

# KNOWLEDGE - KEYSTONE OF THE MODERN ECONOMY

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# CONTENTS

<b>PREFACE</b>	I
<b>Part 1: THE NEW ECONOMY</b>	1
1. THE KNOWLEDGE SOCIETY	4
<i>Box 1 - What is Knowledge Society?</i>	9
<i>Box 2 - Sustainability Paradigm, Knowledge Society and Sustainability Metrics</i>	10
<i>Box 3 - Understanding the Knowledge Society</i>	12
2. PARADIGMATICS OF NEW ECONOMY	13
2.1 Economic Theory and the New Economy	16
2.2 The New Economy and Progress	19
2.3 Paradigm of the New Economy Skills	22
2.4 The New Economy and the Choice	25
2.5 The Characteristics of the New Economy	28
2.6 Information as a Specific Resource	32
3. OLD AND NEW ECONOMY	37
3.1 Information Asimmetry	42
3.2 Transaction costs and information	44
3.3 Information Technology and Economic Performance	45
3.4 Analysis of the Differences Between the Old and New Economy	46
4. THE NETWORK ECONOMY	51
<i>Box 4 - Exploring Network Economics</i>	59
4.1 A Network Clustering of the Economy	63
4.2 The Process of Value Chain in the Network Economy	68
<i>Box 5 - Transparency in the Networked Economy</i>	71

## IV KNOWLEDGE KEYSTONE OF THE MODERN ECONOMY

<b>Part 2: THE KNOWLEDGE ECONOMY</b>	<b>77</b>
1. PARADIGMATISM OF THE KNOWLEDGE ECONOMY	82
<i>Box 6 - Knowledge Economy Form and History</i>	84
1.1 Concept, Types, Characteristics and Importance of Knowledge	87
<i>Box 7 - What is the Impact of Knowledge Set Free?</i>	93
1.2 Innovations	97
<i>Box 8 - The Innovation Death Spiral</i>	100
<i>Box 9 - Innovation Models</i>	102
<i>Box 10 - Management Innovation</i>	108
1.3 Process of Innovation	110
1.4 Innovations and knowledge economy	114
1.5 Institutional effect on innovations	116
1.6 Montenegro and Croatia Case	118
2. CONCEPT OF SOCIAL CAPITAL	120
<i>Box 11 - Definitions of Social Capital</i>	132
<i>Box 12 - Social Capital: Prospects for a New Concept</i>	134
3. CONCEPT OF INTELLECTUAL CAPITAL	135
<i>Box 13: Impacting Future Value: How to Manage Your Intellectual Capital</i>	142
<i>Box 14 - Intellectual Capital Statement</i>	147
<i>Box 15 - Intellectual Capital: Current Issues and Policy Implications</i>	149
<i>Box 16 - Intellectual Capital: Defensive and Offensive Roles</i>	150
3.1 Skandia Navigator	151
3.2 Components of Intellectual Capital	154
3.3 Capital Structure of the Company in the Knowledge Economy	164
<b>Part 3: THE KNOWLEDGE MANAGEMENT</b>	<b>167</b>
1. CONCEPT OF KNOWLEDGE MANAGEMENT	169
<i>Box 17 - Multidisciplinary Nature of KM</i>	182
<i>Box 18 - Individuation</i>	187
2. MODELS OF KNOWLEDGE MANAGEMENT	187
2.1 Models of Knowledge Transformation	197
2.2 The Knowledge Creation	200
2.3 Organizational Learning	202

<i>Box 19: A Conceptual Model of LO and KM</i>	209
2.4 Strategic Knowledge in the Function of Developing Dynamic Capabilities of the Company	211
3. THE KNOWLEDGE APPLICATION	213
3.1 Bloom's Taxonomy of Learning Objectives	216
3.2 The Knowledge Application at Various Levels	219
3.3 The Knowledge Reuse	221
4. INNOVATION OF THE KNOWLEDGE PROCESS	226
<i>Box 20: Innovation processes and knowledge processes</i>	232
4.1 <i>The Knowledge Flow and its Dynamics</i>	233
<b>SUMMARY</b>	237
<b>REFERENCES</b>	241
<b>INDEX</b>	
<b>REVIEWS</b>	263
<b>LIST OF FIGURES</b>	
1.1 MARKET EQUILIBRIUM FOR NETWORK GOODS	
1.2 HIERARCHICAL ORGANIZATION AND NETWORK CONNECTIVITY	
1.3 THE DIFFERENCE BETWEEN THE INDUSTRY AND NETWORK ECONOMICS	
1.4 MARKET EKONOMY MODEL AND NETWORK EKONOMY MODEL	
1.5 MASS PRODUCTION OF KNOWLEDGE: EVOLUTION OF MAIN FACTORS OVER TIME	
1.6 RESOURCES AND CAPABILITIES OF A FIRM	
1.7 A CORE COMPETENCE AS A UNIQUE BUNDLE OF INTANGIBLE ASSETS	
1.8 BUSINESS PROCESS VALUE CHAIN	
2.1 LEVELS OF ATTENTION GIVEN TO THE KNOWLEDGE	
2.2 STRUCTURE OF THE NEW PARADIGM OF KNOWLEDGE	
2.3 HIERARCHY OF KNOWLEDGE	
2.4 THE PROCESS OF CREATING KNOWLEDGE - ONTOLOGY ASPECT	
2.5 ESSENCE OF INNOVATION	
2.6 THE PROCESS OF INNOVATION	
2.7 MODELS OF INNOVATION	

## VI KNOWLEDGE KEYSTONE OF THE MODERN ECONOMY

- 2.8 MODEL OF SUSTAINABLE DEVELOPMENT STRUCTURE IN THE KNOWLEDGE ECONOMY
- 2.9 DEVELOPMENT FORMULA OF KNOWLEDGE ECONOMY
- 2.10 SOCIAL CAPITAL FRAMEWORK
- 2.11 LEVELS OF SOCIAL CAPITAL
- 2.12 ELEMENTS OF SOCIAL CAPITAL
- 2.13 CONCEPTUALIZATION OF SOCIAL CAPITAL (DEVELOPED BY GROOTAERT AND VAN BASTELAER)
- 2.14 CONCEPTUAL FRAMEWORK: LEVELS AND TYPES OF SOCIAL CAPITAL
- 2.15 CONCEPTUAL FRAMEWORK: LEVELS AND TYPES OF SOCIAL CAPITAL
- 2.16 NETWORK OF RELATIONSHIP: AN ENGAGING EXPERIENCE
- 2.17 COMMUNITY SOCIAL CAPITAL MODEL
- 2.18 SOCIAL CAPITAL IS ONE OF THE THREE MAJOR BUSINESS CATALYSTS
- 2.19 SKANDIA NAVIGATOR
- 2.20 SKANDIA'S CLASSIFICATION OF THE INTELLECTUAL CAPITAL
- 2.21 COMPONENTS OF INTELLECTUAL CAPITAL
- 2.22 RELATIONSHIP AMONG STRUCTURAL ELEMENTS OF INTELLECTUAL CAPITAL
- 2.23 RELATIONSHIP AMONG INTELLECTUAL CAPITAL, INTANGIBLE ASSETS AND INTELLECTUAL PROPERTY
- 2.24 INTELLECTUAL CAPITAL FRAMEWORK: ITS RELATIONSHIP TO MARKET VALUE
- 2.25 THE INTEGRATION PYRAMID OF INTELLECTUAL CAPITAL
- 2.26 LOGICAL MODEL OF KNOWLEDGE MANAGEMENT IN THE FIRM
- 3.1 INTERACTION BASIC FORMS OF IC
- 3.2 KNOWLEDGE MANAGEMENT GOAL PYRAMID
- 3.3 DIAMOND OF KNOWLEDGE
- 3.4 HUMAN, ORGANIZATIONAL, AND TECHNOLOGICAL FACTORS OF KNOWLEDGE MANAGEMENT
- 3.5 LIFE CYCLE OF THE KNOWLEDGE MANAGEMENT AND ORGANIZATION
- 3.6 MODEL FOR KNOWLEDGE & COMPETENCE MANAGEMENT
- 3.7 SPIRAL MODEL OF KNOWLEDGE CREATION
- 3.8 THE COMBINED MODEL OF KNOWLEDGE - CYCLIC (PHASE 4), AND THE SPIRAL OF KNOWLEDGE
- 3.9 ORGANIZED LEARNING MODEL
- 3.10 INTEGRATED KNOWLEDGE MANAGEMENT CYCLE
- 3.11 KNOWLEDGE HIERARCHY
- 3.12 KEY ELEMENTS OF KNOWLEDGE BASED ENTERPRISE

- 3.13 NONAKA KNOWLEDGE FLOW THEORY
- 3.14 EXTENDED MODEL WITH KNOWLEDGE FLOWS

**LIST OF BOX FIGURES**

- B1 KNOWLEDGE AND SUSTAINABILITY INDEX
- B2 ALICIT'S PILLARS OF THE KNOWLEDGE SOCIETY
- B3 POSITIVE FEEDBACK
- B4 NETWORKED ECONOMY
- B5 TRANSPARENCY IN THE NETWORKED ECONOMY
- B6 CHANGING ECONOMICS OF THE INFORMATION-BASED ECONOMY
- B7 KNOWLEDGE FLOW CYCLE
- B8 DOMAINS OF KNOWING
- B9 WHAT IS KNOWLEDGE
- B10 COMPETITIVE INNOVATION MATRIX
- B11 DIFFERENT TYPES OF INNOVATION NETWORKS
- B12 MANAGEMENT INNOVATION PROCESS FRAMEWORK
- B13 A CONCEPTUAL MODEL OF SOCIAL CAPITAL
- B14 CLASSIFICATION OF INTELLECTUAL CAPITAL
- B15 FIVE-STEP INTELLECTUAL CAPITAL MANAGEMENT MODEL
- B16 UNDERPINS CAPABILITIES AND CORE COMPETENCIES
- B17 VISUALIZING THE RELATIVE IMPORTANCE OF KEY RESOURCES
- B18 ICS STRUCTURAL MODEL
- B19 CONCEPTUAL ROOTS OF INTELLECTUAL CAPITAL
- B20 DETERMINING THE ROLES FOR INTELLECTUAL CAPITAL
- B21 INTERDISCIPLINARY NATURE OF KNOWLEDGE MANAGEMENT
- B22 DEVELOPMENTAL PHASES IN KM HISTORY
- B23 INDIVIDUATION
- B24 A CONCEPTUAL MODEL OF LO AND KM

