the experiment, nor suitable in a turbulent environment.

Strategy for stimulating innovative ideas is being implemented in three phases: a) *generating ideas* (defining the areas of searching, finding ideas, creating, viewing and testing ideas), b) *accepting ideas* (examining and testing ideas, deciding on accepting ideas), and c) *realizing ideas* (distributing ideas to interested parties, the actualizing ideas, evidencing the effects – according to: Petrovic, 2000, p. 44). It is believed that intuition, experience, knowledge and reality in the quality combination are the best components for the realization of entrepreneurial ideas and innovations. One component without another does not create an opportunity, does not solve problems, does not identify hazards, does not examine the range of business decisions and does not create innovations. An innovative company accepts that there is always a better way of doing business, searching for new ideas to reduce costs and to enhance opportunities for creating innovation, new values and the resulting profit.

Box 8 - The Innovation Death Spiral

Far too many companies are now finding themselves trapped in a phenomenon we will refer to as the “innovation death spiral.” The spiral begins when a company’s new products, developed and launched with high hopes, end up yielding only disappointing results. Nonetheless, once those products are out in the field, they soak up valuable resources, including manufacturing and purchasing capacity, marketing budgets, warehouse space, back office systems and management attention. So the company has fewer resources to invest in other initiatives that may prove more

successful, including the bold, truly game-changing innovations that alone can provide sustainable competitive advantage and fuel profitable growth. As a result, the company is constrained to limit its investments to “safer,” merely incremental extensions of existing products and services, which again prove disappointing and absorb undue resources, accelerating the downward spiral. Moreover, once the company is perceived as less than innovative, it suffers both strategically and operationally. For companies caught in this spiral, increasing innovation budgets only make things worse by putting more non-differentiating products out into the market.

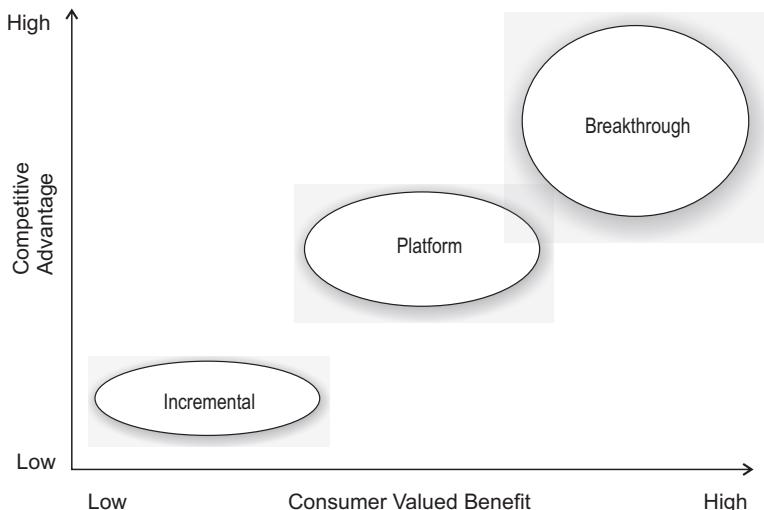
Meanwhile, in contrast, companies that take a bolder, more balanced, and more far-sighted approach to innovation are on the opposite trajectory: becoming a high-performing organization. They trace a virtuous cycle in which a balanced portfolio of successful innovations—including incremental, platform, and sometimes breakthrough innovations—reinforces customer loyalty; wins new buyers; grows the market; attracts valuable suppliers, partners, investors, and employees; and generates lots of cash, which the company can then invest in even more exciting innovation. It is now clear that the gap between these two kinds of companies—the ‘innovation challenged’ and the ‘innovation savvy’—is inexorably widening.

For companies in the first category to break out of the innovation death spiral, it is essential to understand very clearly what is going on, and then to make critical interventions and radical changes in the way the company operates. Here, we first set the stage by defining the three main kinds of innovation, then lay out the characteristics of the innovation death spiral, how companies get trapped in it, and the approach they need to make to transition to the upward spiral. Accenture distinguishes among three main types of innovation: incremental, platform, and breakthrough (see Figure B10). Innovations in these three categories deliver different benefits in terms of consumer value and competitive advantage. Ideally, companies should maintain balanced portfolios that contain, at a minimum, both incremental and platform innovations. The pursuit of breakthrough innovations requires acquiring or developing breakthrough-specific capabilities and therefore requires a significant strategic decision and commitment.

Incremental innovation. These are “running to stand still” innovations. Because they do not offer customers superior benefits, they don’t create additional demand for the company’s products. Nonetheless, incremental innovation plays a necessary role in defending the company’s baseline against competition; it can be seen as a form of maintenance, more renovation than innovation. Many consumer goods companies spend over half their innovation budgets on incremental innovations, generally because they lack the ability to systematically scan the market for the most attractive opportunities and develop winning ideas to capitalize on them.

Platform Innovation. These are “share of market” innovations. By delivering superior customer benefits, they drive some market growth, often in terms of heightened value thanks to premium pricing rather than in terms of expanded volume. But their main function is to grow the innovator’s market share by giving customers a reason to switch from a competitor brand. Companies that create platform innovations must be sure to secure sustainable competitive advantage through brand, technology, customer lock-in, etc. Examples of platform innovations are Vanish and Coke Zero, both of which drove some market growth but primarily increased their innovators’ share of market.

FIGURE B10: COMPETITIVE INNOVATION MATRIX



Breakthrough Innovation. These are market-changing innovations. By delivering new benefits to customers, they create a new market that the innovator can dominate for some time. A common misunderstanding is that breakthrough innovations are necessarily large technological inventions. In fact, breakthrough innovations often use existing technology in novel business models. Innovators need to establish firm protection for their large investments in this type of innovation. A successful breakthrough innovation is of course Apple's iPad. An example of a breakthrough innovation that was not adequately patented is Senseo coffee pads by Sara Lee, where competitors were quickly able to start selling cheaper pods, undercutting Sara Lee's potential market.

Source: <http://www.google.me/url?sa=t&rct=j&q=&esrc=s&source=web&cd=11&ved=CCYQFjAAOAo&url=http%3A%2Fwww.accenture.com%2FSiteCollectionDocuments...>

Box 9 - Innovation Models

Technological and commercial innovation is central to the policy debate on the future of Europe in an era of globalization and fiscal and demographic constraints. Little attempt has been made in the business and policy communities to systematically draw on the concepts, theories and empirical evidence that have been developed over the past three decades of innovation studies in order to improve the overall climate for innovation. In this paper we review the different models of the innovation process. We draw heavily upon recent reviews of technological innovation (Tidd, 2006),

organizational innovation (Isaksen and Tidd, 2006), and attempts to synthesize technological, organizational and commercial aspects of the innovation process (Tidd, Bessant and Pavitt, 2005). We begin with an assessment of the limitations of the more conventional linear technology-push models, and track the evolution to the more recent and realistic dynamic models of innovation that feature a network of actors, sources and constraints. This latter perspective more readily reveals some of the negative implications of a partial, disaggregated view of the innovation process. In particular, it suggests that a focus on improving the science base and novel technological innovation is insufficient, because many problems occur during the later stages of the innovation process, in terms of development and diffusion.

Next we consider ways to apportion the costs and benefits of innovation, and the incentives and constraints that exist at the level of the firm and the economy. We consider the balance between incremental and more radical forms of innovation, and the different stakeholders they might serve. The importance of an understanding of innovation as a process is that it shapes the way in which we try and manage it. This understanding has changed a great deal over time. Early models (both explicit and, more importantly, the implicit mental models whereby people managed the process) saw innovation as a linear sequence of functional activities. Either new opportunities arising out of research gave rise to applications and refinements which eventually found their way to the marketplace ('technology push'), or else the market signaled needs for something new which then drew out new solutions to the problem ('need pull', where necessity becomes the mother of invention). The limitations of such an approach are clear; in practice innovation is a coupling and matching process, where interaction is the critical element. Sometimes the 'push' will dominate, sometimes the 'pull', but successful innovation requires an interaction between the two.

One of the key problems in managing innovation is to make sense of a complex, uncertain and highly risky set of phenomena. Much recent work recognizes the limits of linear models, and tries to build more complexity and interaction into the frameworks. Most innovation is messy, involving false starts, recycling between stages, dead ends, and jumps out of sequence. In an important programme of case study-based research looking at widely different innovation types, van de Ven and colleagues (2000) explored the limitations of simple models of the process. They drew attention to the complex ways in which innovations actually evolve over time, and derived some important modifiers to the basic model:

- Shocks trigger innovations - change happens when people or organizations reach a threshold of opportunity or dissatisfaction,
- Ideas proliferate - after starting out in a single direction, the process proliferates into multiple, divergent progressions,
- Setbacks frequently arise, plans are overoptimistic, commitments escalate, mistakes accumulate and vicious cycles can develop,
- Restructuring of the innovating unit often occurs through external intervention, personnel changes or other unexpected events,
- Top management plays a key role in sponsoring - but also in criticizing and shaping – innovation,
- Criteria for success shift over time, differ between groups, and make innovation a political process,
- Innovation involves learning, but much of the outcome is due to other events which occur as the innovation develops - often making learning 'superstitious' in nature.

Roy Rothwell was for many years a key researcher in the field of innovation management, working at SPRU at the University of Sussex. In one of his later papers, he provided a useful historical perspective on innovation management, suggesting that our appreciation of the nature of the innovation process has evolved from simple linear models (characteristic of the 1960s) to increasingly complex interactive models (Table B 1). His 'fifth-generation innovation' concept sees innovation as a multi-actor process, which requires high levels of integration at both intra- and inter-firm levels, and which is increasingly facilitated by IT-based networking.

TABLE B1: PROGRESS IN CONCEPTUALIZING INNOVATION: ROTHWELL'S FIVE GENERATIONS OF INNOVATION MODELS

Generation Key features

First and second	The linear models - need pull and technology push
Third	Interaction between different elements and feedback loops between them – the coupling model
Fourth	The parallel lines model, integration within the firm, upstream with key suppliers and downstream with demanding and active customers, emphasis on linkages and alliances
Fifth	Systems integration and extensive networking, flexible and customized response, continuous innovation

Source: Adapted from Tidd, Bessant and Pavitt, 2005.

The models of innovation we have been reviewing so far are very much about the world of repeated, continuous innovation where there is the underlying assumption that we are 'doing what we do, but better'. This is not necessarily only about incremental innovation - it is possible to have significant step changes in product/service offering, process, etc. - but these innovations still take place within an established framework. The 'rules of the game' in terms of technological possibilities, market demands, competitor behaviour, political context, etc. are fairly clear. Although there is scope for pushing the limits, the space within which innovation happens is well defined. But we also need to take into account that innovation is sometimes *discontinuous* in nature. Things happen which lie outside the 'normal' frame, and result in changes to the 'rules of the game.'

Table B1 lists potential sources for such disruptions. Under these conditions, doing more of the same 'good practice' routines may not be enough, and may even be inappropriate, to deal with the new challenges. Rather, we need a different set of routines - not to use instead of, but in addition to, those that we have developed for 'steady state' conditions. In their pioneering work on this theme, Abernathy and Clark (1985) developed a model describing the pattern in terms of three distinct phases. Initially, under discontinuous conditions, there is what they term a 'fluid phase' during which there is high uncertainty along two dimensions:

- The target - what will the new configuration be and who will want it?
- The technical - how will we harness new technological knowledge to create and deliver this?

Competencies in Production and Research

Local demand opportunities and competitive pressures will not result in innovation unless firms have the competencies that enable them to respond. Corporate and national competencies in *production* and in *research* are essential. National competencies in *research* are also an important input into firms' technological capabilities. Especially in large firms, R&D laboratories actively seek support, knowledge and skills from national basic research activities like those in universities. The knowledge they seek is mainly tacit and person-embodied, which explains why language and distance are real barriers to cooperation, and why the firms generally prefer to deal with domestic universities. These differences in national endowments of research and production competencies influence managers in their search to identify technological fields and related product markets where specific national systems of innovation are likely to be most supportive to corporate innovative activities. For example, firms in the UK and US are particularly strong in software and pharmaceuticals, both of which require strong basic research and graduate skills, but few production skills; they are therefore particularly well matched to local skill structures.

In many countries, national advantages in natural resources and traditional industries have been fused with related competencies in broad technological fields that then become the basis for technological advantage in new product fields. Firm-specific investments in technology and related basic research and training in universities led to the mastery of broad technological fields with multiple potential applications: metallurgy and materials in Sweden, machinery in Switzerland and Sweden, and chemistry and (more recently) biology in Switzerland and Denmark. Innovation involves attempts to deal with an extended and rapidly advancing scientific frontier, fragmenting markets flung right across the globe, political uncertainties, regulatory instabilities, and a set of competitors who are increasingly coming from unexpected directions. Thus, spreading the net wide and trying to pick up and make use of a wide set of knowledge signals is what is needed for effective management of innovation - in other words, learning to manage innovation at the *network* level.

This is something which Roy Rothwell foresaw in his pioneering work on models of innovation, with a gradual move away from thinking about (and organising) a linear science/technology-push or demand-pull process, to one which saw increasing *inter-activity* - first across the firm with cross-functional teams and other boundary-spanning activities, and then outside the firm and its links with others. There is now a recognition that networks may not simply be one end of the traditional spectrum between doing everything in-house (vertical integration) and of outsourcing everything to suppliers (with the consequent transaction costs of managing them). It is possible to argue for a 'third way,' which builds on the theory of systems and the theory that networks have emergent properties - the whole is greater than the sum of its parts. This does not mean that the benefits flow without effort - on the contrary, unless participants in a network can solve the problems of co-ordination and management, they risk being suboptimal. But there is growing evidence of the benefits of networking as a mode of operation in innovation. Even the biggest and most established innovators are recognising this shift. Procter and Gamble spend around 2 billion US dollars each year on what used to be termed R&D - but these days, they use the phrase 'Connect and Develop' instead, and have set themselves the ambitious goal of sourcing much of their ideas from outside

the company. As Nabil Sakkab, Senior Vice President of Research & Development commented recently, “*The future of R&D is C&D - collaborative networks that are in touch with the 99% of research that we don't do ourselves. P&G plans to keep leading innovation and this strategy is crucial for our future growth*”. Similar stories can be told for firms like IBM, Cisco, Intel - examples of what Henry Chesborough (2003) calls the move towards ‘open innovation’ where links and connections become as important as the actual production and ownership of knowledge.

TABLE B2: TYPOLOGY OF INNOVATION NETWORKS TYPE OF INNOVATION PRIMARY PURPOSE / INNOVATION TARGET NETWORK

New product or process development consortium	Sharing knowledge and perspectives to create and market new product or process concept - for example, the Symbian consortium (Sony, Ericsson, Motorola and others) working towards developing a new operating system for mobile phones and PDAs.
Sectoral forum	Shared concern to adopt and develop innovative good practice across a sector or product market grouping - for example, in the UK the SMMT Industry Forum or the Logic (Leading Oil and Gas Industry Competitiveness), a gas and oil industry forum.
New technology development consortium	Sharing and learning around newly emerging technologies – for example, the pioneering semiconductor research programmes in the US and Japan.
Emerging standards	Exploring and establishing standards around innovative technologies - for example, the Motion Picture Experts Group (MPEG) working on audio and video compression standards.
Supply chain learning	Developing and sharing innovative good practice and possibly shared product development across a value chain - for example, the SCRIA initiative in aerospace.
Cluster	Regional grouping of companies to gain economic growth through exploiting innovation synergies.
Topic network	Mix of firms companies to gain traction on key new technology.

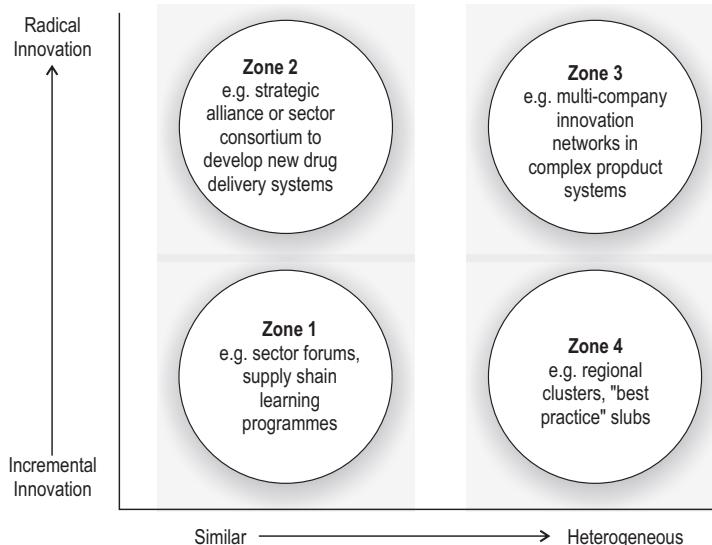
Source: Adapted from Tidd, Bessant and Pavitt, 2005.

The importance of such networking is not simply firm to firm - it is also about building rich linkages within the national system of innovation. Government policy to support innovation is increasingly concerned with enabling better connections between elements - for example, between the many small firms with technological needs, and the major research and technology institutes,

universities, etc. which might be able to meet these needs. There is an increasing trend towards trying to build innovation networks in a purpose-built fashion into what some researchers call "engineered" networks (Conway and Stewart, 2006). The purpose might be to create a completely new product or process by bringing together radically different combinations of knowledge, or it could be a network whose members are simply geared toward adopting and embedding innovative ideas. Players could be linked together by some geographical focus - as in a cluster - or as part of a supply chain trying to develop new ideas along the whole system. What they share is the recognition that they can get traction on some aspects of the innovation problem through networking. Table B2 a provides an outline typology of this process.

Whatever the purpose for setting it up, actually operating an innovation network is not easy - it needs a new set of management skills, and it depends heavily on the type of network and the purposes it is set up to achieve. For example, there is a big difference between the demands for an innovation network working at the frontier, where issues of intellectual property management and risk are critical, and one where there is an established innovation agenda, as might be the case in using supply chains to enhance product and process innovation. We can map some of these different types of innovation network on to a simple diagram which positions them in terms of (i) how radical the innovation target is with respect to current innovative activity, and (ii) the similarity of the participating companies (Figure B11).

FIGURE B11: DIFFERENT TYPES OF INNOVATION NETWORKS



Source: Adapted from Tidd, Bessant and Pavitt, 2005.

Different types of networks have different issues to resolve. For example, in zone 1 we have firms with a broadly similar orientation working on tactical innovation issues. Typically, this might be a cluster or sector forum concerned with adopting and configuring 'good practice' in manufacturing. Issues here would involve enabling networks to share experiences, disclose information, develop trust and transparency and build a system level sense of shared purpose around innovation.

Zone 2 activities might involve players from a sector working to explore and create new product or process concepts - for example, biotechnology/pharmaceutical networking around frontier developments in genomics, and the need to look for interesting connections and synthesis between these adjacent sectors. Here, the concern is exploratory and challenges existing boundaries. But it will rely on a degree of information sharing and shared risk-taking, often in the form of formal joint ventures and strategic alliances.

In Zones 3 and 4, the players are highly differentiated and bring different key pieces of knowledge to the party. Their risks in disclosing can be high, so ensuring careful IP management and establishing ground rules will be crucial. At the same time, this kind of innovation is likely to involve considerable risk, so putting in place risk and benefit sharing arrangements will also be critical. For example, in a review of 'high value innovation networks' in the UK, researchers from the Advanced Institute of Management Research (AIM, 2004) found the following characteristics were important success factors: a) Highly diverse: network partners from a wide range of disciplines and backgrounds who encourage exchanges about ideas across systems; b) Third-party gatekeepers: science partners such as universities but also consultants and trade associations, who provide access to expertise and act as neutral knowledge brokers across the network, and c) Financial leverage: access to investors via business angels, venture capitalists firms and corporate venturing which spreads the risk of innovation and provides market intelligence.

Proactive management: participants regard the network as a valuable asset and actively manage it to reap the innovation benefits.

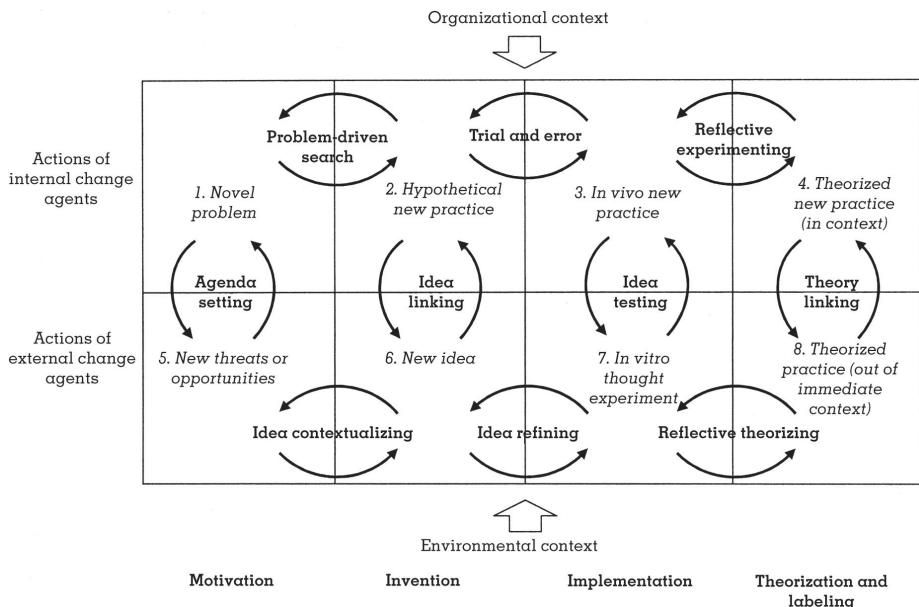
Source: Tidd 2006.

Box 10 - Management Innovation

Management innovation involves the introduction of novelty in an established organization, and as such it represents a particular form of organizational change. In its broadest sense, then, management innovation can be defined as *a difference in the form, quality, or state over time of the management activities in an organization, where the change is a novel or unprecedented departure from the past*. The framework, illustrated in Figure A, has two dimensions. The horizontal dimension consists of four phases of the innovation process: (1) *motivation* is concerned with the facilitating factors and precipitating circumstances that lead individuals to consider developing their own management innovation; (2) *invention* is an initial act of experimentation out of which a new hypothetical management practice emerges; (3) *implementation* is the technical process of establishing the value of the new management innovation *in vivo* (i.e., in a real setting); and (4) *theorization and labeling* is a social process whereby individuals inside and outside the organization make sense of and validate the management innovation to build its legitimacy. As per the vertical dimension in Figure 12, we expect two groups of individuals to shape the process:

(1) *internal change agents*, who are the employees of the innovating company proactive in creating interest in, experimenting with, and validating the management innovation in question, and (2) *external change agents*, who, similar to Guillen's (1994) management intellectuals and Abramson and Fairchild's (2001) idea entrepreneurs, are independent consultants, academics, and gurus proactive in creating interest in, influencing the development of, and legitimizing the effectiveness and retention of new management practices.

FIGURE B12: MANAGEMENT INNOVATION PROCESS FRAMEWORK



Source: Hamel 2008.

As suggested earlier, we expect external change agents to play a major role in management innovation because they provide legitimacy and expertise in many different phases of the process. They can give credibility to the original idea that sparks off the experiment inside the company, they can act as sounding boards or action researchers alongside the internal team during the implementation phase, and they can play a role in theorizing about and labeling the innovation. Figure B 12 identifies the ten core activities (indicated by the double arrows and text spanning the boxes) and the nature of the innovation or its constituent parts (indicated by the numbered text within each box). Figure B 2.5 also indicates the important role of context in shaping management innovation. Organizational context is the administrative and social mechanisms that management

can manipulate to shape the behaviors of actors in the organization, and will have a direct impact (positive or negative) on the ability of internal change agents to pursue the core activities associated with management innovation. Environmental context is the broad set of stimuli—exogenous to the focal organization—that shapes the management discourse and thereby influences the priorities and efforts of external change agents as they engage with organizations. While these two aspects of context potentially influence all activities associated with management innovation, we discuss them in detail only in those places where their role is critical.

1.3 Process of Innovation

All the rules have changed. The new management rule stands for customization, cross-functional integration, staff training and individual work teams. If a company has a shape and structure, ie. particular organization of resources, processes and relationships with the environment, the output of any serious innovative initiative is a change in that shape and structure. Ground for the future will be created by improving knowledge, teamwork and processes.

Changing the way people think about organizations requires a radical change of mind for all of us. Because there is a change in organizational balances and results, ranging:

- from certainty of acceptance of complexity and diversity,
- from “manual” work to “mental” work, from overemphasized importance of organizational structure to accepting the importance of organizational processes,
- from observing the organization as fixed, rigid hierarchies to looking at it as a complex learning system,
- from strong need for multi-level management to the acceptance of self-governed teams that can function without a superior management,
- from focusing on separate functional groups to adopting an integrated labor, as well as thoughts, and
- feelings of helpless employees who are physically “trapped” to their activities as valuable members of the organization, willing and capable to continuously learn and improve.

Nonaka has convincingly demonstrated that knowledge is necessary for the company so it could convert tacit knowledge to codified or explicit knowledge, to become more innovative and productive. When knowledge becomes explicit, it

is easier to store, transfer and repose it. D. Teece, in his study "The role of the company structure and industrial context" (1999), has described some of the structural issues related to the migration of the competitive advantages, from tangible assets to intangible assets.

In the global economy, intangible capital is the most powerful. Besides its protection from the dangers of reconstruction, companies need to focus on generating, acquiring, transferring and combining knowledge in order to meet demands of consumers. To succeed, the company must have a number of features, including: flexible boundaries, favoring alliances, *outsourcing*, powerful initiative, encouraging aggressive response to competitive developments, unbureaucratic decision making (decentralization) or shallow hierarchies - both to facilitate quick decision making and information flow from the market to the decision makers, innovative and entrepreneurial culture (which favors rapid responses and treasures specialized knowledge). Modern corporation, after accepting the challenges of the new knowledge economy, must evolve towards knowledge generation, knowledge integration and organization of protecting that knowledge (Teece, 1999, p. 23).

What is the value of knowledge? P. Strassman (1980, p. 44) made a startling observation: "As individuals, researchers at Xerox Palo Alto Research Center (PARC) were respected as the best of its time. Years later, they encouraged the creation of a series of multimillion worth enterprises. However, as employees, their contribution to the capital of knowledge, while working for Xerox, was zero, possibly negative." He (Ibid, p. 12) investigated what it is the value of the employee: "It's not about how much the workforce is paid or how many computers are given to employees, but how the organization contributes to the transformation of latent capacity in economic value. Knowledge capital is a reflection of how the organization integrates employee talents, customer needs, supplier skills to adapt to external conditions."

To prove this, he calculated the knowledge capital per employee in five pharmaceutical companies, chosen for their practicality and similarity (in size, employing people with similar qualifications, are located in areas with similar socio-economic structure, the researchers obtain their information from the same sources, try to meet the needs of similar groups of clients, subject to the same regulatory requirements, have access to the same technology and computing, work in similar production processes). Strassman has calculated that *Merck&Co* had the knowledge capital per employee worth \$1,423,916, but *Warner-Lambert* had only \$261,847. Between these two extremes were *Glaxo Welcome* with \$784,215, *Abbott Laboratories* with \$702,468 and *Johnson&Johnson* with \$

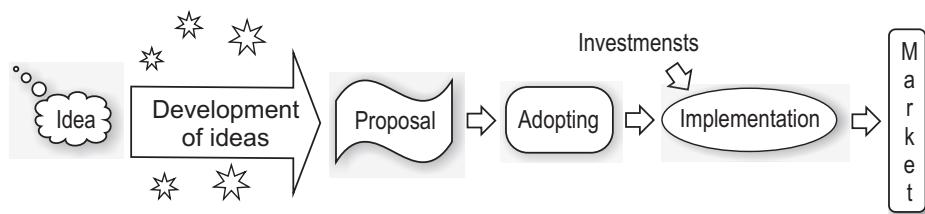
562,568. He explained the observed difference by the fact that “*knowledge capital was the way of organizing extract knowledge from information resources.*”

What the companies do to manage knowledge and what they consider the biggest barriers they face in their efforts? Center for business information of the company *Ernst&Young* conducted in 1977 a study of 3,431 American and European organizations. The team that conducted the study suggested eight major categories of activities focused on knowledge:

- generating new knowledge,
- access to valuable knowledge from external sources to use available knowledge in decision making,
- embedding knowledge in processes, products and/or services,
- representing knowledge in documents, databases, and software,
- facilitating the development of knowledge through culture and initiative,
- transfer of existing knowledge to other parts of the organization,
- measuring the value of knowledge assets and/or the impact of knowledge management, and
- facilitating the knowledge creation and distributing in the physical environment.

R. Ruggles (1998, p. 5) points out that the summary of this study provides some valuable insights: “*Interviewed managers did not have a high opinion of the company performance in any of given categories. Only 13 percent believed that they were skilled in transferring the knowledge, shared with other parts of organization. Even the ‘generating the new knowledge’ as a process, in which the managers had the most confidence when it comes to organizational skills, had a rating above average in less than half of the interviewees (46 percent). However, 94 percent of managers agreed that it was possible to set the knowledge existing in the organization to a higher level, through better management.*”

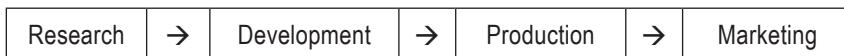
FIGURE 2.6: THE PROCESS OF INNOVATION



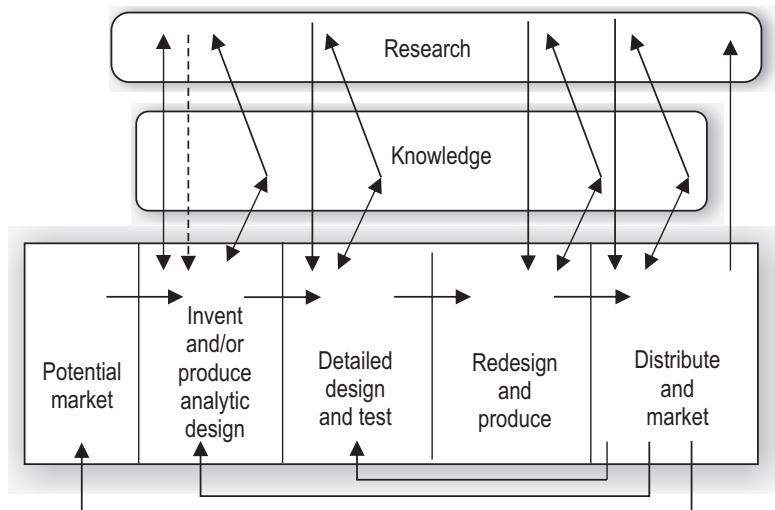
D. Lajovic and others (2012, p. 139) state that the process of innovation runs in three steps: a) *invention* - conceiving new ideas, creating conditions and opportunities for a new product, service and/or process, mainly using the technical criteria, b) *innovation* - market confirmation of invention, or introduction of new ideas into general use, where technical criteria is replaced with commercial, and c) *diffusion* – subsequent mass application of innovation, which leads to a standardization of products (imitations, improvements, etc.).

FIGURE 2.7: MODELS OF INNOVATION

The Linear Model of Innovation



Chain-Link Model of Innovation



Source: Klein & Rosenberg 1986, According from OECD 1996, p. 15

Furthermore, D. Lajovic and V. Vulic (2012, p. 61) suggest the definition of P. Trott: "*Innovation is the process of transforming ideas into practical application,*" modeling it as follows:

innovation = theoretical concept + technical invention + commercial exploitation.

This is a organizational-structural approach to innovation. It differs from the philosophical-economic views, which implies a major part of the enterprise, its essence, incarnation of knowledge, as well as elementary factor and condition of competitive advantage. The linear model of innovation has emerged through changes of the network characteristic of the knowledge-based economy (Figure 2.7). The innovation in traditional theory was observed as a process of discovery which proceeds via a fixed and linear sequence of phases.

In the linear model, innovation begins with new scientific research, progresses sequentially through stages of product development, production and marketing, and terminates with the successful sale of new products, processes and services. In this view, ideas for innovation can stem from new manufacturing capabilities and recognition of market needs, and many other sources. Innovation can appear in many forms, for example: incremental improvements to existing products, applications of technology to new markets and uses of new technology to serve an existing market. Process of creating innovation isn't completely linear. Communication among different actors - firms, laboratories, academic institutions and consumers - is necessary - as well as feedback between science, engineering, product development, manufacturing and marketing.

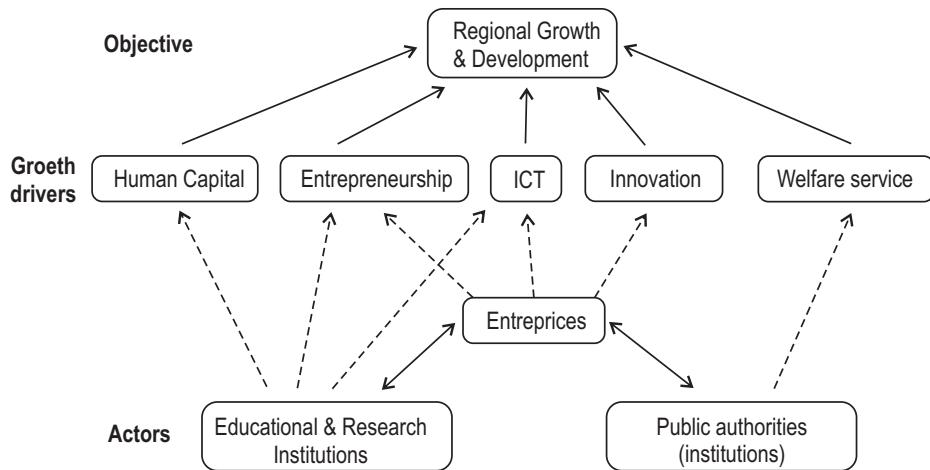
1.4 Innovations and Knowledge Economy

Companies and society treat knowledge like an asset, but unlike physical asset knowledge is treated both as *input* (competency, skill etc.) and *output* (innovations, patents etc.). In the knowledge economy innovations are not only process of creating new products, but as well an element of production and other business processes. A company is either innovating or disappearing. Employees' creativity and efficient usage of knowledge is achieved through different innovations. Capability to innovate is one of the crucial factors of change and business success. For these reasons innovations are essential for survival and vitality of companies, national economies and society as whole.