**LIST OF TABLES**

- 1.1 INDUSTRIAL AND NEW (INFORMATION) ECONOMY
- 1.2 KNOWLEDGE ECONOMY AND MASSIVE ECONOMY
- 1.3 THE DIFFERENCE BETWEEN "OLD" AND "NEW" ECONOMY

## VIII KNOWLEDGE KEYSTONE OF THE MODERN ECONOMY

- 1.4 DIFFERENCES BETWEEN THE INDUSTRIAL ECONOMY AND THE KNOWLEDGE ECONOMY
- 1.5 DIFFERENCE BETWEEN NETWORK AND HIERARCHICAL ORGANIZATIONAL STRUCTURE
- 1.6 KEI FOR SELECTED COUNTRIES IN 2012
- 2.1 CHARACTERISTICS OF TRADITIONAL AND INFORMATIONAL RESOURCES
- 2.2 COMPARATIVE VIEW OF KEI AND GCI INDEX (FOR INSTITUTIONS) BASED ON THE POSITION IN THE RANK LIST IN 2012
- 2.3 SOCIAL CAPITAL DEFINITION
- 2.4 DEVELOPMENT OF I.C. CONCEPTION
- 2.5 YEARS, AUTHORS AND WOKRS IMPORTANT FOR DEVELOPMENT I. C. CONCEPTION
- 2.6 MARKET VALUE OF THE ORGANIZATION STRUCTURE
- 2.7 COMPONENTS OF INTELLECTUAL CAPITAL
- 2.8 DETAILED STRUCTURE OF I.C. FIRM
- 2.9 COMPARATIVE REVIEW OF THE BASIC INTERPRETATION OF I. C.
- 2.10 CLASSIFICATION OF INTELLECTUAL CAPITAL
- 2.11 TOBINS' COEFFICINET FOR SELECTED MONTENEGRIN FIRMS
- 2.12 THE FLEXIBLE ENTERPRISE
- 3.1 VARIOUS SCHOOLS OF KNOWLEDGE MANAGEMENT
- 3.2 THE PROCESS OF CONSTRUCTION; USING, TRANSFORMING AND IMPLEMENTING THE KNOWLEDGE
- 3.3 ORGANIZATIONAL LEARNING AND MARKET POSITIONING
- 3.4 BLOOM'S "COGNITIVE DOMAIN TAXONOMY"
- 3.5 REVOLUTIONARY STEPS IN STORING DATA

### **LIST OF BOX TABLES**

- B1 PROGRESS IN CONCEPTUALIZING INNOVATION:  
ROTHWELL'S FIVE GENERATIONS OF INNOVATION MODELS
- B2 TYPOLOGY OF INNOVATION NETWORKS TYPE OF INNOVATION PRIMARY  
PURPOSE / INNOVATION TARGET NETWORK
- B3 DEFINITIONS OF SOCIAL CAPITAL

# PREFACE

*"The soul of an economy knowledge is a constant striving for innovation; the source of its power is education. In today's world, the competitive power of the states essentially represents a competition of the knowledge level".*

Li Tein

In the last 15 years, the importance of the many issues related to the knowledge and its management is rapidly growing, both in academic and research circles. There is a growing importance of global processes, regardless of their advantages and weaknesses, or their causes and consequences. They produce the capacity for competitiveness in the global market, as the most important component of the economic power of some states, regardless of the mutual state dependence, as a result of globalization. The success and stability of modern companies predominantly depend on the continuity of innovation. It imposes a shortened life cycle of goods and services. Economic growth and development depend on the continuity of technological revolutions that change the structural characteristics of the socio-economic relations. In all these fields, *a knowledge is obligating component*, and therefore it imposes, among other things, the idea of its *paradigmatics*. *A paradigmatic knowledge* is indisputable today for several reasons, but primarily because of its dominant importance for the future of humanity and sustainable development. In addition, another reason is the number of theoretical concepts containing knowledge:

- the concept of knowledge as the only unlimited *resource* and the key factor for sustainable development,
- the concept of knowledge as a *product*, because production of knowledge is the most important determinant of modern economics,
- the concept of *codified knowledge*, which becomes the most important component of the economic relations,
- the concept of *economy knowledge* and *society knowledge* as the most important consequences of an information society development, and
- the concept of the *new economy* (hereafter n.e.) as questionable theoretical and methodological construction, found in the jargon and articles of many authors.

The economic and social reality is changing and becoming more complex very quickly. Those changes are adding up. They establish and develop new connections between individuals, companies, organizations and states. A complexity, uncertainty and variability of the environment are the only constant components in the life of organization. Under those circumstances, the sustainability of any business system requires knowledge, its use and continuous growth. This is also the reason to accept the idea of *paradigmatic knowledge*.

Thoughts about the actual economic functioning of post-industrial type (n.e.) and the knowledge society, as well as post-communist „transition type“ drew our attention, while writing this text, on the three important questions:

*First:* How to achieve efficient business, economic growth and sustainable development in practice (or how to overcome the crisis);

*Second:* Does n.e. in theory mean new paradigm or not; and

*Third:* What are the key conditions (institutional or other) that determine the significance and role of knowledge in society?

The answer to the first question involves adjustment and use of other exemplary models. The answer to the second question is a belief that n.e. creates a new paradigm, but only in the strategic management (V. Draskovic 2003, p. 30) and in the department of economic practice, in terms of need for *paradigmatic change* the way of thinking of economic agents and their behavior. The answer to the third question is the result of our long research of respective neo-institutional economies and use of its positive ideas and results in the developed countries and economies. Regardless of all other necessary conditions, there is no doubt that the character of the institutional conditions is fundamental in determining the importance and the role of knowledge in a society and economy.

In view of the new paradigm, it seems that n.e. deserves that title only in terms of creating a completely new economic reality, business skills, new nature of the company, its structure and organization. A contract approach has revived the company role as a „black box“, where resources go in, combine, and then come out as a final products. N.e. raises new questions to the economic science, and the most of them are contradictory: Why within the company, as a market subject, operate more and more non-market ventures (intra-company transfer)?

No matter how more or less *paradigmatic significance* has been affixed to n.e., period of its creation caused significant and revolutionary changes, which have been scientifically monitored, analyzed and researched. Economic science and economic reality have entered a new epoch long time ago, which can

be defined as pluralistic institutional and economic synergetics. It rests on the evolution of complex, dynamic, open and virtual business systems based on the principles of flexible self-organization, equal and „floating“ (mobile, temporary) cooperation between partners and limited autonomy. It is expected that the rapid changes of the economic reality (influenced by n.e.), the structure of contradictions, priorities, value system and criteria, affect the development of many new directions of economic thought.

Knowledge, fundamental and applied science have always changed the world for the better. They have solved most of the development problems. The importance of market knowledge, as the element of economy knowledge, is exceeding the importance of Material Flow market. In this way, the role of the effective knowledge management is gaining importance.

This manuscript points out:

- the growing role and value of the knowledge in creating a competitive advantage in modern turbulent conditions, where the only certainty is uncertainty,
- the imperative necessity of forcing its maximum and the broadest use at all levels and in all segments of society,
- the need for continuous learning and acquiring new knowledge, without whom sustainable development of economy and society would be hard to imagine,
- the fact that developed institutional environment is the most important condition for creating a successful model of knowledge use and management,
- the need for civilized relation towards the knowledge,
- the need for adequate investment in knowledge, expansion of knowledge and specialization of existing and available knowledge,
- the need for productive use of other people's knowledge and innovation to the highest extent,
- the need for an impartial selection, evaluation, and appreciation of knowledge at all levels and in all sectors of society, and
- the need for a critical attitude towards the quasi-knowledge.

In this manuscript many important research aspects of knowledge were ignored, such as creating the conditions for its reproduction, mental models in the system knowledge, innovation business, detailed analysis of the conceptual definition, business intelligence, etc. We could have not avoided certain functional repetitions, because it would damage the meaning -and concept of the

author's texts, published in various journals. We felt that some of them should be partially, edited and/or completely saved from oblivion by presenting it in this text and adjusting it to the title. We decided to do so only because of the dominant importance of knowledge for social and economic development, and belief that it is never possessed enough by anyone.

From the point of modern science and methodology, all or almost all has been already written about knowledge. The knowledge is a scientific field which is extensively analysed in the international literature from the perspective of many scientific disciplines: economics, organization, management, computer science, psychology and others. This is an attempt to briefly systematize its extensive holdings and its conceptualization in one manuscript, directed to adjust the focus the emphasis of the importance of *paradigmatic* knowledge. Therefore, the text is mostly clear. In our conditions there are no funds for scientific research, nor possibilities for a some new and original explanations of so significant, multidisciplinary and multidimensional phenomena such as knowledge and its many aspects.

We believe that our message about the need for maximum enforcement and application of knowledge, as well as other numerous messages in this manuscript, will motivate some of the readers and students to focus on researching, creating and expanding of it. That would be the most beautiful appreciation of our efforts made in writing and shaping this text. The future will only exacerbate the stated need for knowledge. That is particularly important in the current situation of hyper-producing graduations without real coverage in knowledge. Hopefully, in this region will soon really respect and motivate knowledge, not just mention it, rhetorically and formally, in the media, and essentially bypass the reality. We believe that the evaluation criteria and standards of knowledge transfer should and must be at the highest possible level, in every way. This is the only solution for a successful future and for overcoming all of the crisis. In the field of knowledge there is no room for improvisation, omissions, concealment and manipulation.