Intellectual capital is main trigger of innovations and competitive advantage in modern knowledge economy. It is a source of strategic and competitive advantages in an organization. It is based on structured knowledge and skills

as intellectual potentials that an organization can use and which through the creation of added value (capitalization) can be easily transformed into a new economic good. Primary purpose of human capital is innovation, both in case of a new product or a service or improvement of business process. Innovations are having destabilizing effect on organizational routine. They change structural capital and re-create it so it suits new situations and relations. In the knowledge economy the role of intellectual component in the capital is constantly increasing. Structure of the knowledge economy is consisted of human capital, ICT, innovations etc. (Figure 2.8).

FIGURE 2.8: MODEL OF SUSTAINABLE DEVELOPMENT STRUCTURE IN THE KNOWLEDGE ECONOMY



Source: Cornett, 2009, p. 405.

Factors that are influencing regional development found in the existing literature are shown in Figure 2.8. As it can be seen regional development is influenced by a number of driving forces like availability and access to human capital, the level and speed of innovation, the presence of soft and hard infrastructures, existing welfare and institutional structures and finally the existence of entrepreneurial activity in a particular region/locality (Cornett, 2009; Naudé et al. 2008; Audretsch and Keilbach, 2004).

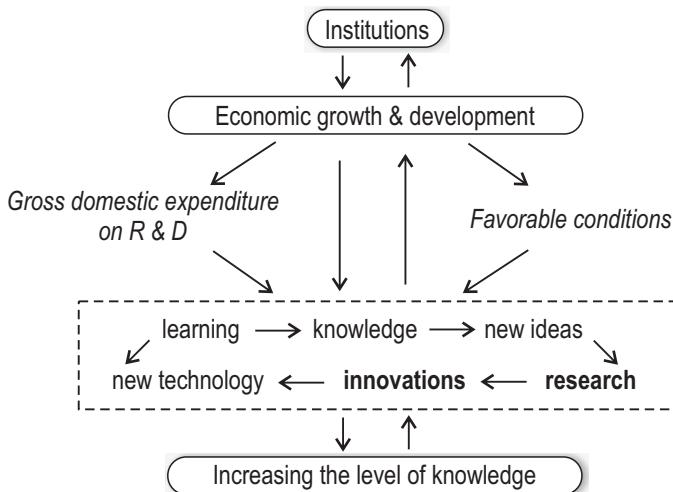
1.5 Institutional effect on innovations

The role of institutions and especially economic institutions is proven to be very high when it comes to economic growth and sustainable economic development (D. North, O. Williamson, D. Acemoglu, J. Robinson, M. Aoki, D. Rodrik A. Greif et al.). Institutional pluralism can be defined as simultaneous operation of all institutions (in different combinations) and it has proven its consistency and efficiency on the example and in the practice of developed countries and economies. This is not the case in majority of countries in transition. They are characterized by ruling nomenclatures and alibi economists (so-called “reformers” as holders of quasi-neo-liberal economic policies) that have reduced the use of institutions and economic institutions. Because of the interests of ruling nomenclatures these institutions are reduced to a variety of recombined forms of quasi-institutional mono institutions - quasi-market forms of vulgarized neoliberalism.

“Neoliberals” are constantly referencing themselves on F. Hayek, forgetting that he clearly stated that it is necessity to play by the rules, because without them market coordination is hardly attainable process. Market “game” without dependable rules or with alternative rules (institutions) has led to the reduction of institutional competition. This was an objective and serious barrier on the way toward real institutional changes, that are expected to create affirmative and efficient institutional ambient, which would lead to economic growth and development.

Holding in mind two proven facts: a) institutional development is positively affects economic growth and development and b) economic development directly (through motivation and large scale investment in education and science) and indirectly (through creating good conditions: scientist wages, communication, information, statistics, projects etc.) affects growth of expert knowledge and innovations, it can be concluded that there is a relation with a strong feedback as shown in Figure 2.9. The relation: *institutions – economic development – investment into knowledge – innovations – increase in the level of knowledge* – can be analyzed in different manners, but the expression of mentioned influences has become real and significant in the economic reality and led to the creation of the term “knowledge economy”.

FIGURE 2.9: DEVELOPMENT FORMULA OF KNOWLEDGE ECONOMY



Source: V. Draskovic, R. Jovovic, and M. Draskovic 2013, p. 17

The term describes dominating phenomena and its characteristics in the countries with developed institutions, infrastructure and innovation production. Regardless the relativity of given indexes, all previously said can be analyzed and proved by comparing KEI index (that includes innovations) and GCI for selected countries (Table 2.2).

If as a methodological criteria, for the grading the relation between institution development and level of knowledge, ranking of a selected country in the world (Table 2.2) is used, then it can be concluded that developed countries (and Russia) have larger consistency between selected indicators, while countries in transition (beside Russia) are showing inconsistency of larger or smaller scale between indicators. Main question in this paper is: Why does in the countries in transition, with small level of institutional development, phenomena of higher level of knowledge occur? Our opinion is that a solution can be found in the traditionally developed education and science system and this has been continued even in the period of transition.

TABLE 2.2: COMPARATIVE VIEW OF KEI AND GCI INDEX (FOR INSTITUTIONS)
BASED ON THE POSITION IN THE RANK LIST IN 2012

Developed Countries	KEI Rank	Institutions Rank	Transition Countries	KEI Rank	Institutions Rank
Sweden	1	6	Austria	17	25
Finland	2	3	Hong Kong	18	10
Netherlands	4	7	Estonia	19	30
Norway	5	8	Czech Republic	26	44
New Zealand	6	2	Hungary	27	55
Canada	7	11	Russia	55	53
Germany	8	16	Ukraine	56	132
Australia	9	18	Slovenia	28	58
Switzerland	10	5	Croatia	39	98
Ireland	11	19	Montenegro	60-70	62
Unit. Kingdom	14	13	Serbia	49	130

Sources: KEI and KI indexes KAM, 2012, pp. 1-4; The Global Competitiveness Report 2012-2013, pp. 16-17.

If a fact of low investment into knowledge in countries in transition is held in mind, then it can be concluded that a paradox fact exists: despite the weak development of institutions and modest effect on economic development (small scale investments into science), scientific results achieved in the countries in transition are still on a relatively high level. Of course, lack of investments is the main reason why they aren't transformed into innovations.

1.6 Montenegro and Croatia Case

Montenegro doesn't have a position based on KEI index (it hasn't been calculated but the assumption is that it would take a position between 60. – 70.). Based on GCI 2012 index it takes 62nd position and in terms of institutional development 74th and by the factor of innovations 69th position. It is not clear how the given data were calculated, since in Montenegro, like in all other countries

in transition, of long term institutional vacuum exists (collapse of formal institutions), dominance of alternative institutions and quasi- market structure (classical quasi- institutional mono institutions of neo-liberal type). In addition to all of this, there are no valid statistical data about innovation activity, beside scientific papers and projects. The only solid fact is that Montenegro was spending 0,41% of its GDP lately for science and development (GERD) and from this money very small amount was invested into business part (BERD). This affected export structure poorly, which is primarily commodity based.

When compared to very small investments, scientists from the state University of Montenegro published relatively large number of science papers in renewed international journal (see on <http://www.ucg.ac.me/cg/nauka/ByYears.php>). From 2006 to 2012 on a yearly base it was between 150 and 185 published papers. Many professors didn't register their papers, so the number could be even larger. This is very important fact, if a lack of project resources is taken in charge together with relatively low wages in the University (650 – 1200€, based on the position and fees for extra working hours). It is a paradox that under conditions of low living standard and small investments into science relatively good scientific results are achieved. The only explanation is tradition and individual motives. One more paradox should be mentioned: with the start of Bologna process many new private faculties have been opened. A lot of them do not satisfy elementary requirements for organizing classes, but the students pay high scholarships and they get diplomas for which they don't have suitable knowledge. "Science" workers from private faculties don't publish papers almost at all, when it comes to international journals. It is clear that this will negatively affect social and economic development in long run. Third paradox is drastic decrease of investment into high education and state university where 95% of research is conducted and 95% of researchers work. Fourth paradox is missing link between scientific researches and economy, which is in recession for long with collapsed industrial structure. Fifth paradox is commercialization of innovation and patents and minimizing these activities.

The Croatian R&D paradox stems from inadequate structure of the R&D sector, which is characterized by domination of the public sector in R&D activities. Never the less, Croatia is on 39th position by KEI index in the year 2012, but in the same year Croatia was on 77th position by GCI index, and in terms of institutional level 98th position and in terms of innovation factor 85th position. It is very difficult to take this data as valid when Croatia and Montenegro are compared, especially because there many realistically better indicators in Croatia. We will list some of them like: higher level of scientific development, much larger number of research institutions, larger number of researchers, higher GDP per

capita in Croatia for about 6000€, 0,6% larger investments in science and development from GDP, much larger number of scientific journals etc.

2. CONCEPT OF SOCIAL CAPITAL

In the economic literature, certain terms are often used as synonyms or in similar contexts. Therefore, it is necessary to explain in detail and define them, in order to understand their correlation and relationship. One of the most general terms used is *social capital*. That includes capitalized economic benefits that society receives from communication, cooperation, mutual trust and action, formed at the level of economic relations between individuals. It is the capital of durable and more or less institutionalized (network) relationships between individuals and organizations, facilitating the activities and creating the new value.

Wikipedia states that social capital is understood as:

"a system of norms and networks (community society) that facilitate collective action", and

"social (shared) resource that facilitates and/or hinders the access of individuals to other social, economic, and natural resources".

It is a concept based on specific social values. Its significance is that it facilitates the understanding of citizens' participation in group activities, as well as non-monetary forms of social interactions as a source of material and/or financial benefit, and power. Concerned term is used in sociology to describe the human part of good governance, democratic behavior and development of a community.

The development of the modern concept of social capital begins in the 1990s, when R. Putnam functionally linked the efficiency of the state to the ability to unite with individuals in a particular community. This meant that social interaction in society and the economy formed social capital. Its concept involved synergy economics, political science, theory of development and sociology, as well as function of the market, government and social development. He (2000, p. 19) has treated the welfare society as a link between individuals and social networks built on them and the norms of reciprocity and trust. According to M. Taylor, individual actions in the reciprocal system of social relations is seen as a combination of short-term altruism and long-term personal interest (non-market

manifested and presented – author's note). Interesting is Putnam's conclusion of inverse relationship between social capital and individualism, which can be used to explain the failure of neo-liberal oriented economic policies.

J. Coleman (1988, p. 98) defined social capital as a set of relations between different entities, consisting of some aspect of social structures and supporting the activities of individual and corporate actors in it. The relationship structure between social actors can help establishing their voluntary relations and mutual obligations, creating a social environment based on trust, opening the information channels and defining norms and sanctions for certain behavior (Ibid, pp. 102-104). Coleman (1990, p. 302) distinguishes *social capital* (as a relational, which is defined through its target function, embedded in the social structure as a public good and is inherent to the relationship structure between entities - but not within them), from *human capital*, directed towards private interests and matching benefits. He (Ibid, p. 305) argues that social structures becomes social capital only when the actor effectively use it for his personal interest.

P. Bourdieu states that man lives simultaneously in several social spheres: cultural, scientific, economic, political, religious and others. Government defines the position of man in society by the scope and structure of its accumulated capital in various forms, including social capital that is forming a social network, where information is exchanged faster and with lower transaction costs than in the case of supporting the market. He believes that "*the benefit that accumulates due to membership in a group represents a basis of possible solidarity.*"

Most authors consider social capital as a potential of social structures and attitudes that support increasing the effectiveness of collective action. In this respect, A. Krishna (2002, p. ix) explains social capital as "*a tendency to mutually beneficial collective action, resulting from a quality of relationships between people in a group or community.*" It is all about networks, norms and trust, that facilitate coordination and cooperation for mutual benefit.

Social capital of the participants in the market competition is very important, since each participant has its own network of contacts: they are connected, reliable, supportive, mutually dependent in money-commodity exchange. Network structure of each market entity can create a competitive advantage in terms of return on investment ratio. Each of the participants in the market (and social life) has three types of capital:

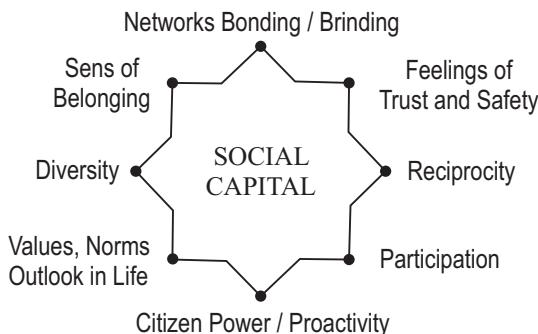
- *financial capital* (cash, savings, lines of credit, assets),
- *human capital* (natural qualities: charm, health, intelligence, knowledge, skills, education, work experience and so on.), and

- *social capital* (links with other entities through friends, relatives, colleagues, ie contacts that enable them to successfully implement their financial and human capital).

In organizations, social capital of the people is integrated into the social capital of the organization. From the organization's point of view, financial and human capital determine its ability to produce some goods and/or services. Relations inside and outside the organization define its social capital. Financial and human capital are different from the social, as they are the property of the individual and are related to the concept of investing. Social capital is the property of both parties in the relationship, because no individual has exclusivity over it. When someone withdraws from this relationship, social capital contained in them disappears. Furthermore, social capital has a direct impact on the level of return investment in a financial and human capital and maximizing the profit.

Social capital is a much disputed term. Boeck & Fleming (2005) based upon an extensive literature review developed a multi-faceted framework. The following framework contains those key features of social capital most supported by research literature (e.g. participation in networks, trust, diversity - Onyx & Bulle 2000, p. 89; Putnam 2000, p. 16) and contains factors which were seen as related to social capital or which might influence the enhancement and development of social capital (i.e. sense of belonging, outlook in life).

FIGURE 2.10: SOCIAL CAPITAL FRAMEWORK



Source: According from Boeck, T., Fleming, J. & Kemshall, H. (2006).

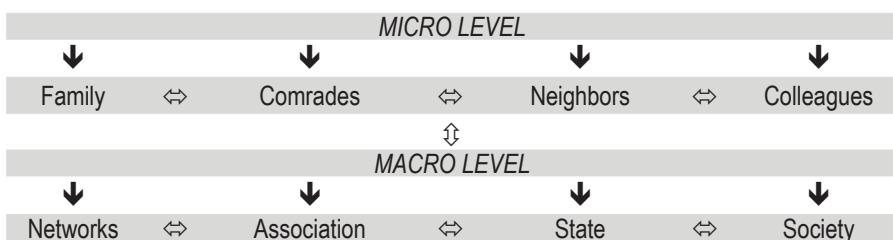
Social capital has a positive effect on the realization of economic transactions and costs reduction, manufacturing, confidence, risk-taking, negotiation quality, misinformation reduction and so on. The World Bank there includes institutes, relationships and norms that form the qualitative and quantitative social interaction in society. There are three forms of social capital:

- *structural* (associations, networks, institutes, regulations and laws governing the operation),
- *relational or connecting (bonding* - the quality of connectivity, networks), and
- *cognitive* (norms, behavior, relationships, trust, value).

L. Araujo and G. Easton (1999, p. 563) list three main characteristics of social capital:

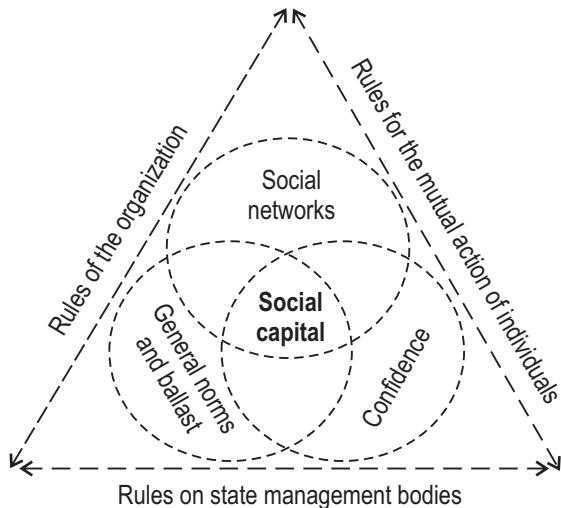
- *Purposefulness*. Many social networks does not necessarily grow into social capital, but those links help the individuals to achieve a particular goal. Social network and social capital are different things. Social network is an element of social capital, only if such social connections are beneficial;
- *Awareness*. Social workers should be aware of the usefulness of the social capital. Social structure where someone belongs, may offer certain advantages, even if that someone is not aware of that. Purposeful unused benefits of social structures do not create social capital; and
- *Forming on the basis of the existing social structure*. Social capital is formed in certain social structures. It is a resource essential for the realization of a goal. Many authors use the *institutional* approach to study the social capital, discussing the ways in which formal and informal institutions influence the accumulation of social capital in a social group.

FIGURE 2.11: LEVELS OF SOCIAL CAPITAL



Research of M. Woolcock and D. Narayan (2000, pp. 225-251) showed that the sustainable development of the economy is necessary partnership of private business, society and state. Government not only creates social good, but also helps the long-term and effective alliances between different social groups and classes. In countries with developed institutional pluralism there is a strong social consensus, representing the balance of interests of different social classes and groups regarding the distribution of the social product, minimum wages, transfer payments and the like. This consensus guarantees and increases the social security, supporting the investment growth and improving the investment environment, accelerating the economic growth and so on. Scientists have discussions about the structure of social capital. Some of them abstract four elements: social networks, general norms, values, and trust. Others single out three elements: social networks, general norms, and beliefs, as well as the two factors required for the formation of social capital: trust and rules (at all levels). Certainly, the experience is also an important factor.

FIGURE 2.12: ELEMENTS OF SOCIAL CAPITAL



Social environment can be divided into micro and macro environment, with no strict limits. To which environment should social relations belong depends on their character and direct social contact. Social elements of both environments interact with each other and are inextricably linked.

At the micro level, social capital is formed in horizontal social layers and relationships between individuals, selected according to the general norms and values of households. Efficiency of the group and organization success depend on quality of these relationships. Appropriately, the benefits of social capital, created by the network of individuals, can be achieved not only at the micro, but also at the macro level, through stability and compatibility of the social interests.

Social environment can be divided into micro and macro environment, with no strict limits. To which environment should social relations belong depends on their character and direct social contact. Social elements of both environments interact with each other and are inextricably linked.

Attempting to conceptualize the concept, Grootaert and Van Bastelaer (2002) identify two important dimensions of social capital: level from micro to macro; and the continuum from cognitive to structural (refer to figure 2.14).

FIGURE 2.13: CONCEPTUALIZATION OF SOCIAL CAPITAL
(DEVELOPED BY GROOTAERT AND VAN BASTELAER)

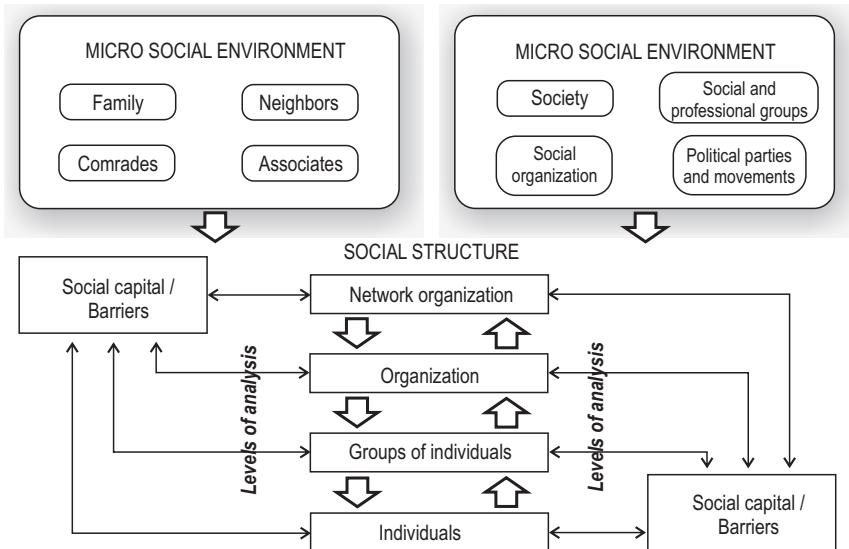
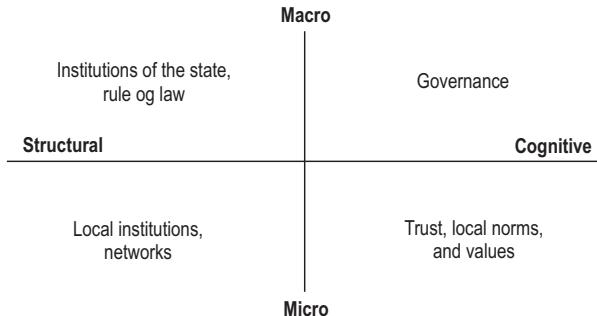
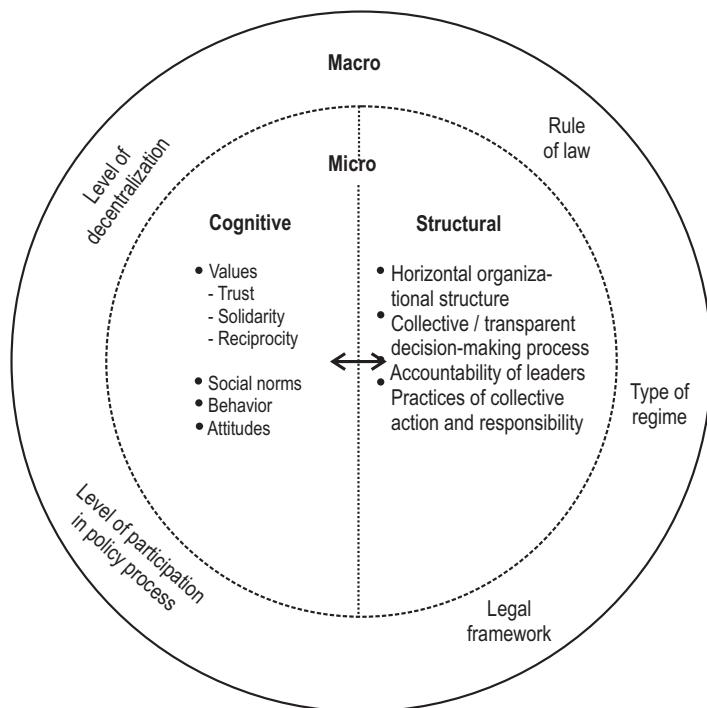


FIGURE 2.14: CONCEPTUAL FRAMEWORK: LEVELS AND TYPES OF SOCIAL CAPITAL



Source: Grootaert & Van Bastelaer 2002.

FIGURE 2.15: CONCEPTUAL FRAMEWORK: LEVELS AND TYPES OF SOCIAL CAPITAL

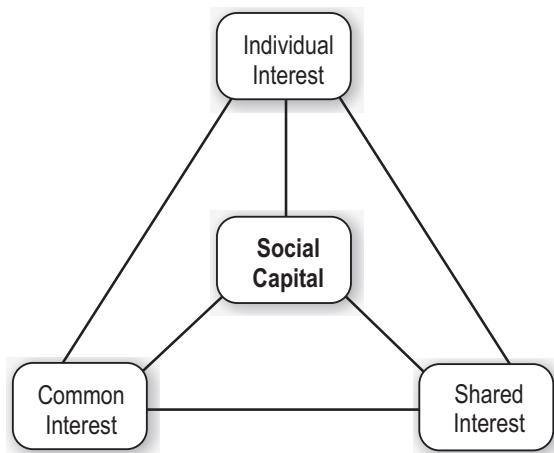


Source: Bain and Hicks 1998.

Bain and Hicks (1998) roughly divide social capital into two levels: the macro and the micro. The macro level refers to the institutional context in which organizations operate while the micro level refers to the potential contribution that horizontal organizations and social networks make to development (see Figure 2.15).

Social Capital has become an engaging factor and we all are serious to build up social capital. When we discuss about the term social capital, let answer - how can we define the term social capital? We seem that the broader definition is of The World Bank: "*Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions... Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together*" (The World Bank 1999). According to Dekker (2001); Uslaner (2001) social capital is about the value of social networks, bonding similar people and bridging between diverse people, with norms of reciprocity. Dekker and Uslaner (2001) wrote that social capital is fundamentally about how people interact with each other. By many authors, social capital means a network of relationships between individuals and various entities J. Field's (2003, 1-2). Our research of this unique scientific term shows that many people are wondering about this term. One reason for that is that social capital does not have a clear, undisputed meaning, for substantive and ideological reasons (Dolfsma and Dannreuther 2003; Foley and Edwards 1997).

FIGURE 2.16: NETWORK OF RELATIONSHIP: AN ENGAGING EXPERIENCE



According to R.Putman (2000, p. 19), the social capital guru: “*Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called “civic virtue.” The difference is that “social capital” calls attention to the fact that civic virtue is most powerful when embedded in a sense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital.*”

Social capital is, in our view, an engaging experience of relationship of networks. It is all about a relationship between individuals, entities and other social norms. Uniqueness of it reflects on trusting relationship that adds values, opportunities and possibilities which helps in promoting a quality life. It contains mix of cultivating cultures, engagement, equality, trust, tolerance and solidarity. The aspect of relations among individuals shows that we have to consider three important factors – individual interest, shared interest and common interest. So, when these three interests mutually are engaged that provide an incentive in building social capital.

Social capital has enormous role for individuals, and society, such as:

- The quality of our existence comes from the quality of social capital.
- Provides incentives to globalization, knowledge spillover, community development and human progress. With good quality of social capital, we can better deal with a ‘wasted opportunity’.

Table 2.3 shows the Extension’s Community Social Capital Model. This model shows the whole social capital picture, where the inner ring focuses on examples of trust in each type of network. This strong “trusts” result in the connections described in the outer ring. Social capital is one of the resources available to community residents that can help a community thrive and achieve or maintain resiliency. The other types of capital include human capital (the skills and abilities of individuals in the community), natural capital (which comes from the lands and waters within and around the community), and built capital (a community’s infrastructure such as water, sewer, road, electrical, educational, and health care systems). Some frameworks add other types of capital such as cultural, political, or financial capital. Following are some of the notable benefits of Social Capital:

TABLE 2.3: SOCIAL CAPITAL DEFINITION

<i>Political sciences</i>	<i>Sociology</i>	<i>Social network analysis</i>
↓	↓	↓
Trust (social norms) Putnam (1993, 2002) Fukuyama (1995)	Coleman (1990)	NETWORK (social structure) Burt (1992) Lin (2001)
Focus on individual behaviour (methodological individualism is assumed)		Focus on relations (structural approach)
↓	↓	↓
Theora of reciprocity (Bowles 2004, Fher et al. 2000, 2001)		Economic sociology (Smelser-Swedberg 2005)
Game theory, antropology, behavioural economics		

Source: Sodano, Hingley & Lindgreen 2008, p. 497.

Networks. With the greater need for geographic diversity in search of talent, ideas, and partners coupled with increased travel costs and rising fuel prices, online social networks provide a means for connecting that is key to business survival. No longer can executives be the only contacts for a company; more and more team members should be involved with spreading the message and bringing back information from outside the organization.

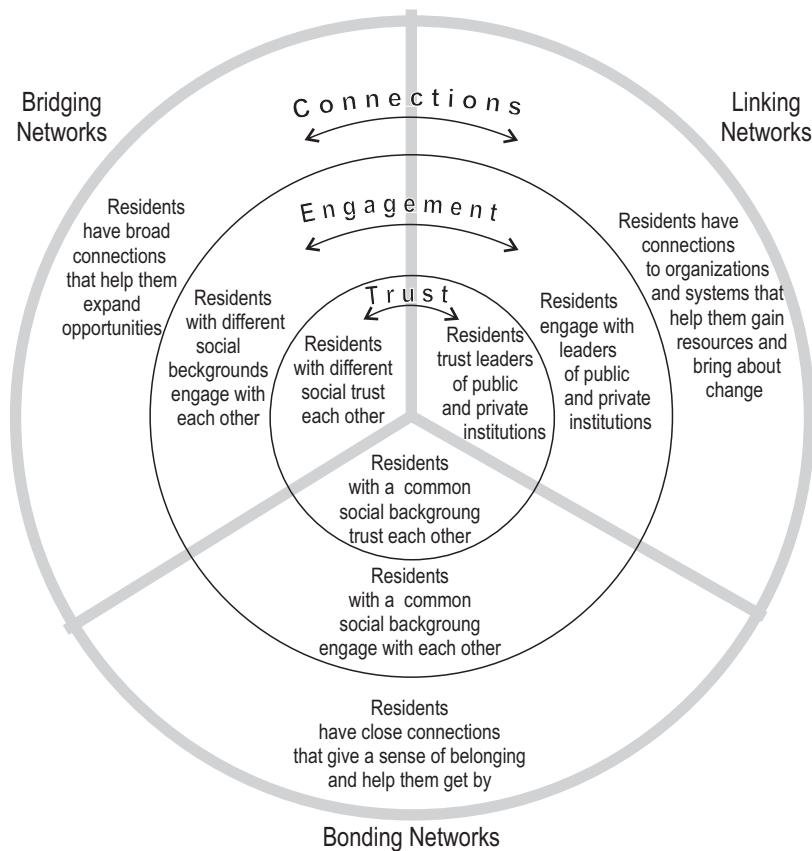
Cooperation. The ability to maintain authentic and transparent lines of communications allows for the clarification of expectations and ongoing accountability. When everyone involved on a project is clear on common goals and what each party is undertaking and accomplishing toward their achievement, a team creates and maintains a spirit of cooperation throughout the life of a project.

Long Term Relationships. During both economic downturns and prosperous times, dependable relationships are critical for success in business and in life. By nurturing these relationships with an ongoing communications and networking plan that provides mutual respect, you can weather both economic storms and prosperity with your friends in business.

Reciprocity. As old as the principles contained in the golden rule—do for others what you would want them to do for you—is the common sense notion

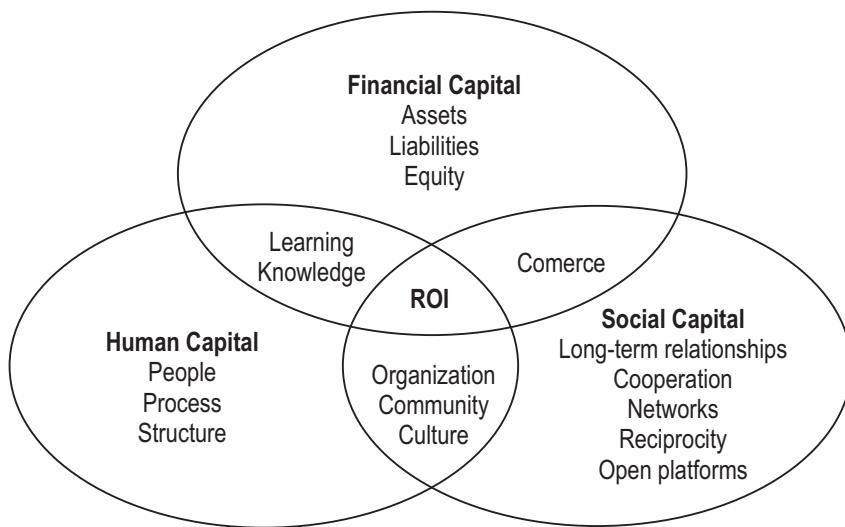
that by helping someone else they will be more likely, in return, to help you. When your knowledge and experience is available online and off for people and companies in your network, often their knowledge and experience is available for you in return. This growing resource is worldwide in its capacity, and being connected to that world greatly enhances your capacity to utilize it.

FIGURE 2.17: COMMUNITY SOCIAL CAPITAL MODEL



Source: http://www.pifsc.noaa.gov/qrb/2010_06/article_04.php

FIGURE 2.18: SOCIAL CAPITAL IS ONE OF THE THREE MAJOR BUSINESS CATALYSTS



Open Platforms. The only barriers to entry to the many social networking platforms proliferating across the world are the ability to access the web and the effort needed to learn your way around. The increased availability of broadband cable, satellites, and mobile devices connected to the web, combined with the expectations of digital natives and digital immigrants to have that access, is leading to an explosion of options for connection through social networks. Facebook, with over 1 billion users, is only one leading example of many options for connecting online. Every day new networks aimed at specific groups and niches emerge. Interconnectedness between platforms is being demanded and given by their developers. People demand interconnectedness between platforms, which developers by and large provide.