From methodological point of view, this manuscript is based on data, views, researches and analysis of well-known authors in multidisciplinary field such as knowledge. The subject of research is to explain the main trends of modern development in areas dominated by knowledge and affirmative relationship with it in n.e., the knowledge economy and knowledge management. It is a civilization and paradigmatic breakthrough and the phenomenon that deserves a comprehensive consideration. In accordance to the subject, there is a *scientific research problem*, which consists of:

a) analysis, research and explanation of all significant contemporary phenomena, factors of influence, development trends and strategies related to knowledge and

b) efforts to, in some basic and final considerations affirmatively and/or critically review some of the elements that characterize successful role model of development, implementation and management of knowledge.

Basic premise and two auxiliary hypotheses are determined by the subject and the problem of scientific research. The basic hypothesis is: *the dominance of knowledge, and its importance in modern society and economy, essentially determine the competitiveness on the corporate and national levels, representing the factors of definition and success of development vision, strategies and appropriate policies on the micro and macro levels.*

Auxiliary hypotheses are: first, *the development of knowledge, in addition to investment and other influencing factors, needs to develop and stabilize institutional conditions,* and second, *the paradigm of knowledge led to its revolutionary creation and implementation at all levels of the economic, political and social reality, and the new phenomena in economics called new economy, knowledge society and knowledge economy are just a result of its essential nature - paradigmatic.* The main goal of the research is to:

- provide a new approach to the problem of knowledge, through the prism of gradual connection of the new economy, the knowledge economy and knowledge management,
- systematize and comparatively analyze the most important current theoretical and empirical approaches to the subject topic,
- show the relevant theoretical and methodological stances known by the subject area,
- show the development of modern tendencies and phenomena related to the knowledge,
- explain the importance of paradigmatic knowledge and the need for its implementation,
- send the main message of this book about developing knowledge, creating new knowledge, and appreciation of its maximum application, as imperative.

We have tried to provide a scientific contribution in terms of a number of research limitations. This contribution will get the best evaluation by our readers and critics, and may be found in:

#### XIV KNOWLEDGE KEYSTONE OF THE MODERN ECONOMY

- analysis and synthesis of extensive theoretical materials, many models of knowledge, definitions and attitudes of knowledge, and the ways of its usage as the part of organized learning,
- the original conception of the manuscript, which is functionally focused on the above-mentioned revolutionary paradigmatic knowledge and motivation for further research, and
- the original, modified and/or adjusted graphic modeling, focused on emphasizing basic function of knowledge by providing opportunities for effective and innovative action.

We hope that we've fully verified this hypothesis with its relevant scientific attitudes, their classification, functional and comparative analysis that we've conducted and drawn conclusions. Whichever empirical research we carried out, it would show that the knowledge level in most of the transition countries (where we belong) is not sufficient. Therefore, it is essential to learn more and more, and to acquire new skills and apply them in practice. That is the basic message and the target function of this book. It surely points out that "a knowledge is power", but only in a developed institutionalized environment. An ignorance is a weakness.

But the ignorance (conscious or unconscious) can sometimes be used as a successful and interesting method of a primitive tool of so-called „elite“ and alibi-reformers for initiating a mass delusions, confusions, replacement thesis, etc. And it may sounds (and it is) absurd, paradoxical and illogical. Examples are numerous. The first one is pushing a quasi-institutional monism (economic vulgarized neoliberalism) and ignoring institutional pluralism. The second example is imposition of the „expert“ opinions. That is the most recent global, financial and economic crisis, caused by so-called excessive public spending and uncontrolled growth of wages (not that the main causes are banks and financial markets with uncontrolled flows of capital and virtual, unreasonable securitization in the real estate market). The third is a rhetorical denial of government regulations in elementary functions, with taking the project funds from the government project funds "out of hand." The fourth is the declaration of the small business operations, (which has never even been a craft) and some sort of science courses (!). It is about lifting and lowering a boat, using a fire extinguisher, training on a simulator that is outdated for a decade, compared to the children's computer games and alike. „Instructors“ for mentioned „skills“ receive enormous sums ranging from a few to 17 thousand € every 2-3 months, in accordance to the rule book, which allows the unrealistic number of hours per day (over 100 - value for Guinness).

This manuscript is structured in three parts, forming a compact unit and logical step in the historical, research and methodological point of view. A consideration of paradigmatic knowledge begins with the characteristics and phenomena of n.e., the knowledge society and economic network, further expanding of the knowledge economy and its major determinants (knowledge, innovation, intellectual and social capital). It ends with many complex aspects and models of knowledge management.

Through the prism of the relations between our limited resources and enormous needs for new knowledge, we are aware of not achieving the results that can generate and create new knowledge and innovation. That should not diminish the importance of this manuscript for a larger audience, for several reasons.

*First*, this manuscript represents a huge, nearly decade-long effort in processing extensive bibliographic material, selection, structuring and translating the texts of many known and recognized authors in discussed field, as well as composing and synthesizing a large number of interpretations, applications and models of knowledge and related categories.

*Second*, this manuscript completely, from cover to cover, indicates an urgent need for scientific civilization advance towards acceptance of knowledge, determining the *paradigmatic* knowledge, which is why the book is so entitled, as well as transition from the „destructive construction“ (the term of D. Stojanov) towards Shumpeter’s „constructive destruction“.

*Third*, this manuscript, as a guideline, refers to all relevant social structures, acting and decision-making levels of the necessity for an unconditional acceptance of this new paradigm of knowledge as a development imperative in all social and economic sectors. Therefore, he warns that any disregard, bypass and substitution of knowledge leads astray, and calls for crises and developmental delay. Uncritical attitude toward knowledge, in all its forms, is the same as its neglect and denial. Minor investment in knowledge produce similar effects, it is known that developed countries allocate 3-4% of theirs GDP on research and development, plus on various forms of education, research for the military and cosmic industry, etc. Intellectual capital can not be created in the conditions of neglected knowledge, ignorance and negative personnel selection.

*Fourth*, this manuscript should draw the attention of young researchers, and motivate them to deepen, improve, expand, develop and scientifically shape themselves in many understated aspects. It is desirable to direct them into a new research of knowledge and innovation.

*Fifth*, this manuscript should help students and all concerned readers to adopt modern concepts and principles of knowledge, to understand its extraordinary, strategic importance and its contemporary and future role.

The finalization of this manuscript was contributed by an expert advice, suggestions and reviews of inspiring and distinguished professors of economics, to whom we are very grateful:

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***Evgeny Popov***, Member of Russian Academy of Sciences, Chief Secretary of Ural Branch of the Russian Academy of Sciences, Russia, and

***Miomir Jaksic***, University of Belgrade, Faculty of Economics, Serbia.

We are very proud to announce that this is the first book published by the recently-launched international publishing house The Scientific Publishing Hub.

# Part 1

## THE NEW ECONOMY

In the history of the human society, developmental stages have changed, characterized by specific dominant economic and social reality. They responded with the specific developmental levels of civilization. They have always had significant differences. Conditionally and generally interpreting, they were naive optimism of antiquity, religious mysticism of the Middle Ages, rational scientism of industrial society and modern globalism of post-industrial society. The above classification ignores a number of „elastic“, permeable boundaries (temporal, geographic, and others.) and transitional periods in which „collisions with the future“ (A. Toffler’s term) occurred. Each of these stages had its own development paradigm<sup>1</sup> with the appropriate criteria and values. They revolutionarily changed (with different dynamics in the space and time), exactly during those long transitions between stages. Each new historical period required (mostly paradigmatic) change of thoughts and behavior. Basically, it was adjustment to civilization norms, achievements, and challenges (V. Draskovic, 2002, p. 11).

Pace, extent and dynamics of modern changes, that have brought globalization and information society, are more revolutionary than ever. Generally, dynamic of change and technological change are especially dominant feature of today. It was followed by the creation of a super-active development strategies and appropriate activities for their realization. They are based on the idea of progress as a permanent process of development of knowledge and science, followed by the formation of new social structures and organizations. Innovative organization is based on continuous learning, i.e. specialization of existing and new knowledge, which are a function of the application and/or the creation of new technologies. Without innovation, changes have cosmetic character and they are short term. Constant innovation, evolutionary and revolutionary, is necessary for the development. The pace of change is increasing exponentially. Technological renovation is indispensable in every industry and/or organiza-

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<sup>1</sup> Paradigm is a Greek word (παράδειγμα) which means an example for the reputation, a role model, a pattern, but could be used in a different sense. In our case, it refers to the fundamental economic theory that dominates in given time (period) of its development. Basically, each paradigm is a general idea or a concept, which could be expressed by a) initial or original concepts and b) system of ground principles, the law, or sufficiently probable hypothesis.

tion that strives for success, survival and sustainable development. Therefore, the choice of modern business is very simple: „To be quick or quickly forgotten!” Technological progress is supported by constant expansion of capital, its investment into profitable business and awakened competition. That is how new developments and technological progress is stimulated, as a result of knowledge. It has virtually limitless potential to create and improve everything that exists. Technological innovations affect the significant improvement of company performance, creation of competitive advantages and competencies. New technologies create new opportunities, remove barriers to international trade and investment, increase transparency and diversification opportunities, intra-corporate exchange and virtualization. Innovations in information technology, computer networks, telecommunications and transportation systems have contributed to connecting the market at all distances and areas. New quality development is based on an extraordinary technological growth in the last quarter of the XX century in the field of automatization, informational technology, telecommunications, transportation, biotechnology, genetic engineering, and aero-cosmic technology. The leaders are the global “boom” of information, communication, and transport monitoring. Technological superiority is usually accompanied by modern organizational skills, marketing and managerial know-how and expansion of the service sector. As a result of the technological revolution, the share of services in creating GDP is increased. The best example is the U.S. with 73% in 1990 (Statistical Abstract of the United States 1995, p. 452).