Box 11 - Definitions of Social Capital

TABLE B3: DEFINITIONS OF SOCIAL CAPITAL

<i>External vs. Internal</i>	Authors	<i>Definitions of Social Capital</i>
External/ Bridging/ Communal	Baker, 1990	'a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors'
	Belliveau, O'Reilly & Wade 1996	'an individual's personal network and elite institutional affiliations'
	Bourdieu, 1986	'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition'; 'made up of social obligations ('connections'), which is convertible, in certain conditions, into economic capital and may be institutionalized in the form of a title of nobility'
	Bourdieu & Wacquant, 1992	'the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition'
	Boxman, De Graai & Flap, 1991	'the number of people who can be expected to provide support and the resources those people have at their disposal'
	Burt, 1992, 1997	'friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital'; 'the brokerage opportunities in a network'
	Knoke, 1999	'the process by which social actors create and mobilize their network connections within and between organizations to gain access to other social actors' resources'
	Portes, 1998	'the ability of actors to secure benefits by virtue of membership in social networks or other social structures'
Internal/ Bonding/ Linking	Brehm & Rahn, 1997	'the web of cooperative relationships between citizens that facilitate resolution of collective action problems'

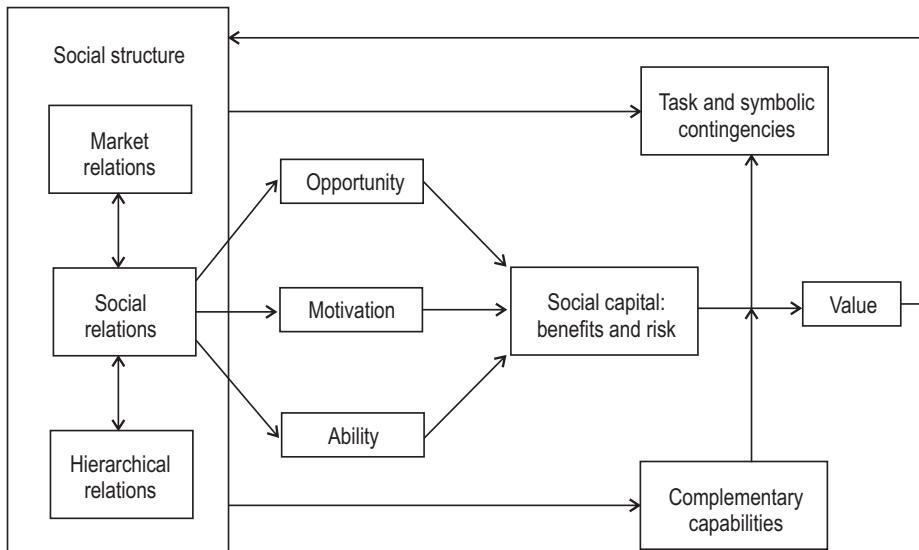
	Coleman, 1990	'Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure'
	Fukuyama, 1995, 1997	'the ability of people to work together for common purposes in groups and organizations' (Fukuyama 1995) 'Social capital can be defined simply as the existence of a certain set of informal values or norms shared among members of a group that permit cooperation among them'
	Inglehart, 1997	'a culture of trust and tolerance, in which extensive networks of voluntary associations emerge'
	Portes & Sensen- brenner, 1993	'those expectations for action within a collectivity that affect the economic goals and goal' seeking behavior of its members, even if these expectations are not oriented toward the economic sphere'
	Putnam, 1995	'features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit'
	Thomas, 1996	'those voluntary means and processes developed within civil society which promote development for the collective whole'
Both types	Loury, 1992	'naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace... an asset which may be as significant as financial bequests in accounting for the maintenance of inequality in our society'
	Nahapiet & Ghoshal, 1998	'the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network'
	Pennar, 1997	'the web of social relationships that influences individual behavior and thereby affects economic growth'
	Schiff, 1992	'the set of elements of the social structure that affects relations among people and are inputs or arguments of the production and/or utility function'
	Woolcock, 1998	'the information, trust, and norms of reciprocity inhering in one's social networks'

Source: <http://www.socialcapitalresearch.com/literature/definition.html>

Box 12 - Social Capital: Prospects For aNew Concept

The core intuition guiding social capital research is that the goodwill that others have toward us is a valuable resource. By "goodwill" we refer to the sympathy, trust, and forgiveness offered us by friends and acquaintances (see Dore, 1983, on goodwill; Robison, Schmid, & Siles, in press, on sympathy; Adler, 2001, on trust; and Williamson, 1985, on forgiveness; the accounting notion of goodwill draws from the same semantic pool but has grown broader and less specific over time; see Hughes, 1982). If goodwill is the *substance* of social capital, its effects flow from the information, influence, and solidarity such goodwill makes available (using the tripartite distinction drawn by Sandefur and Laumann, 1998). As we discuss below, these benefits are accompanied by costs and risks. These direct effects lead, in turn, to other effects of various kinds: we listed several organizationally relevant one above, and in other contexts yet other kinds of effects will be salient. For any given actor, a given effect has different *value*, depending on a number of moderating factors we discuss below.

FIGURE B13: A CONCEPTUAL MODEL OF SOCIAL CAPITAL



Source: Adler & Kwon 2002, p. 23.

Social capital's sources lie—as do other resources—in the social structure within which the actor is located. Indeed, we can differentiate social capital from other types of resources by the specific dimension of social structure underlying it; social capital is the resource available to actors as a function of their location in the structure of their social relations. But what are “social relations”? We can distinguish conceptually among three dimensions of social structure, each rooted in different types of relations: (1) **market relations**, in which products and services are exchanged for money or bartered, (2) **hierarchical relations**, in which obedience to authority is exchanged for material and spiritual security, and (3) **social relations**, in which favors and gifts are exchanged. It is this third type of relationship that constitutes the dimension of social structure underlying social capital. (This three-way differentiation extends the distinction between “economic exchange” and “social exchange” drawn by Blau [1964] and Homans [1974] along lines similar to those suggested by Cardona, Lawrence, and Bentler [n.d.]. For present purposes, we can set aside social exchange theory’s broader theoretical ambition to constitute the micro foundations of sociology)...

Social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor’s social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor.

3. CONCEPT OF INTELECTUAL CAPITAL

Simon has analyzed some elements of the concept of intellectual capital (IC) in his work *The Administrative Behavior* (1945). He studied the limits of human cognitive capacity, so-called *limited rationality*. He denied the neo-classical conception of limited resources, arguing that the traditional inputs of capital were limited by physical amounts or financial circumstances, and IC was limited only by limited rationality of employees. Nobel laureate G. Becker (1962, p. 12) stresses that human capital was an intellectual resource at the individual level, ie. a set of human skills in order to obtain income. He is known for his later (2003, p. 39) definition: “*The human capital is created on human investment basis, among others by training, preparation for production, the cost of a healthy diet, migration and search for information on prices and incomes.*” Naturally, there are difficulties and inconsistencies in various theoretical approaches to the measurement of human capital.

TABLE 2.4: DEVELOPMENT OF I.K. CONCEPTION

Initiators of ideas i. k. A. Smith (human capital) K. Marks (role in production science and technique) J. S. Mill (quantity and quality of human capability for) F. Taylor (scientific management) J. Schumpeter (recombination of knowledge and process innovation as factor of economic growth) H. Simon (limited rationality)	→	Creators of human capital conception G. Becker T. Shults K. E. Sveiby	→	I. k. organizations T. Stewart, E. Brookings, D. Klein, L. Edvinsson, M. Malone, P. Sullivan
			↓	New macroeconomic conception <i>New theories of economic growth:</i> P. Romer, R. Lukas <i>Evolution-innovation approach:</i> P. Nelson, S. Winter <i>New conception of national wealth:</i> J. Kendrik, T. Shults <i>Japans school:</i> H. Itami, I. Nonaka, S. Tsuchiya
			↑	Assessment i. k. of society N. Bontis, A. Bonfour, L. Edvinsson,

In his book *The Tacit Dimension* (1967) M. Polanyi has introduced the terms of *explicit* and *implicit* dimensions of knowledge. Explicit knowledge can be codified, protected by patent or trade secret, it has a form of commercial product or is contained in the machines and procedures that the company uses in production systems. Explicit knowledge is clearly expressed and its expansion is easy (drawings, technical specifications and standard designs). Implicit or experiential knowledge is formed from industrial know-how. It is an invisible asset of the company. Implicit knowledge is not clearly expressed, but it is embedded in employees relationships, routines and culture, that company has developed, for solving various problems. Through interaction between explicit and implicit elements of knowledge the company achieves its goals.

P. Romer (1980) has published a series of articles, so-called new or endogenous growth theory. His main contribution was highlighting the critical role of knowledge and ideas in the economic growth that comes from within the system. In his article *Increasing Returns and Long Run Growth* (1986) he proposed a model that economic growth depends on the accumulation of knowledge at all levels.

The world is divided into physical objects and ideas. The objects are scarce and susceptible to declining revenues, but knowledge and ideas are not. In his article *Endogenous Technological Change* (1990) Romer has cited four main inputs as the constituents of endogenous growth models: a) *capital*, measured in units of consumption goods, b) *labor*, as a skills available to the people, c) *human capital*, which includes activities such as formal education and training of employees, and d) *index of technology level*.

Romer concluded that countries wishing to promote economic growth must: a) encourage investment in research and development of new ideas and b) subsidize the accumulation of total human capital at the state level. He proved that the drive for economic growth are not government measures, but competition between companies that compete through innovation. Innovation must be created within the company, as innovations obtained from the environment are a public good, and they are available to the competition. Based on them, company can not gain competitive advantage. R. Nelson and S. Winter (1982, p. 134) are responsible for the development of economic change evolutionary theory. According to them, companies are depots of knowledge. Scholars emphasize the importance of organizational routines, ie. "*generic material of the company that provides interaction of explicit and implicit knowledge.*"

TABLE 2.5: YEARS, AUTHORS AND WORKS IMPORTANT FOR DEVELOPMENT I. C. CONCEPTION

Year	Author	Title of book/paper / model
1980	Hiroyuki Itami	<i>Mobilizing Invisible Assets</i>
1986	Karl-Erik Sveiby	<i>The Know-How Company</i>
1986	David Teece	"Profiting from Technological Innovation"
1987	Debra Amidon	Managing the Knowledge Asset into the Twenty-First Century

1988	Karl-Erik Sveiby	"The New Annual Report"
1989	Karl-Erik Sveiby	<i>The Invisible Balance Sheet</i>
1989	Peter Drucker	<i>The New Realities: in Government and Politics, in Economics and Business, in Society and World View</i>
1990	Charles Savage	<i>Fifth Generation Management, Dynamic Teaming, Virtual Enterprising and Knowledge Networking</i>
1990	Karl-Erik Sveiby	<i>Knowledge Management</i>
1990	Peter M. Senge	<i>The Fifth Discipline</i>
1991	Thomas Stewart	"Brainpower - How Intellectual Capital Is Becoming America's Most Valuable Asset "
1992	Robert Kaplan & David Norton	device Balanced Scorecard model for assessment of intangible assets
1993	Hubert St. Onge	Conception of consumer capital
1994	Thomas Stewart	"Intellectual Capital"
1995	Ikujiro Nonaka & Hirotaka Takeuchi	<i>Knowledge Creating Company</i>
1995	"Skandia"	published first report about intellectual capital
1996	"Skandia"	established Future Centre - director Leifon Edvinsson
1997	Karl-Erik Sveiby	<i>The New Organizational Wealth</i>
1997	Thomas Stewart	<i>Intellectual Capital</i>
1997	L. Edvinsson & M. Malone	<i>Intellectual Capital</i>
1998	Nick Bontis'	World congress about intellectual capital in Hamilton, Kanada

Source: http://www.fer.unizg.hr/download/repository/uvod_u_upravljanje_znanjem

In their article *The Core Competence of the Corporation* (1990) C. K. Prahalad and G. Hamel have developed the theory of core competence, which represent important areas of the organization that defines its main task and the importance in general. These are the intellectual property, aspects of know-how, intellectual property and network distribution.

In his article *Profiting from Technological Innovation* (1986) D. Teece have synthesized various research and thinking. He developed a new approach to technological innovation as a source of value. He defined the mechanisms and steps required for the commercialization of knowledge through innovation, confirming their value in the market.

G. Feiwal (1975) have proposed the term for IC, marking the intellect as a capital resource. In his article *Human Capital Theory: Foundations of a Field of Inquiry* (1996) S. Sweetland has pointed out that studying the human capital begun in 1776. by work of A. Smith and ended in the 1960s. He believed that the greatest credit goes to Nobel laureate G. Becker, who in his book *The Human Capital* (1964) established *theory of human capital*, defining it as activities to increase business opportunities, investing in people as the most valuable resource.

However, T. Stewart's article: *Brainpower-How Intellectual Capital Is Becoming America's Most Valuable Asset* (1991) represents the "birth" of the IC concept. He defines it as "a sum of everything that employees know, which gives a competitive advantage to the company in the market. These are knowledge, information, intellectual assets, experience, which can be used to create wealth" (ie. the new value – author's note).

TABLE 2.6: MARKET VALUE OF THE ORGANIZATION STRUCTURE

Invisible assets (Financial capital)	
<i>Intangible assets</i>	Human, Struktural and Customer capital

Thus, IC represents the sum of all knowledge (human resources, intangible assets) of the company and its effecting the specific innovation, production and business processes at all stages and areas of value creation, competitive advantage and profit, as the basis of business success. Today, the total capital of the company consists of financial and IC, with the latter one is "invisible" or "intangible" (*non-tangible assets*), "*something that you can not touch, but still makes you rich*" (Scandia Future Centre, according to Milicevic 2004, ss. 51-2).

Unlike visible or *tangible assets* (land, buildings, equipment, etc..) IC is *intangible assets* (employees knowledge, information, intellectual property and experience that can be used to create value-added organization). It is difficult to fully identify it and even more difficult to effectively develop it (Stewart, 1997, p. X). IC is the main drive of innovation and competitive advantage in modern knowledge economy. It is a foundation of strategic and competitive advantage of the organization. Edvinsson and Malone (1997) and Brooking (1996) are pioneers in working with intellectual capital. Figure 2.18 contains a brief outline of their views. Edvinsson and Malone's objective was to explain the importance of intellectual capital in organizations including its key features, measures, and management approaches. Brooking has many of the same objectives in writing as Edvinsson and Malone except that she views the components of intellectual capital for audit purposes. Their views are complementary even though not identical. Differences in their views are easily reconciled when the objectives of the writers are understood.

Edvinsson and Malone pointed out that intellectual capital takes three basic forms: human capital, structural capital, and customer capital. Human capital consists of: knowledge, skills, and abilities of employees. Human capital gives to an organization capability for solving business problems. This capital cannot be owned by organizations, only by individuals. Therefore, human capital can leave an organization when people leave. Additional important aspect of human capital relates to effectiveness of organization in using its people resources from standpoint of creativity and innovation.

TABLE 2.7: COMPONENTS OF INTELLECTUAL CAPITAL

<i>According to Edvinsson and Malone (1997)</i>	<i>According to Brooking (1996)</i>
Human Capital Structural Capital: Organizational Capital Process Capital Innovation Capital Customer Capital	Human-centered Assets Infrastructure Assets Intellectual Property Assets Market Assets

Human capital is supported by structural capital which represents everything in organization to support employees (buildings, hardware, software, processes, patents, trademarks, organization's image, organization, information system, proprietary databases, etc). It includes, therefore, infrastructure that enable human capital to function. Opposite of human capital, structural capital is owned by an organization and remains with an organization even when people leave.

Diversity of components of structural capital, leaded Edvinsson and Malone to classify it further into organizational, process and innovation capital. Organizational capital includes the organization philosophy and systems for leveraging the organization's capability. Process capital includes the techniques, procedures, and programs that implement and enhance the delivery of goods and services. Innovation capital includes intellectual properties and intangible assets. Intellectual properties are protected commercial rights such as copyrights and trademarks. Intangible assets are all of the other talents and theory by which an organization is run.

The third for of capital is customer capital which encompass the strength and loyalty of customer relations. As indicators of this capital may be used: customer satisfaction, repeat business, financial well-being, and price sensitivity. Customer capital is separate from human and structural capital, and obviously has central importance to an organization's worth because the relationship with customers is distinct from other relationships either within or outside an organization. Brooking (1996, p. 13) suggests that intellectual capital is comprised of four types of assets:

- market assets,
- intellectual property assets,
- human-centered assets, and
- infrastructure assets.

Market assets consist of such things as brands, customers, distribution channels, and business collaborations. Intellectual property assets include patents, copyrights, and trade secrets. Human-centered assets include education and work-related knowledge and competencies. Infrastructure assets include managementprocesses, information technology systems, networking, and financial systems (Adapted from: Luthy 1998).

Box 13 - Impacting Future Value: How to Manage Your Intellectual Capital

Intellectual capital helps to drive success and create value. Although physical and financial assets remain important, intellectual capital elements such as the right skills and knowledge, a respected brand and a good corporate reputation, strong relationships with key suppliers, the possession of customer and market data, or a culture of innovation set enterprises apart. Growth, above-average earnings, and sustainable competitive advantages are no longer driven by investing in physical assets such as factories, offices, or machinery, but instead by investing in and managing intellectual capital. The success of leading companies such as Amazon, Google, Microsoft, and Wal-Mart is based on their intellectual capital. Physical assets such as distribution warehouses, office buildings, and stores are important, but not as much as (for example) knowledge about customers, technology, and markets. For example, organizations such as Wal-Mart, with its huge store infrastructure, couldn't perform as well as it does without a) the intelligence to build its stores at the right locations, b) the knowledge about consumers to stock the right goods, and c) its expertise in inventory replenishment. Intellectual capital allows organizations to leverage their tangible resources. Without appropriate intellectual capital, physical assets are just commodities that can yield, at best, average returns. Identifying and managing the right intellectual capital is and will increasingly be the key differentiator between successful, mediocre, and failing enterprises.