The growth of service activities is accompanied by corresponding changes in the structure of employment. The labor force is more focused in the service sector, whose share of employment have long exceeded 70% in developed countries. According to the Bell’s foresight from 1967 (p. 102), economy will transform from dominant production of goods to the dominant production of services, class professionals and specialist technical profile will become the largest group of employees and intellectual institutes will become the leaders. It is believed that the future is in the growth, based on knowledge and innovation (but not in the growth of so-called “innovation sectors”, as some authors misinterpreted). The third knowledge revolution occurred with the Internet. It enabled completely new way of management and organization, based on productive use of knowledge. Internet is essential tool for the normal functioning and survival of the market and people in general. Knowledge has become easily available and relatively cheap for everyone. Anywhere and anytime, it is there, hovering in the air around us, in the unlimited computer space, primarily due to the rapid development of the World Wide Web. Knowledge revolution is spreading at a tremendous speed. It can not be isolated, or restricted.

Information infrastructure enables expansion of the knowledge across the world almost instantly. Education has turned into an extremely efficient “technology”, which monitors all modern updates. Knowledgeable people make the organizations different, more or less successful (or unsuccessful). In the companies, knowledge has become a priority and strategic resource. But, it requires new ways of organizing. Operations must be performed untraditionally, which requires flexible and innovative (often virtual) forms of organization, producing the groundwork for a constant flow of creative achievements.

New economy, (hereinafter n.e.) based on the knowledge, has created the new rules of business. As defined by the neoclassical production, function, output in old economy is the result of inputs used: land, labor and capital. While these traditional inputs still play a role in the new economy, knowledge is the most important factor of production. According to classical economics, traditional resources as a source of competitive advantage are prevailing. In n.e. the comparative advantage is based on innovative activities, the most important source of knowledge transfer. While the old economy depends on continuity (Chandler, 1990), n.e. provokes changes and thrives on them. Innovation is present in both cases. The difference is in the nature of innovation (incremental and radical). N.e. is characterized by an extreme volatility. It's all in the motion, with a large number of new companies emerging every year. It is based on heterogeneity. The world of homogeneous economy promotes expansion, rather than innovation. In a heterogeneous population, each individual has a unique set of information. New ideas are likely to occur through communication in heterogeneous than in homogeneous world. The main feature of working in a heterogeneous environment is dealing with uncertainty, as it replaces a predictability. The work and working environment are changing, so everyone who is able to deal with uncertain situations is more valuable. Therefore n.e. motivates people to participate in the creation and commercialization of new ideas. Almost unprecedented phenomenon has formed in terms of the knowledge economy - an open economy virtualization, its dematerialization and great independence of national borders. At the expense of human capital and knowledge there is enormous growth of high-tech companies and Internet companies capitalization. The market value of the shares exceeds their annual profits by hundreds of times. Fundamental changes in human knowledge are hypothesis of the new world perspective: a holistic, global, ecological, human and collective. On this basis a new culture is born, a new understanding of the world, a new philosophy and a new value orientation.

The current development trends and the global economy shows that the comparative advantages of geography is based not only on inputs found on

technological innovation, but also on intangible assets such as style, brand, design, aesthetic and symbolic value. New era of development as well as new economy is dominated by knowledge, creativity, skills and originality. This causes a change of integrated development paradigm, economic and social, accepted by all who sincerely wish to develop. Economic, political, civil and social power in the world will not be determined by the amount of resources owned by some social and/or national community, nor its size and economic power, but knowledge and skills to efficiently increase its wealth and power to. It is no coincidence that the most powerful countries (economically, military, politically, etc.) mainly invest in knowledge. They have the highest level of development and the largest stock of knowledge and innovation, representing the appropriate award or recovery of the investment. Finally, the term n.e. was used in the 1980's to describe the sphere of production services. After 1990's it is used in two senses: first, as a part of the economy that make high-tech innovation sectors (communications, digital technology, IT applications in the media, etc.) and second, as the influence of high technology on the environment and changing certain macroeconomic and market parameters. As stated by K. Kelly (1998, p. 2) „*The world of sophisticated (virtual – author's note) technologies starts controlling the world of machines - the world of reality.*”

## 1. THE KNOWLEDGE SOCIETY

Socio-economic changes in recent decades are direct result of a strong scientific and technological development, especially in the area of information and communication technologies, which emphasize the role of knowledge - conditional intellectual capital. In 1960s, M. McLuhan wrote that the world has become a „Global Village” thanks to the modern electronic and communication technologies. He was referring to the growing electronic connectivity and networking of the companies and the people around the world. In the “knowledge society”, where everyone aspires, companies and national economies competitive advantages are based on the knowledge. Among the main developing goals of propulsive states are the increasing investment in knowledge and innovation activities through continuous learning and training of human resources.

The widest access to „knowledge society” was in the early 1960's. It focused on the growth of new industries based on science and their role in social and

economic change. Some analysts included the professional services and other information-rich industries, where employment growth is noticeable (Machlup, 1962; Porat, 1977, Stanback, 1979; Noyelle, 1990). Fundamental idea of unifying this working element is theoretical knowledge as a source of innovation (Bell, 1973). Expanding knowledge is included in the new theory of economic growth (Romer, 1986, 1990), noting that innovations differ from other inputs because they have no competition and they encourage further innovation.

The concept of “knowledge society” („*knowledgeable societies*”) was mentioned in 1966 by American sociologist R. Lane. Soon after that (1973) American sociologist D. Bell has also popularized the knowledge society in his book *The Coming of Post-Industrial Society*. Lane’s approach was closely related to the network access, as M. Castells (2000) noted that for the first time in the history, the basic organizational unit is no longer a subject but the network of related subjects. The structure of the “knowledge society” was first defined by the *World Bank Institute* in the program called “*Knowledge for Development*”. It included long-term investments in education, development of innovative skills, modernization of information and communication infrastructure and effective legal and economic (institutional – author’s note) framework, which should stimulate innovation, entrepreneurship and sustainable economic development.

Numerous changes have caused a significant transformation in the organizational behavior of understanding the necessity of learning and applying the new knowledge in all spheres of human activity. Therefore, modern society is now called the „*knowledge society*” or a „*learning society*” (in order to improve the knowledge). Under the „*learning society*” S. Ranson (1994) refers to „*a new moral and political order, which uses learning as the main tool for achieving historic transition.*” Constant process of learning and educating becomes an important form of modern human resource development. Knowledge is used as a crucial resource in the production and management of the complex processes (informational, organizational, projecting and other). Many agree that we already live in an age of information, although it is clear that the modern economies make the coexistence of *mass* (industrial) *economies of scale*, which, according to P. Hawken (1983) covers the period from 1880 to the present time and the *information economy* (knowledge economy). The above disciplines rapidly evolve because intellectual capital, knowledge, information, intellectual property and experience are unlimited and strategic resource, bringing a competitive advantage in the market (“*nuclear weapons in modern competition*” - T. Stewart). Knowledge has become the main factor of production, work has become flexible, and bureaucratic uniformity is replaced by sophisticated tools of systematic integration and information management, according to A. Aune (2001, p. 45).

Some economists (Bresnahan and Trajtenberg 1995; Rosenberg, 1976, 1982) regard information technology (hereafter IT) as a *general purpose*, such as telegraph, steam engine, and electric motor. Their true value derives from a series of complementary innovations and not directly from an original technology. Therefore, the profit of the general-purpose technologies is limited by managers skills to create new organizational structures and processes, rather than technological capacities (David 1990; Brynjolfson and Hit 2000). The introduction of new technology without adequate organizational changes could lead to significant losses in production, with potential negative interactions of existing organizational practice.

The large 20th century corporation was designed to meet the objectives of the increased production and reduced cost per unit of production. A. Chandler (1962, 1977) explained in detail the growth of the functional hierarchy and the associated multi-divisional structure and expansion of mass production, with detailed division of labor and delegation of administrative obligations. The role of managers in large bureaucratic company is „*created as a guardian of the organizational centralized knowledge base*” (Zuboff, 1995, p. 202). Technological changes that enabled gradual achievements in computer capacity were initially slow, bolstering the hierarchical, controlled organizational structure. Managers were struggling to control the information, relying their authority on them, even after the new IT created the opportunities for widespread distribution of information. Distributed knowledge can threaten the old base of managerial control. Profit from IT could not be achieved until the older, more centralized organizational arrangements were abandoned to develop alternative ways of organizing.

Recent studies on the “knowledge society” in part of organization and management claim that it corresponds to the flexible working arrangements (Kelly, 1998; Atkinson and Court, 1998.) They facilitate the involvement of workers and allow them to use their specialized knowledge in solving problems. In his article for the *People Management* magazine (2000) H. Scarborough (Leicester University Management Centre) has warned that „*the interpretation of intellectual management is not purposeful exclusively from the stand point of technological achievements and approaches.*” He underlines the importance of human resources and culture, which basically consists in the creation, transmission and dissemination of knowledge. Many authors focus on the intellectual network, which is interpreted as a “mobility of the intellect.” This corresponds with the basic development perspective of mankind, associated with the knowledge economy, which emphasizes the role of a modern education and science.

The advantage of the knowledge economy (n.e.) compared to the “standard” (traditional) economy based on the principle of alternation of resources is that sharing of knowledge creates the multiplication with no losses. This radically, even paradigmatically, changes the theoretical approach to the process of exchange. The main problem here appears to be the intellectual property rights, which requires upgrading the existing theory of property rights. Knowledge and innovation have become the key elements to understanding the society and its development. This must take into account the theoretical critique of “economy based on knowledge”, suggested by C. Vercellone (2006, p.p. 809-822), opposing its “cognitive capitalism”, i.e. the fact that the key role of knowledge is not some historical novelty *per se*. This is rather a matter of terminology but the essence, as the term “knowledge economy” specifically and accurately emphasizes the importance of modern knowledge, innovation and turbulent changes in the environment. Economy was always based on knowledge, but never so developed and crucial in all economic activities and society in general, nor was the social and economic development ever so dependent on the knowledge.

Other than popular terms of „*knowledge economy*“, „*innovative economy*“, „*knowledge management*“ and similar, the scientific principle based on IT and the corresponding technical (instrumental) questions of knowledge transferring through various types of links is still dominating. Of course, more is invested in the creation and sharing of knowledge, as well as its transferring by modeling the dialogue. Regardless of the enormous power of the IT industry, the knowledge and intellect are exclusively human. „Knowledge society“ is understood as the production of services based on intensive learning activities that contribute the acceleration of scientific and technological progress, but also the rapid obsolescence of innovation. A key component of the knowledge society is a greater dependence on intellectual abilities for research and development (R & D) laboratories than on physical and/or natural resources, i.e. on increasing the relative contribution of gross domestic product, attributed to „intangible“ capital (Abramovitz and David, 1996). Economists have noted that changes in the production moved from material to the immaterial and informational resources (Shapiro and Varian, 1999). Those sectors were based on the intensive knowledge and productivity growth (Brynjolfsson and Hitt, 2000; Gordon 2000). A “knowledge society” has to learn constantly (*life-long learning society*). That way, the quality of education is measured by the usefulness of acquired knowledge, skills and habits, necessary for the efficient and successful operation in the complex and exponentially changing conditions of a developed society (Pastuovic 2008, p. 17).

Several characteristics of the “knowledge society” differ from the industrial society. *First*, the form of the production organization has been changing. There is no need for a high concentration, because a man can now take the full part in the production process, even from the distance; *Second*, the importance of bureaucratic management is decreasing, workers are increasingly becoming independent in fulfilling their obligations; *Third*, the system of values is changing, because the public demands from the companies are not only economical solution, but also social (protecting the interests of consumers) and environmental issues (protecting the environment); *Fourth*, the role and importance of supranational institutions and supranational regulation has been growing. The dominant national feature of manufactured goods is fading; *Fifth*, international social networks are providing communication and information channels of connection, and various interactions among participants (exchanging information, material and non-material resources) and decentralized management; and *Sixth*, the term of network goods is emerging, characterized by complementarity, standards, the effect of production volume, specific network external effects (each additional user increases the usefulness of a network goods for other users), and the effects of traps (*lock-in effects*), mutually connected with technological dependence of both companies and industries (eg, different training on operating systems, Windows and Macintosh, the conversion of information from one program to another, the cost of connecting the device, etc.).

As the economic science becomes more formal, more instrumented and more severe (often tautological and too ideological), less attention has been paid to certain practical issues and problems of the economic environment (which were more interesting for the political economy and institutionalism). For example, theoretically perfect market and/or competition as neoclassical standards, where every distinction is considered pathological, although reality is completely different. Or sustainable development, directly opposite to the actual market prices, which are objectively far from being based on real externalities, so that they can not reflect all the environmental damage due to the market operations. There is a the growing conflict between competing economic objectives - efficiency and social justice, ignored by many practitioners (policy makers) and theorists (especially those with quasi-neoliberal orientation), considering it an ethical issue. In this respect, the economic theory is very much at odds with the practice. Transition events are a good example of the above reasoning.

Although the economic theory (such as it is, a comprehensive in content and disunited, consisted of theories) “bypasses” many essential and existential questions of economic reality and a many failures (faults) of economic policies (especially the quasi-neoliberal), we can not support the opinion of some au-

thors that is in crisis. We incline to explanation that this is a classical economic apologetic, not economic, ignorance. Economic apologetic, by its nature, limits possible action of economic science and allows expressing the private interests of its protagonist, so-called “economic reformers.” In this context, the economic science can always find a “justification” in the long lasting dilemma: Is it a science (and to what extent) or art? We can not neglect the fact that the number and the rate of changes in the economic reality exceed their capabilities and pace of study.

Undoubtedly n.e. and knowledge society largely decline and/or relativize the thesis of the eternity and universality principles (and myths) of “*the market choice and self-regulation*” and “*government-planning dictate*” (or “spontaneous evolution and cognitive control” in the jargon of F. Hayek). Because it modifies the market choice and verifies the convergence and the combination of competition (as the horizontal dimension) and economic necessity (as the vertical dimension), while on the other hand greatly reduces them by monopolization of production and market (intra-corporate exchange, online business networking and the like.).

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### **Box 1 - WHAT IS KNOWLEDGE SOCIETY?**

*The emergence of the knowledge society, building on the pervasive influence of modern information and communication technologies, is bringing about a fundamental reshaping of the global economy. Its significance goes well beyond the hyping of the Internet. What is underway is a transformation of our economy and society. Knowledge has always been a factor of production, and a driver of economic and social development. Earlier economies depended, for example, on knowledge about how to farm, how to build and how to manufacture. However, the capacity to manipulate, store and transmit large quantities of information cheaply has increased at a staggering rate over recent years.*

*The digitisation of information and the associated pervasiveness of the Internet are facilitating a new intensity in the application of knowledge to economic activity, to the extent that it has become the predominant factor in the creation of wealth. As much as 70 to 80 percent of economic growth is now said to be due to new and better knowledge. Information and communication technologies (ICTs) are also facilitating a rapid globalisation of economic activity. In an increasingly global economy, where knowledge about how to excel competitively and information about who excels are both more readily available, the effective creation, use and dissemination of knowledge is increasingly the key to success, and thus to sustainable economic and social development that benefits us all. Innovation, which fuels new job creation and economic growth, is quickly becoming the key factor in global competitiveness. Innovation fundamentally means coming up with new ideas about how to do things better or faster.*

*It is about making a product or offering a service that no one had thought of before. And it is about putting new ideas to work in enterprise and having a skilled work force that can use those new ideas. It is a further feature of the knowledge economy that it increasingly relies on the diffusion and use of information and knowledge, as well as its creation.*

*The success of enterprises, and of national economies, becomes increasingly dependent on the information infrastructure that is necessary for the gathering and utilisation of knowledge. The importance of broadband telecommunications infrastructure in this context must be recognised as no less significant than the importance of electricity to 20th century industrial development.*

*Knowledge has become the key resource. Knowledge has value, but so too does knowledge about knowledge. Creating value is about creating new knowledge and capturing its value. The most important property is now intellectual property, not physical property. And it is the hearts and minds of people, rather than traditional labour, that are essential to growth and prosperity. Workers at all levels in the 21<sup>st</sup> century knowledge society will need to be lifelong learners, adapting continuously to changed opportunities, work practices, business models and forms of economic and social organisation*

Source: <http://www.pragfoundation.net/concept/what-is-knowledge-society/>

## **Box 2 - SUSTAINABILITY PARADIGM, KNOWLEDGE SOCIETY AND SUSTAINABILITY METRICS**

*Sustainability is a notion which comprises the multi-criteria validation of the system. Sustainability is a metric of the quality of human life. It includes economic, environmental and social validation. It is understood that no generation will indebt any future generation's comfort.*

*Sustainable development encompasses economic, social, and ecological perspectives of conservation and change. In correspondence with the WCED, it is generally defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This definition is based on the ethical imperative of equity within and between generations. Moreover, apart from meeting the basic needs of all, sustainable development implies sustaining the natural life-support systems on Earth, and extending to all the opportunities to satisfy their aspirations for a better life. Hence, sustainable development is more precisely defined as 'a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.*

*This definition involves an important transformation and extension of the basic concept of physical sustainability to the social and economic context of development. Thus, terms of sustainability cannot exclusively be defined from an environmental point of view or based on attitudes. Rather, the challenge is to define operational and consistent terms of sustainability from an integrated social, ecological, and economic system perspective. This gives rise to two fundamental issues that need to be clearly distinguished before integrating normative and positive issues in an overall framework.*

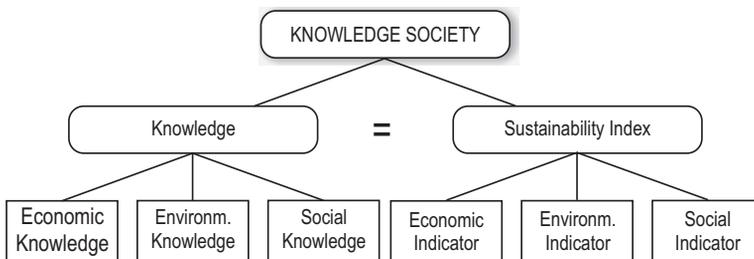
*Sustainability provides a framework for integrating economic, environmental and social interests into effective strategy. For life support systems that recognised the need to embrace sus-*

*tainable development the first step is to understand how to implement it. Putting this concept into operation requires identifying practical indicators of sustainability and understanding how it can be measured over time to determine if progress is made.*

*In order to verify the mutual relationship between knowledge society and sustainability, we have to consider the difference between these two terms. Since, knowledge society is based on the agglomeration of eco-knowledge, env-knowledge and soc-knowledge it may be evaluated as the complex knowledge of quality of life support systems. In order to do so, we have to introduce metrics which will allow us to present knowledge as the paradigm of the number of indicators to verify whether progress is made.*

*Sustainability metrics are designed to consolidate measures of economic, environmental and social performance of any system. It can be understood as a pattern for evaluation of the available knowledge about a system and its performance. In particular the decision-making process for selection of the system under consideration must be based on available knowledge. The link between knowledge and sustainability makes it possible to visualise that the sustainability paradigm is the essential frame of the knowledge society.*

FIGURE B1: KNOWLEDGE AND SUSTAINABILITY INDEX



*Since every life support system requires knowledge about its structure, efficiency, operation and maintenance, it is immanent to the knowledge base of the respective system to be organised as the object oriented system. Also, the sustainability of the same system is described by the appropriately selected criteria and corresponding indicators organised in the appropriate paradigm describing its functionality. The mutual relation between knowledge and sustainability reveals the possibility of anticipating the knowledge society as a sustainability paradigm. As shown on Figure B 1.2 the knowledge society is organised as the equity between the knowledge and sustainability index. These are structured with economic knowledge, environmental knowledge and social knowledge of the system. The Sustainability Index is composed of economic indicators, environmental indicators and social indicators as the basic indicators of sustainability, including material intensity, energy intensity, water consumption, toxic emission and pollutant emission. Complementary metrics within each of these categories can be developed as support for the need for the knowledge about area decision.*

Source: Afgan & Carvalho 2010, pp. 34-35.