What is Intellectual Capital?

Before we can identify, measure, manage, and report on intellectual capital, we need to understand what we mean by that term. The concept of intellectual capital is often discussed, but not always well defined.⁸ And a multitude of different words have been used to describe the same or a similar concept. People tend to use terms such as *assets*, *resources*, or *performance drivers*; and they often replace *intellectual* with words such as *intangible*, *knowledge-based*, or *non-financial*. Any of these words (or a combination of them) can be found in the management literature. Also, some disciplines (such as the financial accounting and legal disciplines) have created quite narrow definitions, such as 'non-financial fixed assets that do not have physical substance but are identifiable and controlled by the entity through custody and legal rights,' the definition found in accounting standards. Although narrow definitions like this are necessary to ensure consistency in balance sheets and other external reports, they are less useful in creating a broader understanding of intellectual capital. This is so because they exclude many commonly accepted intangibles, such as customer relationships or knowledge and skills of employees, as they cannot be controlled by the firm in an 'accounting' sense. All of this has led to some considerable confusion about what intellectual capital is and is not.

In this guideline, we will use the terms 'intellectual capital' and 'intangibles' interchangeably. It is important to stress that there is no generally right or wrong way to classify intellectual capital. For the purpose of this guideline, it is important to provide as broad a classification as possible, to ensure that the reader gets a complete picture of what intellectual capital encompasses. The key objective of this broad classification (defined below) is to increase the general understanding of what intellectual capital is, and therefore to facilitate the identification of intellectual capital within organizations. The classification should be used as a template to ensure that all possible intangibles

are identified. Debates about a potential overlap, or whether one intangible should be put into one category or another, are therefore, at this point, not productive or particularly useful. What is important is that we identify all intangibles that matter to our organizations.

Defining Intellectual Capital

Together with physical and financial capital, intellectual capital is one of the three vital resources of organizations. Intellectual capital includes all non-tangible resources that (a) are attributed to an organization, and (b) contribute to the delivery of the organization's value proposition. Intangible resources can be split into three components: human capital, structural capital, and relational capital (see Figure B14). Each of these is discussed further below.

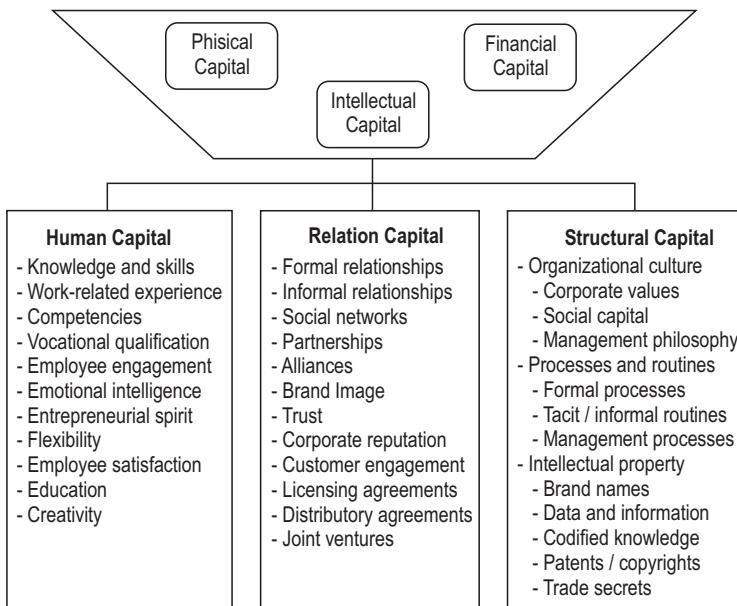
Human Capital

The principal sub-components of an organization's human capital are its workforce's skill sets, depth of expertise, and breadth of experience. Human resources can be thought of as the living and thinking part of intellectual capital resources. These can therefore walk out at night when people leave; relational and structural capital on the other hand remains with the organization even after people have left. Human capital includes the a) skills and competencies of employees, b) their know-how in certain fields that are important to the success of the enterprise, and c) their aptitudes and attitudes. Employee loyalty, motivation, and flexibility will often be significant factors too, because a firm's 'expertise and experience pool' is developed over time. A high level of staff turnover may mean that a firm is losing these important elements of intellectual capital.

Relational Capital

Relational capital includes all the relationships that exist between an organization and any outside person or organization. These can include customers, intermediaries, employees, suppliers, alliance partners, regulators, pressure groups, communities, creditors, and investors. Relationships tend to fall into two categories - those that are formalized through, for example, contractual obligations with major customers, suppliers and partners, and those that are more informal. Although the former tended to be predominant in the past, today, the latter have a more important impact on how the enterprise is managed. In today's integrated economy, with just-in-time supply chains, relationships with trading partners and suppliers can be crucial. Brand image, corporate reputation, and product/service reputation, which reflect the relationships between organizations and their (current and potential) customers, also fall into this category.

FIGURE B14: CLASSIFICATION OF INTELLECTUAL CAPITAL



Structural Capital

Structural capital covers a broad range of vital elements. Foremost among these are usually a) the organization's essential operating processes, b) how it is structured, c) its policies, information flows, and content of its databases, its leadership and management style, and d) its culture, and e) its incentive schemes. They can, however, also include legally protected intangible resources. Structural capital can be sub-categorized into *Culture*, *Practices and Routines*, and *Intellectual Property*. *Organizational culture* is fundamental to achieving organizational goals. Organizational culture provides a common way of seeing things, sets the decision-making pattern, and establishes the value system. Cultural resources include corporate culture, organizational values, and management philosophies. They provide employees with a shared framework to interpret events, a framework that encourages individuals to operate both autonomously and as a team to achieve the company's objectives. *Processes and Routines*, which reflect shared organizational knowledge, can be important organizational resources. Practices and routines include internal practices and processes; these can be formal or informal (tacit) procedures and rules. Formalized routines can be reflected in process manuals that provide codified procedures and rules; informal routines include understood (but unstated) codes of behavior and workflows. One example of a process that has become a valuable strategic resource is Southwest Airlines' airplane turnaround, which they have optimized to only last 25 minutes. This process, introduced as a necessary part of Southwest's start-up as a low-cost carrier, has today become a key differentiator.

Intellectual property - owned or legally protected intangible resources - is becoming increasingly important. Patents, copyrights, trademarks, brands, registered designs, trade secrets, database content, and processes whose ownership is granted to the company by law have become a key element of competition. Intellectual property is owned by the organization and not its employees. It represents the tools and enablers that help to define and differentiate an organization's unique offering to the markets in which it operates. Examples of intellectual property include trademark symbols such as the McDonald's Arches and the Nike Swoosh, or the patented '1-click' buying option at Amazon.com. Coca-Cola, for example, made a conscious decision to keep the formula for Coke a trade secret that it actively protects. Had they patented the formula instead, their patent protection would have run out many years ago, most likely destroying its market share.

Five Steps to Successful Intellectual Capital Management

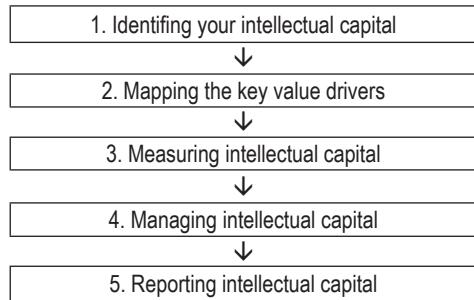
In this MAG, we will outline five key steps for successfully managing intellectual capital (see Figure 15). The first step is to identify an organization's intellectual capital. Once this is known, we need to assess its value. It is important to understand that not all intellectual capital is automatically valuable to an organization. It is only valuable if it helps to deliver the organizational objectives. In step two, we therefore assess the relevance of intellectual capital by mapping the strategy (with its intellectual value drivers) onto a strategic map. The third step is to extract meaningful management information from measuring the performance of intellectual capital. In step four, this management information can then be used to analyze performance and to develop management insights that inform organizational decision making and learning. Finally, in step five, external reports can be produced to communicate the value of intellectual capital to internal and external stakeholders.

Each of these five steps will be discussed in detail below. We will explain what each step involves, and provide a number of tools and techniques designed to help the practicing manager to better manage the organization's intellectual capital. Even though most organizations possess a wide variety of intellectual capital, some will contribute more to delivery of their value proposition than others. This is because (a) the value of intellectual capital depends on an organization's specific strategy, and (b) intellectual capital dynamically interacts with and depends on other resources:

- example, the know-how of building engines is essential for Honda, but of little value to a financial services firm; likewise, the competencies associated with creating light and durable composite materials so essential for successful Formula One motor racing teams is undoubtedly probably of little value to a telecommunications firm.

- Intellectual Capital elements are not static - they **dynamically interact** with each other, and often depend on other resources for their value. For example, Amazon.com's brand awareness and reputation, although critically important, would rapidly fade without its efficient distribution network, well-designed internal processes, and strong supplier relationships. It is therefore impossible to value a brand name without taking into account all other important factors, such as reputation, people, processes, etc. Cases such as the accounting firm, Arthur Andersen, have shown how a brand name can disappear overnight if the supporting intangibles such as trust or reputation fall away. Often referred to as the interconnectedness of resource stocks, such relationships are extremely important to intangibles.

FIGURE B15: FIVE-STEP INTELLECTUAL CAPITAL MANAGEMENT MODEL



Intellectual Capital Underpins Competencies

This means, therefore, that individual intellectual capital resources interrelate with other intangible and tangible resources to form core competencies. In turn, these allow an organization to perform its core activities to deliver its value proposition and strategic deliverables (see Figure 17). A core activity is an excellently performed internal activity that is central, not peripheral, to a company's strategy, competitiveness, and value proposition. An organization should only have very few (usually between 2 and 5) core activities.

FIGURE B16: UNDERPINS CAPABILITIES AND CORE COMPETENCIES

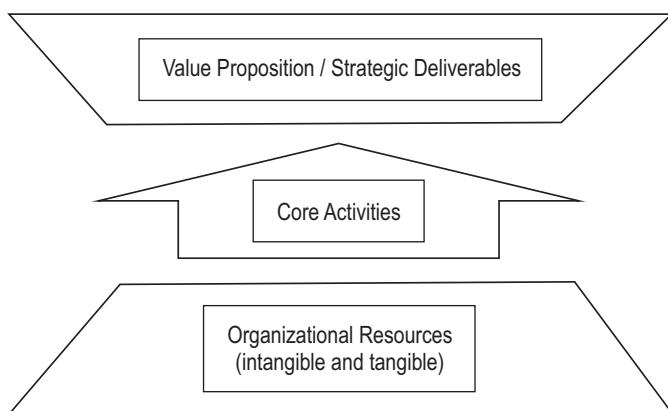
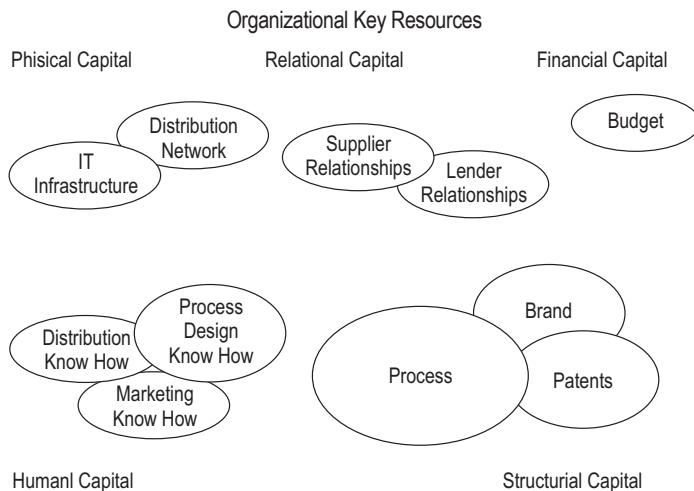


FIGURE B17: VISUALIZING THE RELATIVE IMPORTANCE OF KEY RESOURCES



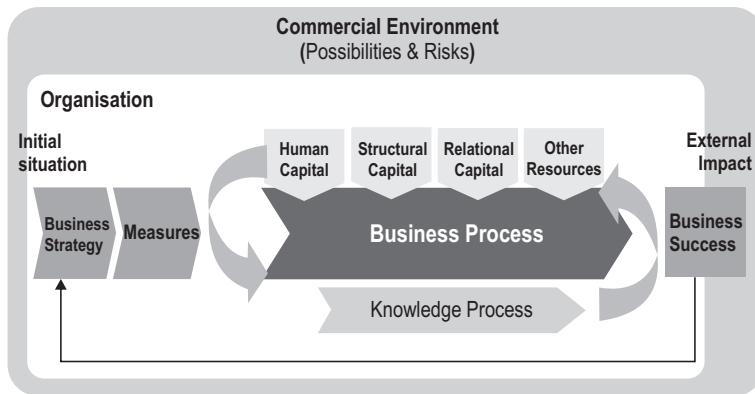
Source: Marr 2008.

Box 14 - Intellectual Capital Statement

To obtain competitive advantage in Europe, it is crucial for small and medium sized enterprises (SMEs) to utilise knowledge efficiently and to enhance their innovation potential. Furthermore, reporting those intangible assets systematically to customers, partners and investors, as well as creditors has become a critical success factor. Thus, managing their specific "intellectual capital" (IC) becomes increasingly important for future-oriented organisations. Conventional balance sheets and controlling instruments are not sufficient any more, because intellectual capital like specific Know-How and good business relations are not considered so far. The Intellectual Capital Statement (ICS) is an instrument to assess, to report and to develop the intellectual capital of an organisation.

Due to the emerging need to cover intellectual capital the project InCaS "Intellectual Capital Statement - Made in Europe" had been initiated by the European Commission in course of the Sixth Framework Programme. The InCaS project is lead by the European SME association CEA-PME, Brussels, and Fraunhofer IPK Division Corporate Management, Berlin. The collective research project aims to make the existing international experiences applicable for European SMEs. In France the ICS implementation in 5 pilot-SMEs, one of which is VMI, is coordinated by AFDEE.

FIGURE B18: ICS STRUCTURAL MODEL



The participating SMEs are to be qualified to take stock of their specific intellectual capital quickly and in a cost-effective way. Furthermore they should be enabled to edit and communicate the results towards important decision-makers. Thereby the acquisition of customers, partners and new employees is supported and furthermore the access to debt and equity capital is facilitated. Below the ICS-model is illustrated and the main terms are explained in order to enhance the understandability of the following report.

The ICS structural model serves as the frame for the following analysis of intellectual capital and can be described as follows: The strategy including an analysis of the possibilities and risks in the external business environment provides the basis for the ICS. Based on these considerations the SME derives measures regarding the different dimensions of its intellectual capital.

Human capital includes competences, skills and motivation of the employees. The structural capital comprises all organisational and infrastructural instruments, which support the management and the employees in carrying out efficient business processes. The relational capital comprises the relationships to customers, suppliers and other partners as well as to the public.

The ICS reveals the actual value of the intellectual capital regarding its potential to support accomplishing the SME's strategic objectives, production of goods and services and finally achieving business success. Thereby the significance of single IC factors is reflected, revealing the strengths and weaknesses and the highest potential for intervention.

Source: Soumet 2007.

Box 15 - Intellectual Capital: Current Issues and Policy Implications

Roos et al. (1997) traced the theoretical roots of intellectual capital to two different streams of thought - the strategic stream and the measurement stream (Figure 18). The strategic stream focuses on the creation, use of knowledge and the relationship between knowledge and value creation. The measurement stream relates to the need to develop a new information system, measuring non-financial data with the traditional financial ones.

Stewart (1997) defines *intellectual capital* as intellectual material - knowledge, information, intellectual property and experience - that can be put to use to create wealth. Roos et al. (1997) classify intellectual capital into structural and human capital, "thinking" and "non-thinking" assets. This distinction is arrived at since people (human capital) require different management methods from structural capital. Another distinction has been suggested by Brooking (1996) which identifies four components of intellectual capital: market assets, human-centred assets, intellectual property assets and infrastructure assets. The difference between these two classification systems is that they assume different levels of aggregation of the elements of intellectual capital. Most other classification schemes for intellectual capital distinguish between external (customer related), internal structures and human capital (e.g. Sveiby, 1997; Petrash, 1996; Skandia, 1995).