**Box 3 - UNDERSTANDING THE KNOWLEDGE SOCIETY**

*It is commonly thought that knowledge has replaced industrial organization and production as the major source of productivity. The term 'Knowledge Society' generally refers to a society where knowledge is the primary production resource instead of capital and labour. It may also refer to the use a certain society gives to information: a knowledge society 'creates shares and uses knowledge for the prosperity and well-being of its people'.*

*Globalization and the changing world economy are driving a transition to knowledge-based economies. In particular, developing countries need knowledge-based economies not only to build more efficient domestic economies, but to take advantage of economic opportunities outside their own borders. In the social sphere, the knowledge society brings greater access to information and new forms of social interaction and cultural expression. Individuals therefore have more opportunities to participate in and influence the development of their societies. According to Evers (2000), characteristics of a knowledge society are:*

- *Its members have attained a higher average standard of education in comparison to other societies and a growing proportion of its labour force are employed as knowledge workers i.e. researchers, scientists, information specialists, knowledge managers and related workers;*
- *Its industry produces products with integrated artificial intelligence;*
- *Its organizations - private, government and civil society - are transformed into intelligent, learning organizations;*
- *There is increased organized knowledge in the form of digitized expertise, stored in data banks, expert systems, organizational plans, and other media;*
- *There are multiple centres of expertise and poly-centric production of knowledge; and*
- *There is a distinct epistemic culture of knowledge production and knowledge utilization.*

*The concept of 'knowledge societies' includes a dimension of social, cultural, economical, political, and institutional transformation, and a more pluralistic and developmental perspective. It is regarded as a human process. UNESCO argues that progression from Information Societies to Knowledge Societies requires that 'use of ICT must be linked to the recognition that knowledge is the principal force of the social, political, cultural and institutional dimensions of development, founded on human rights.*

FIGURE B2 -ALICT'S PILLARS OF THE KNOWLEDGE SOCIETY

KNOWLEDGE SOCIETY			
Education	ICT	Innovation	Science & Technology

*As the status of information and knowledge are different in a knowledge-based society, the*

*vision of what knowledge people need to acquire, and how they can acquire it, also needs to change. Knowing where knowledge is located and who has access to what kind of knowledge and why are becoming increasingly important. Social skills and 'relationship capital' become key skills for employment in the knowledge economy. Such skills are increasingly exercised using ICT. There is thus a need to skill both the workforce and the unemployed to increase their ICT literacy. These efforts need to be an ongoing part of lifelong learning, since a dynamic and fast-changing knowledge-based society requires continuous skills updating.*

Source: GeSCI 2011.

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## 2. PARADIGMATICS OF NEW ECONOMY

Challenges, consequences, possibilities and limits of n.e. are large and numerous. They deserve scientific attention and a phenomenological approach, especially in explaining its paradigmatic character. This section explains some of the theoretical and practical aspects of n.e. as a metaphor that reflects the spirit of the post-industrial-information era, through the prism of valuation and phenomenology of its paradigmatic. It gives answers to some current issues in relations of n.e. and economic theory, progress, civilization approaches, skills, business and economic choice. In terms of theory, our analysis shows that the n.e. paradigm is highly questionable, because there are no objective elements that prove its existence. Traditional laws, principles and categorical apparatus of economic science are still valid and active. Basically, n.e. has not changed.

Therefore, it can not hold the title of paradigmatic theory, knowing that it significantly reduces the choice as the essence of the economy, creating top competence of individual economic subjects (monopolists), forcing intra-corporate exchange and network partnerships, representing the modern sophisticated "naturalization" of goods and money relations and restricting competition. In practice, IT, telecommunications, innovation, organization, globalization and other developments and events undoubtedly make the economy "new", even in the paradigmatic sense. The latest technological revolution (especially in the field of communications and transport, which use micro-processors, fiber optics, databases, computers, digital networks, lasers, etc.) has great economic impli-

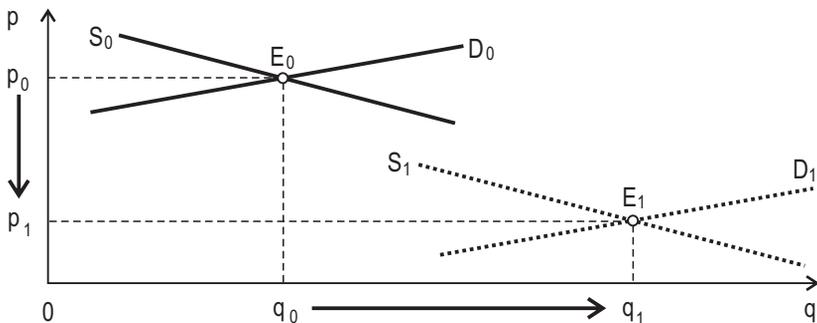
cations. The most important is creating the basic infrastructural requirements for the so-called post-industrial (post-Fordist) era, that relativizes the number of differences (spatial, temporal, cultural, ethical, political, ideological and others) and verifies the theory of convergence, but not the economic convergence.

Through the knowledge and information, waves of globalization are persistently surging. By the end of last century, the service sector has become globally dominant with 61% in the value-added GDP (*World Bank*, 1999), with a tendency of accelerated expansion. Innovations in the field of IT, computer networks, telecommunications, and transportation systems, have contributed to connecting markets at all distances and boom international capital movement, goods, services, people, ideas and cultural values. In such conditions, the economy is nowadays called weightless, informative, networking, digital, technotronic, E-economy, etc. It is believed that F. Machlup was the creator of the information society concept. In his study "*The production and distribution of knowledge in the United States*" (1962), he noted that "*knowledge industry represents 29% of the total national output,*" (according to Clark, 2004). The term n.e. is the synergic unity consisting of knowledge (intellectual property), digitalized communication and information, the Internet, online business networking with the very permeable boundaries, innovation, virtual and dynamic connecting, intra-corporate exchange with reduction by eliminating intermediaries and markets, global competition, Web electronic business, flexible manufacturing systems and organizational structure, ownership and partnership, etc. (Kotlica, 2000, pp. 197-199). In addition to these, the new trends are forming new economic sectors, modifying classical forms of work, eliminating and/or relativizing the traditional vertical hierarchy and horizontal structure of organization, changing the structure of employment and moving towards the service sector, multiplying human knowledge by accessing, processing and distributing the information, automatising business transactions, experiencing a real boom of e-commerce, online banking services and electronic media. The effect on the economy is variable, but here are some positives: less time to conduct business transactions, reduced operating costs and prices, increased revenue and profit, reduced engaging of the business assets, increased productivity, more efficient inventory, better and faster handling customers and so on (Bjelic, 2001, p. 29).

Paradigm of n.e. is reflected in the practical sense and the fact that the high-tech has directly influenced the economic environment and has changed some common laws, primarily the market. Since the network goods can not be practically manufactured at zero marginal costs and since they manufacture external network effects for users, it leads to a non-traditional behavior of supply and demand. It is well known that the standard (neoclassical) economic

theory exhibited behavior of manufacturers and customers across the supply and demand curves. The supply curve has a positive slope (because of rising marginal costs that are in its basis), and the demand curve has a negative slope (because of diminishing marginal utility of goods). In the situation of network goods, supply and demand curves are changing their traditional places. The supply curve  $S_0$  has a negative slope because of the marginal costs tending to zero in significant intervals, while the demand curve  $D_0$  has a positive slope, because the marginal utility of network resources increases the extent of growth in the amount of users. If the process is to be developed with the current pace in the long run, the curve will tend to the equal coordinating point that represents decreasing price and increasing amounts.

FIGURE 1.1: MARKET EQUILIBRIUM FOR NETWORK GOODS



Source: Adapted from Strelets 2006, p. 166

Figure 1.1 shows that the equilibrium market price decreases from  $p_0$  to  $p_1$  and the equilibrium quantity from  $q_0$  to  $q_1$ . Market equilibrium is moving from the point  $E_0$  to the point  $E_1$ . This way, the network good increases its value in proportion to the growth of its quantity, and thereby its price declines in proportion to the growth of its value for the customers. So, the highest value in terms of the knowledge society has the goods to be provided free of cost! It is a paradoxical conclusion, but only at first, because we are not talking of any goods, but the network goods, which are essential to the knowledge society. Above mentioned cases already exist in practice: *Microsoft*, *Netscape* and other provide their browsers for free. Not to mention piracy in the area of software products and their free copying.

There is another phenomenon, important for the knowledge society, linked to the creation of new monopolies, such as *Microsoft*, based on knowledge and innovation. C. Shapiro (1999, p. 352) has shown that a combination of the volume effects on the side of supply and demand reinforces monopolistic tendencies. In addition, there is another paradox: monopoly in the market for information products increase production volumes and reduce costs! The first 5Mb hard drive in 1956 costed \$50.000 (which means that the 1Mb costed \$10,000). From early 1980's to today, the price of hard disk capacity of 0.1 GB was reduced from \$20,000 to \$300 (1000 GB). So, in 30 years (1980-2010) 1Mb price was reduced from \$200 to \$0.0003 or 666,666 times! And in the period of 1956-2010 as much as 33.3 million times! It seems unlikely, but it is true.

## 2.1 Economic Theory and The New Economy

**T**he economic theory is a scientific generalization of facts and evidences about the processes and phenomena that occur in the economic reality, therefore the term n.e. can only refer to the new conditions of economic reality, ie. to the specific and new forms of organizing economic activities created under the dominant influence described in the Foreword. N.e. can not be identified with the new economic doctrine (study about something exposed as a system; a set of theoretical conception reviews) because it is not based on the principles and states, but is dynamically formed, modified, adapted and evolved.

Unlike the economy seen as an economic theory or economic science, which is the theoreticaly and methodologicaly limited (abstract, relative, hypothetical, pluralistic, delayed in explaining the phenomenon, ideological, model instrumentalized, open to changes), n.e. represents the sum of the economic reality manifestations. As such, it has its own specific and/or virtual organizational forms, developmental logic, laws of existence and changes of the "outside world." The task of modern economic science is to explain a variety of problems, processes and phenomenology of n.e., to research and find its most general, fundamental principles of the economic activity organization in their tight mutual dependences and links with social, political, ideological, institutional, cultural, ecological, ethical, and other processes (eg. the attitude towards the market economy, competition, entrepreneurship, corporative management, ownership, state regulation, certain forms of social and economic system, sustainable development, etc.).