Companies ascribe a range of roles for value extraction from their intellectual capital. While most people tend to think quickly of the revenue-generating role, there is a range of others that are employed. The following represent some of the most often mentioned ones:

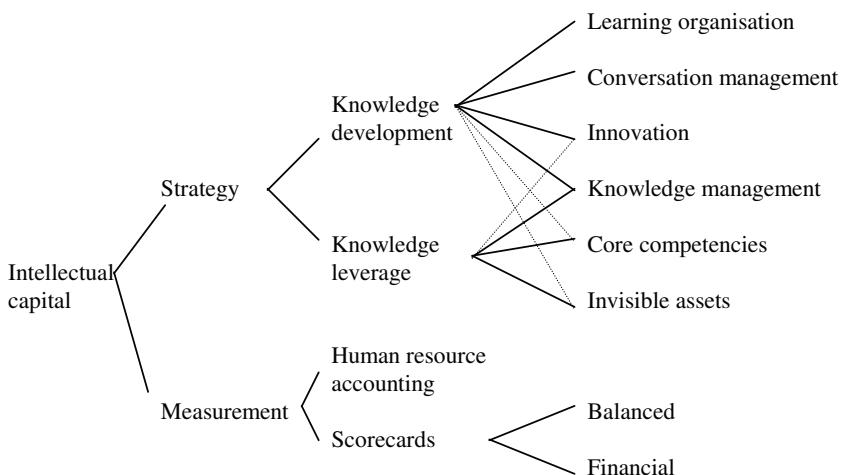
1) Defensive roles:

- protection of the products and services resulting from the innovations of the company's IC;
- design freedom;
- litigation avoidance.

2) Offensive roles:

- revenue generation:
 - from the products and services resulting from the firm's innovations;
 - from the intellectual properties of the firm;
 - from the intellectual assets of the firm;
 - from the knowledge and know-how of the firm;
- creating standards in new markets or for new products and services; creating standards in new markets or for new products and services;
 - obtaining access to the technology of others;
 - obtaining access to new markets;
 - as the basis for new business alliances;
 - support the business activities of the firm's SBUs;
 - creating barriers to entry for new competitors.

FIGURE B19: CONCEPTUAL ROOTS OF INTELLECTUAL CAPITAL

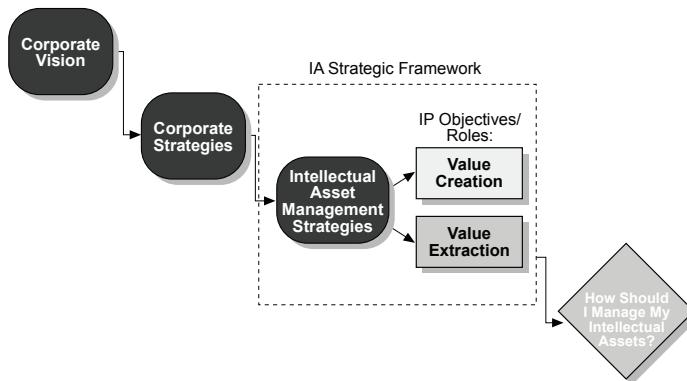


Source: Brennan, N. & Connell, B. 2000.

Box 16 - Intellectual Capital: Defensive and Offensive Roles

The importance of time in determining the value of IC When firms differentiate their IC activities as being either tactical or strategic, they are also differentiating them in terms of their impact in a *current time* or a *future time* dimension. For example, for companies whose intellectual properties are a source of current revenue, much of what is in the portfolio protects current products in the marketplace. Intellectual properties usually represent *current value* and the value extraction activities are rife with *tactical* considerations. Intellectual assets, the next "tier" of intellectual capital, are the assets with less current definition, and often more promise for the future. Extracting value from these assets usually involves thinking into the future, and discussing positioning and strategies for value extraction rather than near-term tactics. Intellectual assets, then, are usually considered as assets that bridge the transition from the present to the future (also from the tactical to the strategic) value extraction. The firm's innovation-focused human capital operates almost entirely in the future time dimension and at the strategic level, but uses the same fundamental decision processes as those found in the decision systems firms employ for extracting value from their well-defined intellectual property.

FIGURE B20: DETERMINING THE ROLES FOR INTELLECTUAL CAPITAL



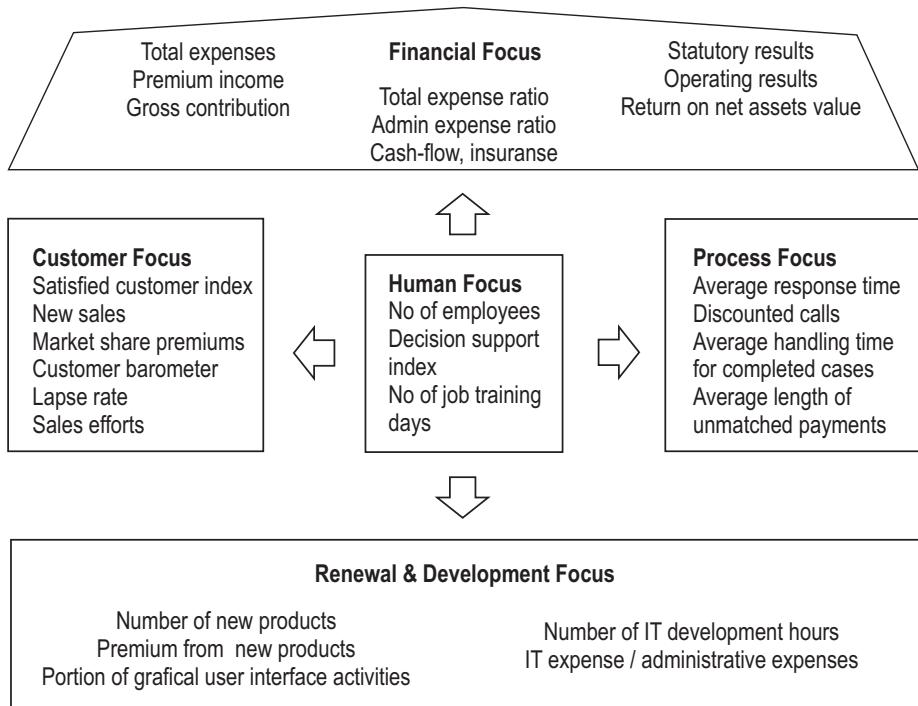
Source: Harrison & Sillivan 2000.

Intellectual capital may be the source for either one-time transaction value or ongoing,cash-flow-producing value. Although Gathering companies are focused on managing the ongoing cash-producing value of their intellectual capital, it must be recognized that IC assets are often sold individually or as packaged bundles of intellectual assets. *One-time value*. Typically realized by a sale, one-time value may be Profiting from determined for the market conditions existing at the time of the sale. *Ongoing value*. This value arises largely out of the firm's ability to produce a sustainable cash flow. In IC terms, it comprises the value of the tacit knowledge of the firm's workforce carrying out the operational functions of the business, thereby making it a going concern. Calculating a firm's ongoing value assumes that the ongoing concern will continue its business functions on the day after the valuation in much the same way that they were conducted the days before.

3.1 Skandia Navigator

Skandia has developed an IC assessment tool called the Skandia Navigator. It is very similar to the Balanced Scorecard proposed by Kaplan and Norton but adds a human perspective in order to have the following five foci of measurement: the financial focus, the customer perspective (customer focus), the process perspective (process focus), the human perspective (human focus), and the renewal and development perspective (innovation focus - Figure 2.19).

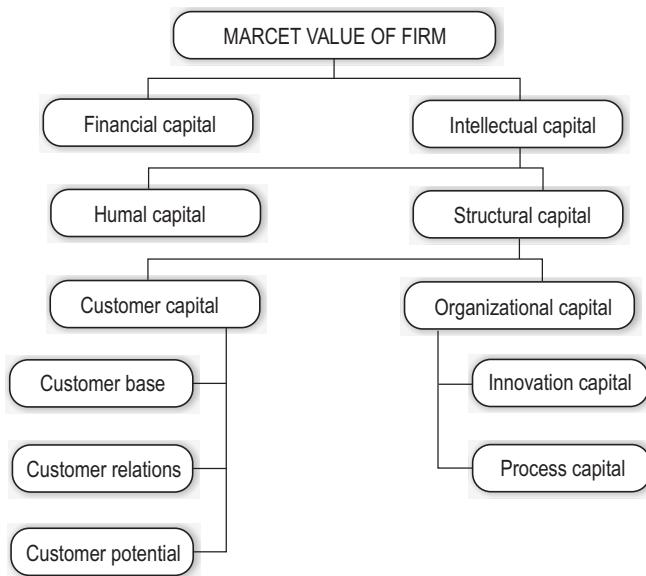
FIGURE 2.19: SKANDIA NAVIGATOR



Source: Marr et al. 2004, p. 557.

This model is based on splitting market into financial capital and IC. IC is considered to equate to the firm's intangible assets. The components of IC were subdivided into human capital, and structural capital (other intangible assets embedded in the organization). Structural capital has been further subdivided into customer capital, e.g. the value of customer relations and organizational capital. The latter can be further broken down into process capital, related to the procedures and routines of the company's internal processes, and innovation capital, that represents the enablers to innovate products and processes. The Skandia approach, therefore, splits IC into the following four categories: human capital, customer capital, process capital and innovation capital (Figure 2.20).

FIGURE 2.20: SKANDIA'S CLASSIFICATION OF THE INTELLECTUAL CAPITAL



Source: Skandia, Intellectual Capital, Supplement to Skandia's 1995 Annual Report.

The Skandia Navigator is very similar to the Balanced Scorecard and is intended to function as a management tool. Although Skandia made a significant contribution towards raising awareness of IC the problem with the Skandia approach is that it was developed specifically for one company. The classification of assets is primarily externally focused; its aim is to visualise the value of Skandia and to educate the analyst community. Also, this model is not clear as Balance Scorecard. The problem is that all measures are eventually expressed in monetary terms and it is questionable that one can express knowledge assets in monetary terms. In the Balanced Scorecard approach there is a clear vision of how the different perspectives are related. In the Balanced Scorecard financial performance is achieved by meeting customers needs with a certain market proposition, in order to deliver this market proposition organisations have to execute their processes and in order to do this they need the right training and development. It is also not clear as how the five perspectives in the Skandia Navigator relate to each other. The overarching equation which sums IC and financial capital to give the market value of an organisation is wrong since the

variables are not separable in this way as they interact with each other, they are not the same and rather represent two different sides of an equation.

3.2 Components of Intellectual Capital

According to T. Stewart (1991, p. 36), companies are increasingly dependent on knowledge (patents, processes, skills and strategies of management, technology, information on customers and suppliers, experience, etc.). The total sum is IC of the organization. It represents the capitalized knowledge, which allows the transition to economic valuation of the knowledge that an organization possesses. Such as: market intangible assets, intellectual assets, human and infrastructure assets (Table 2.8). Its importance reflects the increasing dependence of organization on the intangible assets.

Stewart (*Ibid*) explains it as the sum of everything that employees know, which gives a competitive advantage to the company in the market: "*patents, processes, management habits, technology, experience, information on customers and suppliers. Alltogether, this knowledge consists of intellectual capital.*" It is about the structured knowledge and skills as intellectual resources, available to organizations. Through the creation of added value (capitalization) these assets can easily be turned into an economic good.

T. Stewart (1997) points out that human capital reveals the following: money has the power of speech but not the power of opinion; machines often perform tasks better than humans, but they do not have the ability to invent something. The primary purpose of human capital is innovation – whether it is a new product, service, or the improvement of business process. Inventions, thinking and innovation completely destabilize the organizational routine. They continually change structural capital and re-create it to adjust the new situations and relationships.

In the literature there are many definitions of IC. Some believe that it is the sum of useful and usable knowledge of the employees in the organization and its customers. Others think that it is a synergy of the company's knowledge, experience, relationships, processes, inventions, innovations, market presence and influence on society. The fact is that IC generally represents all skills that employees possess in an organization. Comparing definitions of IC, the similarities and differences are more nuanced than a substantive nature.

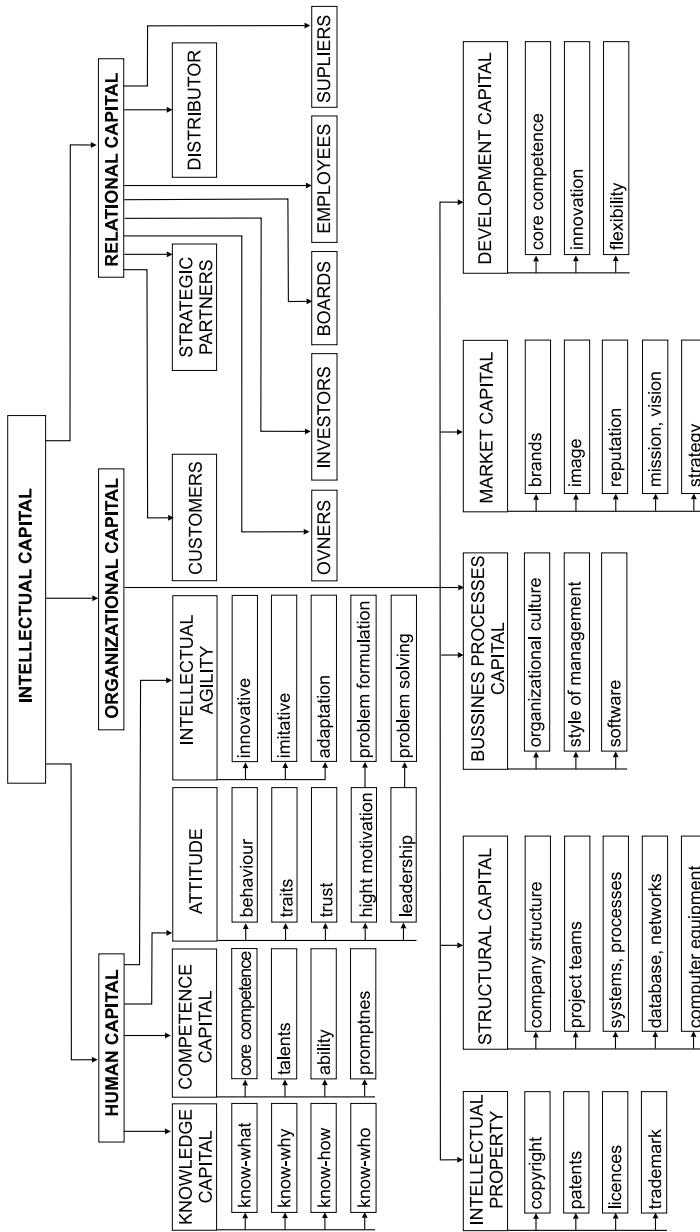
TABLE 2.8: DETAILED STRUCTURE OF I.K. FIRM

<i>Market intangible assets</i>	<i>Intellectual property</i>	<i>Human capital</i>	<i>Structural Capital</i>
Brand servicing Brands Corporate brand Customer commitment to firms' trademark Corporate name Treasury for orders Distribution mechanisms Business collaboration Licenses and franchises	Patents Copyrights know-how Trademarks Service marks Protection rights to design Business secrets	Education Professional qualifications knowledge needed for work accumulate experience and skills	Corporate culture Management processes Information technologies Network systems Relations with financial cycles Requested standards

Source: Mil'ner, 2003, p. 29.

According to G. Roos (1997), IC is made of cognitive part (human capital) and non-cognitive part (structural capital). Human capital is derived from knowledge, behavior and intellectual skills of employees. Many authors have noted a clear distinction between knowledge and IC, which represents knowledge as a dynamic human process, but only when knowledge and intelligence of employees are applied and transformed into something of value for the company and its customers. It was then that knowledge is a valuable asset or company's IC (intangible assets). Otherwise, knowledge can only remain unused intellectual potential. Karl-Eric Sveiby have made an important step in the development of IC. He recognized the need for accounting measurement of human capital as an intangible asset. In his book *The Invisible Balance Sheet* (1989) he have proposed three categories of knowledge capital: individual, structural, and consumer. The idea was in so-called "invisible" balance sheet. Later, in his book *The Knowledge Management* (1990) he pointed out that human capital dimension of IC.

FIGURE 2.21: COMPONENTS OF INTELLECTUAL CAPITAL



Source: Own work on the basis of: L. Edvinsson, M. S. Malone, 1997b, and G. Roos, S. Pike, p. 19.

TABLE 2.9: COMPARATIVE REVIEW OF THE BASIC INTERPRETATION OF IC

<i>Author</i>	<i>Structure of IC</i>
E. Brooking	market assets, intellectual property, human assets and infrastructure assets
T. Stewart	human capital, organizational capital and client capital
P. Doyl	technological assets, strategic assets, reputational assets, human resources and organizational culture
J. Hope i T. Hope	<p>a) external structures: brands, consumer aspects (consumer confidence, sales and distribution channels) and contracts,</p> <p>b) internal structure: intellectual property (patents, copyrights, licenses, stamps), infrastructure (processes, models, communication systems, databases) and culture, and</p> <p>c) skills: human skills (knowledge, experience, education, training methods), learning skills, problem solving and management skills (leadership, entrepreneurship)</p>
Scandia Future Centre	human capital (competencies, attitudes, intellectual agility) and structural capital (links with the environment, organizational development and capacity).