The similarity between economic theory and n.e. can be sensed in *the use of synthetic and multidisciplinary knowledge*. It allows adjustment to the general laws of economic development, improving the mechanisms of functioning and organization of macro and micro-economic (business) systems (at the national and international level) and the affirmation of the rational economic behavior principles. While economic science, as a teaching discipline, *synthesizes* the science achievements and explains the law of business and mechanisms of its implementation, methods of economy and competition, economic politics, problems and contradictions of different economic area (ie. the behavior of the people in the process of economic activities in order to efficiently use the limited productive resources and/or their management), n.e. exclusively represents the form of their expression (realization, manifestation). There is another similarity between economic science and n.e., referring to a smaller or larger ideologisation. M. Castells defines n.e. as the “*new capitalist economy*”, bypassing the areas that are not profitable (according to: V. Draskovic 2002, p. 24).

Economic science is interested in all modern economic problems (inflation, unemployment, government spending, energy crisis, regional differences in development, external debt, budget deficit, hunger, poverty, inequality, environment pollution and so on.). N.e. is interested only (or mostly) in achieving the competitive advantages, competence and agreeable business success, expressed through a variety of target indicators (profit), which is possible (achievable) through the best functionality, organizational, time and spatial combining the limited factors of production and alternative modes of their use. Most interpretations of the economy as a science of rational choice is based on the definition of L. Robbins: The economy studies human behavior as a relationship between unlimited targets (human needs) and scarce resources which have alternative uses. Interestingly, the authors of the most modern economy textbooks praise L. Robbins, forgetting that long time before him, the reverend Thomas Robert Malthus had pointed out the limitations of food (as a resource that is being developed by the arithmetic progression) in relation to population growth as the carrier of the needs (increased by geometric progression). Though, it seems that the holder of this ideas is Malthus.

Since economic theory studies the functioning of the economy (business), n.e. is understood as specific and modern form of business. The economic theory, among other things, must have n.e. phenomenology as an object of its study. In other words, the economic theory is the “philosophy of economy”, which explores the types of economic behavior, organization and economy (in general, and n.e. in particular), their evolution, goals, criteria, and forms of ownership and contract, the system of interest, subject motivation of economic busi-

ness, etc. Nobel Laureate M. Allais pointed to the “*necessity of synthesis and unconditional submission to practice*” of modern economic science, alluding to its abstractness and increasing specialization in various fields (price theory, institute, risk, money, development, international exchange, market equilibrium, rational behavior, and so on.). In his opinion, this specialization is necessary and desirable, but it must take into account the necessity of scientific synthesis. Full objectivity in maintaining the practice is impossible (because it is impossible to draw conclusions about the relationship between people and objects, as he put it), but it is necessary to make efforts to get as close as possible. In this sense, Allais (1989, p. 27) stands for “*reapproachment of the economic theory to the reality and finding a basis on which to build a normal economic and social policy.*”

However, n.e. is the practical phenomenon to be respected and scientifically analysed, particularly with regard to the need for the adjustment of the local entrepreneurial behavior, as well as the actual economic policy. The economic theory must always be open to the changes in the actual practice. The changes that n.e. brings are certain and predictable in some way: dynamic, complex, uneven, informatively rich, technologically modern, and innovatively intense. This reality of n.e. must be respected and implemented in all development plans, based on the assimilation to the external environment, possible retention of its specific features and the need to maximize its usefulness. Because n.e. nolens-volens, appears as a new social-historic and economic environment, which (in conjunction with globalization as its generator) relativizes even national sovereignty, institutions of state regulation and the applicability of every economic theory with its explained phenomena. The new original theory, based on the appropriate paradigm, can not be reviewed.

N.e. is based on a synthesized thought, the multidisciplinary scientific approach, the relativized scale value criteria, the overcoming of one-sidedness and exclusiveness, the latest scientific and technological achievements, but it does not create a new theory of economic paradigm, which would modernize and enrich economic science, ie. economic thought. In the past there have been a few original and scientifically established theoretic economic paradigms: physiocrat, mercantilist, classical, Marxist, institutional, Keynesian, neo-classical, new-institutional, etc. Regardless of all errors, complaints, and conceptual-methodological contradictions, all above economic theories have been analyzing complex economic reality, the choice as a way of solving contradictions in economic reality and original economic motives.

Modern economic theory solve the same problems in terms of the complex n.e. and its dynamic changes. Heterogeneous world of economy have never been theoretically explained as homogeneous and uncontroversial construction. Especially in a very complex and virtual world of n.e. From the *ontological* point of view, through economics research, it is clear that the post-industrial era had already occurred in economically developed countries. The focus of business is transferred to the service sphere. Limited (and therefore strategic) resources have become information and accumulated knowledge. The market economy and “homo economicus” do not vanish, they are significantly replaced by neetwork and virtual economy, e-commerce, intra-corporate exchange, creative specialists of free individuality and one partner inequality (replacing hierarchical). Modern economic activity, however, creates certain ontological assumptions for creation of the *post-industrial paradigm*, which is often equated with n.e. Through the prism of industrial and post-industrial relations, it is clear that the first subject has exhausted themselves. This means that the economies in crisis (such as ours) on the road to recovery should need to be focused on post-industrial values and principles of economy. Of course, no less significant are *gnoseological assumptions* of the new paradigm, because post-industrial civilization has a strong influence on the development process. Although a formal logic, dialectic method, systematic approach, mathematical method (linear programming, etc.) have their scientific importance in economic science of post-industrial era, it seems that the increasing significance of information, business networking and virtuality put the emphasizes on the dominance of analytical models, system-structural and functional analyses, as well as the other modern methods for the information processing. The unilateral monistic approaches give way to more complex - pluralistic methods (Nureyev 1993, p. 144).

## 2.2 The New Economy and Progress

**M**an and society always strive for progress. Progress is natural, historical and legal process. The ground for social progress is an economic development. Hence the need to constantly study the factors and the laws of economic development (variable in time and space) and to explain the process and phenomena of the past and the present, in order to predict the future, to reduce the uncertainty and stochasticity, and to identify the driving forces of socio-economic progress. N.e. advances thanks to the new and original meth-

ods of business, organization, communication, processing and distributing the information, thoughts and actions. Its success is based on overcoming, equalization and neutralization of differences in development, culture, nation, politics, and the like., on the harmonization of business interests and differences, and on the convergence of polarized socio-economic systems. N.e relies on the *globalization* of the development goals and activities within its domain. Out of this context emerges the essential question: Is this the only way to reduce or increase the original contradiction of economic reality between the unlimited human needs and limited natural resources? Analysis of a many authors, from various aspects, would give different and contradictory answers.

N.e. corresponds well with the civilizational approach, that views the development of society through the prism of all aspects of social life and relationships, and the economy as a subsystem, which has a) the organizational and technical-economic aspect (where economic relations are focused on the rational and efficient use of available resources ), and b) the socio-economic aspects (where economic relations are determined by the character of ownership relations). In practice, n.e. solves those issues and uses them, taking into account:

- complex relations and influences between economic, social, political, cultural, and other subjects in economic activities,
- multidisciplinary scientific and systematic approach,
- relativized scale of values and standards,
- developmental specificity (different conditions and levels of development),
- virtualization of the business relationships,
- flexibility of deadlines, spatial dimensions, specific organizational forms, conditions of partnership cooperation, etc.

The unilateral conversion of the characteristic (*unification*) into their true oneness (*unity*), long observed by A. Toynbee (1934, p. 150) is a modern reality, fully supported by n.e. It has become a criterion of civilization, despite the achieved level of economic development, the respect for historical tradition, social motivation, institutional form, democratic achievements and human rights. The necessity and affirmation of civilization methodological approach to social development was influenced by many evolutionary and revolutionary (term used by T. Kuhn, 1974), changes in the capitalist and socialist systems (which, after lengthy ideological polarization, affirmed the principle of their convergence), and the latest scientific and technological achievements. In this way they overcome outdated notions of linear, non-alternative and determined development.

The traditional scheme of production factors<sup>2</sup> and economic growth (labor, land, capital), absolutism of any kind of ownership, old-fashioned interpretation of government's socio-economic role and one-sided "messianic" monistic theory of development (liberalism, monetarism, etc.). These concepts maximally respects rapid technological advances and the increasing importance of the service (and information) component of economic growth, and a variety of environmental, social and other limits.

We probably can not discuss the "*creation of an entirely new civilization in the broadest sense of the word,*" as metaphorically envisioned by A. Toffler (1980, p. 30), but we must acknowledge n.e as a formation of *new development concept*, which is free of many traditional burden. In terms of development, n.e. can objectively aspire to a new paradigm. It fundamentally changes all areas of life and business, as well as the general social form. In his study (1982) *Mega-trends: ten new directions that change our lives* (1982), I. Naisbit has predicted many of the dominant tendencies of the 80s and 90s: the transition from the industrial to the information society, from the "forced technology" to the "high human element", from national economy to the world economy, from short-term to long-term orientation, from centralization to decentralization, from institutional help to self-help, from representative democracy to participatory democracy, from hierarchical systems to socializing systems. In his later book, *Mega-important choice: variants of tomorrow*, (1985, p. 13-6) Naisbit has all of these trends collectively encompassed in the most important characteristic of our age: "*the transition from choice – either-or to a society with a wide range of choices.*"

We can not agree with the latter as a universal principle. It is questionable, not only the society *coverage* that have a wide range of choices, but the *freedom of choice*, which is often stifled and reduced in various ways, at all levels (individual, local, national, international, and global). The reduction of choice is directly proportional to the institutional vacuum, which is, unfortunately, widespread and prevents the development of many countries and regions. Using the term *post-industrial society* (also known as cybernetic, information, Third Wave civilization, ecological, post-collective, humanitarian, post-optimal, technotron, digital, etc.), we must be aware of its limitations, imperfections and conditionality, particularly with regard to its *prevalence* in the world. Although n.e. provides

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2 Converting information into important production resource undermines, in some way, the labor theory of value, extends the scheme of production factors and causes many of the practical consequences. Technology expels people from different fields of material production sphere, which is reflected in the social system (through higher unemployment, etc.). There is a whole complex of issues related to the revision of the original role of labor in creating the surplus products, for the ability to measure the value of different information services based on abstract labor, etc..

great opportunities for concretization and the self-proving, there is a significant (say perhaps fatal) gap between the developed and developing world in application of its positive effects.