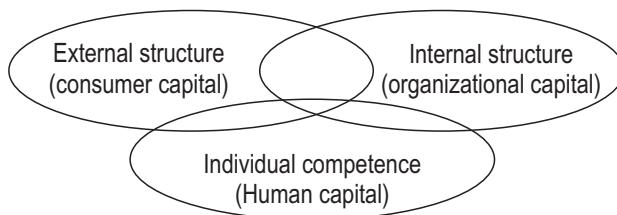
There are three types ("families") of knowledge capital, between which boundaries are not precise, but conditional:

- *Internal structure*, which includes all systems, databases, processes and routines that support the operations and employees. It consists of patents, concepts, models, and computer and administrative systems. It's created by the employees and it is a property of the organization as an integral part. These include organizational culture, technical and programmatic security, patents protect the rights, database design, information systems, organizational structure and organizational culture;
- *External structure*, which consists of external connections and relationships with customers and suppliers, as well as networks supporting business operations. That includes the brand, label, reputation and everything that makes the image of the organization. The value of this type of property depends on a way of solving the service user problems. In the literature, this type of property is often called the relational or consumer capital; and

- *Individual employee skills*, ie. ability of an individual to act in different situations. This includes labor skills, education, expertise, ideas, habits, communication skills, experience, creativity, moral values, culture, leadership features, motivation, and social skills of employees. People with their abilities tend to be loyal to the company, if they are adequately rewarded. This means that resources of IC include human resources (skills, *know-how*, competence), stakeholder relationships (relationships with users of service, licenses, distribution) and organizational resources (systems, process, organizational culture, management philosophy, intellectual property, brand).

L. Edvinsson has treated IC as a set of human, structural and consumer capital, which generate value for the company in the process of interaction. So, the paradigm of IC make consists of human and organizational characteristics that shape the profile of the modern enterprise. Edvinsson has described intangible assets as IC, crucial for the success of modern knowledge-intensive firms. In *Scandia* (1995) he have developed a model of managing the IC as “hidden values”. Edvinsson and Malone (1997) have discussed IC as knowledge that can be converted into value.

FIGURE 2.22: RELATIONSHIP AMOQN STRUCTURAL ELEMENTS OF I. C.



They (2003) metaphorically said that IC are “*the roots of the company, the hidden conditions of development, which is visible behind the facade of its building and merchandise assortment.*” In practice, managers use a simpler definition of IC and relate it to the sum of intangible assets, which are not recorded in the balance sheets of financial companies (“*hidden assets*”). But these assets can be evaluated and managed. Edvinsson has translated Smith’s metaphor of the market’s “invisible hand” to the IC as followed: “*The invisible hand of the economy, mentioned by Adam Smith, has become even more elusive*” (quote by Kolakovic 2003, p. 927).

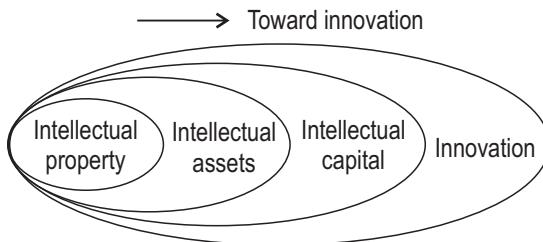
TABLE 2.10: CLASSIFICATION OF INTELLECTUAL CAPITAL

<i>Human capital</i>	<i>Relational (customer) capital</i>
<ul style="list-style-type: none"> • know-how • education • vocational qualification • work-related knowledge • occupational assessments • psychometric assessments • work-related competencies • entrepreneurial elan, innovativeness, proactive and reactive abilities, changeability 	<ul style="list-style-type: none"> • brands • customers • customer loyalty • company names • backlog orders • distribution channels • business collaborations • licensing agreements • favourable contracts • franchising agreements
<i>Organisational (structural) capital</i>	
<i>Intellectual property</i>	<i>Infrastructure assets</i>
<ul style="list-style-type: none"> • patents • copyrights • design rights • trade secrets • trademarks • service marks 	<ul style="list-style-type: none"> • management philosophy • corporate culture • management processes • information systems • networking systems • financial relations

Source: IFAC 1998.

Organization of the business is becoming more knowledge-intensive and less capital-intensive, because IC is becoming the most important and the most propulsive development. In the knowledge economy, the role of intellectual component in capital is constantly growing, and that is the fact. Specific information can be obtained from so-called Tobin coefficient (q), which is the ratio of market capitalization to the funding (usually balance) value of company assets (Hey, Morris, 1999, p. 249). It is generally considered that when the price of company significantly exceeds the cost of its tangible assets, it is a matter of proper valuation of its intangible assets (Quinn 1992, Quinn et al. 1997). S. Cantrell (2006) has researched the three-level factors of influence on human capital development in enterprises: creating the development strategy of human capital in accordance with the business strategy, providing a supportive working environment and developing the skills of employees who are ready to learn.

FIGURE 2.23: RELATIONSHIP AMONG INTELECTUAL CAPITAL, INTANGIBLE ASSETS AND INTELLECTUAL PROPERTY



Source: Adapted from Gaponenko, Orlova 2008, p. 112.

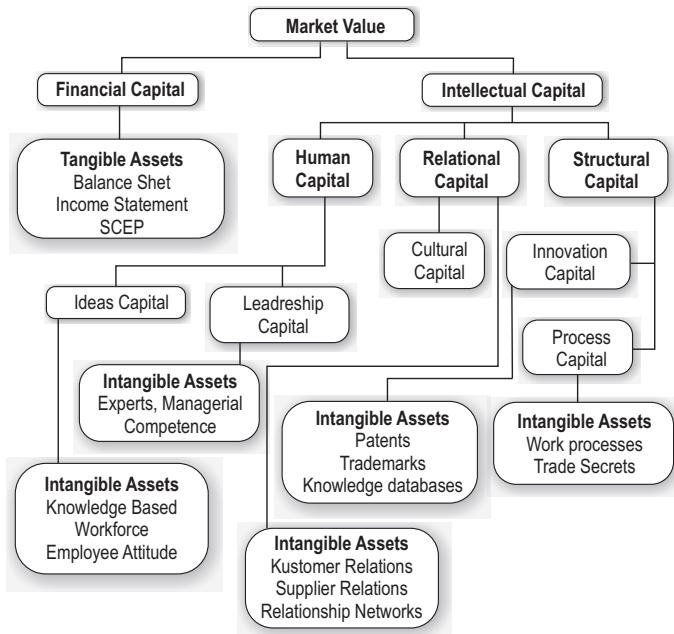
The research has shown that companies that develop their human capital have a much better financial results than those who do not. Economic agents are advised to identify demands for learning and training and to ensure that the manager work more as teachers and mentors to employees, developing with them a planned learning. The term IC is typically used by managers, the term intellectual property is used by lawyers and the term intangible assets is used by accountants and professional evaluators. The term IC is broader term because it involves intangible assets and intellectual property.

On the base of IC concept, Johnson (1999) developed a framework (Figure 2.22) that can be used to identify and measure the stock of intangible resources that have the potential to give the firm a sustainable competitive advantage. Two general measurement techniques for determining quantitative and qualitative indicators of the stock value of IC elements in the firm were identified. The first is the physical measurement of stock using internal accounting data that is for the most part non-financial. The second is the use of sociological measurements applying survey techniques of internal and external observers. Considering the intangible nature of these assets, these measures are considered most appropriate. There may be some trepidation in applying some measures to determine the value of these assets. However, there may be some trepidation in applying some measures to determine the value of these assets.

The contribution of this IC measurement approach relied on the development of useful indicators of IC stock value that correlate well with financial success, being valuable in this way for the firm. The pertinent point, generated from a Balance scorecard philosophy, is that non financial indicators can be valuable

in tracking performance as long as they are connected to strategic goals of the firm which are ultimately financial in most cases. As this approach emphasizes on the stock of intangible assets that provide value to the elements which play an important role in producing wealth within the knowledge-based firm and their value is being measured by application of the Balanced Scorecard method, however, the flow and interaction of these assets are probably more important in the creation of real wealth for the firm. According to Johnson (1999) the real potential for value is in the systemic interaction of the various elements of the framework, where in combination with more tangible measures may be useful in determining individual circumstances and thus the individual firm's ability to create a sustainable competitive advantage. Similarly, Senge (1990), and Kauffman (1980) suggested systems approach for this concept where a whole being consisted of parts that interact with each other.

FIGURE 2.24: INTELLECTUAL CAPITAL FRAMEWORK:
ITS' RELATIONSHIP TO MARKET VALUE



Source: Johnson 1999.

These interaction might be potentially complex, but with simplification of any particular firm, each firm can examine its own situation using a combination of both tangible measures and in depth examination of interaction patterns among the different elements of IC. Unlike physical capital, which is of material nature, financial capital is reviewed and related to the costs from the past; it is additive and governed by the organization completely. IC is immaterial, nonadditive and related to the results of the future; it represents the combination of valuable and nonvaluable estimation, and is governed by the organization only partially, while employing the staff.

Research conducted in 2011 in selected Montenegrin companies, in which the balance sheet data were available, shows a large dispersion of Tobin coefficient (the ratio between market price of the company and the price of its real assets: buildings, equipment, supplies, etc.).. Regardless the crisis and quality of the company's selective choice, the table 2.11 shows that the coefficient of Tobin significantly depends on the level of intellectual capital, which determines the level of company competitiveness, ie. depends on the level of use of modern managing methods, technology knowledge and application of information-communication technologies. Today, successful business requires development of IC. Scientific and technological progress is followed by development of information and communication technologies. It has increased the availability of information, speed and learning opportunities of individuals, as well as knowledge transfer.

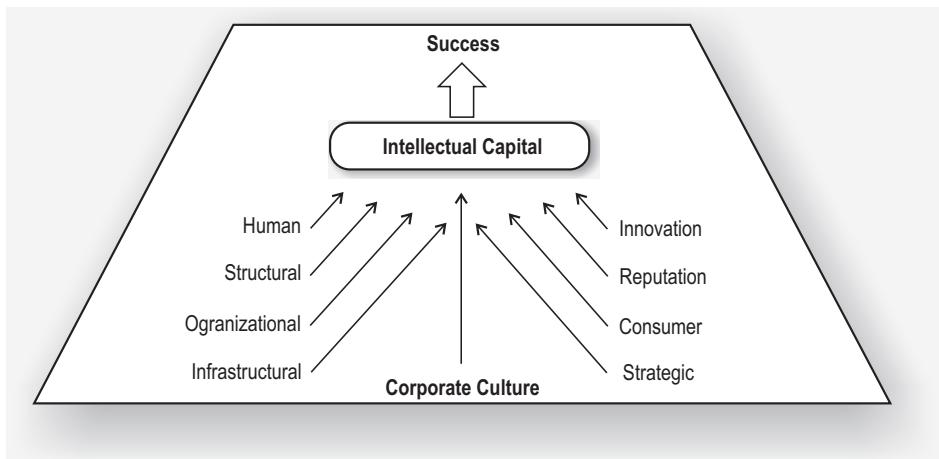
TABLE 2.11: TOBINS' COEFFICIENT FOR SELECTED MONTENEGRIN FIRMS

<i>Firm</i>	<i>Economic field</i>	<i>Tobins' coefficient</i>
A	Science-education	7,85
B	Consulting	7,12
C	Project	5,63
D	Connections and telecommunications	3,23
E	Oil distribution	3,12
F	Assembling and selling computers	2,84
G	Tourism	1,07
H	Trade	0,83

Source: Research conducted by authors

Mutual exchange of data, information and knowledge leads to the creation of new knowledge and to increase the existing fund of knowledge. It is believed that the creation of competitive advantage and ensuring sustainable development presumes a situation in which the learning rate is greater than the rate of change in the environment. In terms of the innovation process and innovation business, the creation of knowledge is essential, as well as its expanding

FIGURE 2.25: THE INTEGRATION PYRAMID OF INTELLECTUAL CAPITAL



and multiplying delivery (distribution), so the special role belongs to the *knowledge base*, necessary for the implementation of business processes, operations, overall innovation and investment projects. The knowledge base is needed in all these organizational levels. It is defined as a scientific (theoretical and methodological) knowledge, the art of their use, the problem-solving situation, the accumulation of their own and other people's experiences, and systematization in the form of competence. If the IC is viewed as a knowledge base, it can be represented in the form of integration pyramid, where it connects its own components to the business success of the company (Figure 2.25).

3.3 Capital Structure Of The Company in the Knowledge Economy

Some scholars point to institutional change in the labour market and changes in firm behaviour as the main reason for falling real wages for low-skilled workers in some OECD countries. New high-performance work-places and flexible enterprises stress worker qualities such as initiative, creativity, problem-solving and openness to change, and are willing to pay premiums for these skills (Table 2.9). Moreover, the weakening of trade unions in some countries may have a negative impact on the relative position of the least-skilled workers, because it has led employers to implement a low-wage strategy in which delocalisation and outsourcing are important elements.

Modern strategy of economic development is based on knowledge development (conditionally: science and technology), ie. on IC as the most competitive resource. Naturally, business economy is still based on the coexistence of the mass economy (the industrial age), and the knowledge economy (post-industrial age). The knowledge economy as so-called *third wave* (term by Aune, 2001) includes the following significant changes: knowledge becomes a major factor of production (with a growing share in the capital of the company), labor becomes less centralized and more oriented towards individual forms of organization, labor becomes more interesting and more flexible, and bureaucratic uniformity is replaced by sophisticated tools of systems integration and information management (Ibid., p. 45). Important for our analysis is P. Hawken's observation (1983, p. 35) that the fundamental difference between mass and knowledge economy is refracted through ratio between the mass (energy, raw materials, labor, equipment and organization) and information (cognitive), which is built into the product and/or service. Knowledge adds value to the mass production factors, that is, additional knowledge is built into the product and/or service. Therefore, "*application of knowledge and information adds a new quality to products: design, usability (functionality), durability, endurance, etc..*" (Ibid ., p. 36). A new development paradigm based on knowledge involves innovation (for constant specialization), prediction of the global and other changes, increasing the degree of knowledge embedded in the product, increasing the level of general education, appreciating the environmental aspects of sustainable development, knowledge as a property (*asset*), *input* (skills, competences) and *output* (innovation, patents, etc.), diversification of products and services, new products, and new production processes and so on.

Reviewing the company's capital structure in the knowledge economy can not ignore the classification of capital by P. Bourdieu (1986), which includes:

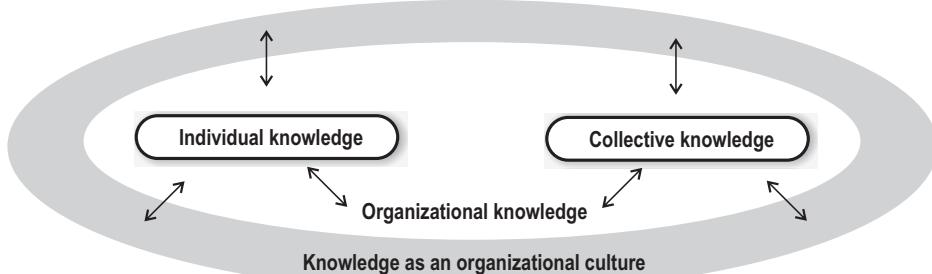
- *economic capital* (directly converted into money and institutionalized in the form of property rights),
- *cultural capital* (institutionalized through educational qualifications), and
- *social capital* (constituted through social "connections" and relationship with the environment).

TABLE 2.12: THE FLEXIBLE ENTERPRISE

<i>Traditional firm</i>		<i>Emerging flexible model</i>
Single centre	►	Multiple centres
Self-contained	►	Steeple of expertise
Independent activities	►	Interdependent units
Vertical integration		Multiple alliances
Uniform structure		Diverse structures
Parochial minds		Cosmopolitan minds
Emphasis on efficiency		Emphasis on flexibility

Source: Bahrami 1992.

FIGURE 2.26: LOGICAL MODEL OF KNOWLEDGE MANAGEMENT IN THE FIRM



Source: Kecmanovic-Cecez 2002, p. 897

Science intensity of economic branches and the resulting increase in share of intangible assets in the process of company's capitalization is characteristic of the modern economy, and "knowledge economy". Both in theory and in practice, information and knowledge are increasingly treated as a direct productive force (*immediate productive force*), and a strategic factor of production. Regardless of hypothesis based on mathematical modeling of the knowledge influence on economic growth and development, applied mathematical and statistical instrumentation and alternation obtained scenarios (results), there are only two important general conclusion: Firstly, investing in sectors of the knowledge economy is more profitable than others, and Secondly, the positive impact of that investment on GDP growth in the long term is greater than the corresponding impact of investment in other sectors (Makarov 2007, pp. 50-1).

Using different data sources, V. Meljancev (2001, p. 4) has noted some interesting changes in the structure of total capital (physical and intellectual) in western countries and Japan during the last two centuries (1800-1998). In 1800, the ratio between physical and human capital was 80% : 20% and constantly changing in favor of human capital. At the end of the last century, this ratio was 31% : 69%. Interestingly, in 1950 the ratio was almost identical (52% : 48%). In the period 1913 – 1998 it was completely reversed (from 69% : 31% to 31% : 69%). The same author states that by the end of the last century, the number of computers increased from 2,000 to 200 million, and all of the owners were Internet users (Ibid., p. 5). It is believed that the flow of information exchange over Internet doubles every hundred days, because in 2000, the transaction costs of sending information by e-mail were less than usual by dozens or even hundred times. Today they are probably less to up to a thousand times.