According to the Pareto principle, modern economic science agrees, in a variety of ethical and democratic principles, that the maximizing behavior of economic entities is allowed only if it does not jeopardize the interests of the other participants. Their economic interests are protected by legal norms, whose development measures the “rule of law” development. In this perspective, the law represents a compromise between economics and morality. The analysis of this n.e. aspect exceeds the scope of our subject, but we are convinced it would lead to a dramatic and disappointing results, only discernible in the media. Ethical and economic analyses would include many issues such as: a review of the application consistency of the market business principles and privatization operations, evaluation of new values, distortion and reduction of competition, exploitation of resources, the level of contradiction between private and public interests, acknowledging the standards of professional ethics, disharmony of material and human values, the position of small and developing countries, causing environmental problems and so on.

### 2.3 Paradigm of the New Economy Skills

Many authors attribute paradigmatic significance to n.e., not in theory but only in a practical sense. Those are the key elements of this “*new scientific paradigm*”. In this self-developing capability of processing information (in terms of size, complexity, and speed), A. Dragicevic and D. Dragicevic (2003, p. 36) see its ability for recombining and decentralized flexibility. So, we can rather speak of technological paradigm (informational, communication, transport) than economic, where the first applies to n.e., which is based on this paradigm and receives a dominant influence from it. We disagree with B. Ilic’s conclusion (2004, p. 115) that “*a new economy emerges in theoretical ... sense*”, because it is, among other things, contradictory even to his (Ibid., p. 106) prior understanding that “*it does not eliminate the economic laws*”, but only “*demonstrates a new quality of economic growth and reveals new opportunities for cooperation and development*”. It seems that n.e., at least in some segments, (eg, the competition), significantly reduces the choice and economic laws, but it does not

formulate the new ones. This may be its greatest paradox, because it generally increases awareness and essentially broadens the horizons of choice. Clearly, there is a discrepancy between the apparent and the real, which is logical in the various levels of selectivity and asymmetric of information.

Economic reality drastically changes under the influence of the high tech. There are new forms of production, business and organizational relationships, increasing the complexity of the system, integration, virtuality, spontaneity, communication, alternation, independence, adaptability, globality, innovation, dynamism, organization, and institutionalisation, and reducing conflicts, predictability, module dependence, hierarchical managing, and bureaucracy. In accordance with relativizing reduction and competition, and the increasing virtualization of business networking, n.e. characteristics:

- providing the flexible conditions for business partnership,
- fairly reward participants in the activity with the agreement,
- protecting the property rights, entrepreneurship and innovation,
- systemic, organizational and business adaptability,
- warranty time of the business cooperation,
- relativization of the spatial distance,
- the speed and reliability of the communication and control,
- dynamic adjustment of the partnership,
- narrowing the boundaries of the organizational hierarchy, and
- overcoming the conflict between “*freedom of union and freedom of competition*” (M. Friedman).

After physiocratic, mercantilist, classical, Marxist, Keynesian, neoclassical, monetarist, institutional, new-classic and new-Keynesian economic theory paradigm, the question is if we can, in the same sense, speak about theoretical *paradigm* of n.e.? Epithets like information, virtual, network, digital, participatory and “teaching” the economy, do not represent a new theoretical structure, which could be marked as a new economic paradigm (regardless of the consistency level, applicability and abstractiveness of those economic paradigms). N.e. does not offer a new theoretical concepts nor contradict the old and the current. Obviously, there is no need for that. Because, on its modern and technologically intensive form of business, it realizes its own goals, traced by its creators. The economic experts are expected to identify similarities and differences in existing economic models, and to eventually upgrade and adapt them to the new phenomenons, contradictions and paradoxes (perhaps the largest of them is the global market expansion and the competition reduction of intra-corporate exchange and various forms of partnership and cooperation network).

The whole economic history is about finding a perfect economic system, and trying to achieve it. M. Jaksic (2005, p. 65) points out the utopian character of such attempts to create an exclusive and unique economic model. Rather than utopia, he prefers the evolution system, and rather than a “*big order*” - the complexity of the various systems. There is no universal or meta-economic theory and paradigm for all the times. In practice, there is a particular *economy* in terms of business, based on the skills, knowledge, development strategies, and economic policies, rather than on theoretical abstractions from textbooks.

In terms of economics as a skill (many agree that economics is not a science but *art*, seen as the art of business), the original pragmatic can be attributed to the n.e. J. N. Keynes (J. M. Keynes’s father) emphasized the *skill of economy* as a third dimension, which balances economic policy as a positive (what it is) and normative economics (what it should be). In terms of positive and normative economics, we feel that n.e. does not have an adequate theoretical paradigm, only the skills and economic policy (macro and micro). In this regard, we support the notion M. Jaksic (Ibid., p. 67) that “*the methodology of economics skills is more complex, less deterministic, implying the knowledge of institutions, business and society network.*” It is various in time and importance, it is dynamic, diverse, adaptable and respects priorities. This context emphasizes *paradigmatic skills* of the n.e., which directs the development in accordance with the actual circumstances in the region. The key impact on them is information and communication technology boom and a corresponding rise in the service industry.

N.e. with its concrete practical manifestations bypasses well-known paradigm of theoretical economics, and even the institutionalism in some paradoxical way: the leading actors are forcing the freedom of personal choice, based on the availability of modern technologies, limiting the range of others, to whom those are not available. But it has nothing to do with the theoretical economics, it is just a *new paradigm of domination and exploitation*, incarnated in so-called global competition. Its motto is the group-partnership application and top competence of the most developed in relation to the others, supranational institutionalization and control, as well as overcoming many differences (dominance of economic interests), while retaining and enforcing the most important differences - in economic development and power (absence of economic convergence).

While controlling (and globally eliminating) the competition, the expanding of the power and transforming it to the omnipotence becomes a matter of technology (operational), tactics and strategy. Only through the techniques and technology - information, communication, transport and others, could be achieved

a competitive advantage, dominating the market and increased the property. Therefore, the secret of the economy, if it exists at all, is not even in the market, nor in the property, but in the competition, as underlined by Russian and American academics (1994) on a round table discussion in Moscow. N.e. has outstanding growth performances, based on intensive development and practical paradigm, where superiority becomes powerful competence, taking on a global character in many segments. In this context, the new practical aspects of its paradigm are springing. Its analysis is beyond the scope of this topic, noting that the need and necessity of adjustment have no alternative for.

Changes are acting fast, they rotate and alternate practical aspects of the economic paradigm. There are conflicting opinions on these aspects, but the *original economic motives* remain eternal and unchangeable. Economic science is too slow in search of explanations for dynamic business practices. Economy as a science is too interdisciplinary and politically subordinated to frequently change and define paradigmatic theoretical models that would be universally accepted. The future is uncertain, it essentially depends on the economy and politics, but more and more of the human relationship to environment, morality and economic institutions. But apparently – it largely depends on knowledge and innovation. Although “*there is an eternal truth that everything will pass away*” (Russian proverb), the era of *timeless paradigm of knowledge* is coming. This may be the most important lesson for the suffering population of post-socialist and underdeveloped countries. The largest paradoxical virtue of the n.e. is investing in the collective (networking) values and relationships through the affirmation and valuation of individual knowledge. Only the knowledge has no barrier. It is the greatest opportunity and the challenge of the future.

## 2.4 The New Economy and the Choice

Most authors agree that the essence of economics is the choice, beginning with the limitation of resources. Efficiency, rationality and other forms of economic behavior are seen in the context of functional choices. Free economic choice has always been and remains an unfulfilled ideal for many economic agents, no matter how needfull, democratic and natural. In the way of free economic choices there were many restrictions, influencing its reduction: a pseudo-market structures (*monopoly power*), government intervention (*government*

*controls*), social goods (*public goods*), the external effects (*externalities*), market fiasco (*market failures*) and asymmetrical information (*asymetric information*).

While the essence of theoretical economics is in the analysis of choice, the essence of n.e. practice is in the globality. At the national level, the essence is in a monopolistic tendencies to reduce as much choice, especially in the competition as the basic problem, which should be overcome by creating a top competition and international market control. The plurality of business relations in economic reality is exceeded in interest, virtual, network, organizational, computer, communication, innovation, strategic and other ways, with the number and complexity of elements, a number of contradictions, cultural and other differences, etc. Formalism, sophistication, volatility and non-procedurality of the partner collaboration, as well as combining knowledge, skills and competencies are used to eliminate possible competition, creating a key and/or top competition, and reducing the share cost and risk, for easier access to the missing resources etc. If the essence of the economy is in the choice, then in terms of reduced choice (in some segments related to the n.e.) reduces the economy itself. Does it mean that n.e., which is largely focused on eliminating economic competition (creating a partner networks and so-called “global” competition as a transparent facade, bypassing the regular economic laws and rules of behavior by virutalization, intra-corporate exchange, monopolization, etc.) represents the more reduced economy in recent business practice?

The answer based on science needs a broader analysis and elaboration. In this case, we tend to ignore scientific caution and strive to a positive response. Because, the intra-corporate export exchange is globally huge – in 1993 it was 33.3% (*Unctad*, 1995, p. 193), and today it is much higher, although it is difficult to determine the actual amount. The laws of the free market are not valid within the transnational corporations, but they dictate an internal price. Taking into account their number, branching, size and economic power, it appears that only 1/4 of the world market operates in a “free” market, while the other 3/4 cover command-corporation, intra-corporate and network “planning” system. Globally, there is a unique, convergent and reduced economic system, which is a combination of strategic planning and market regulators. On the other hand, there is an opposite but logical question: What would actually happened in the conditions of ideal and complete choice? Could it disappear, as B. Loasbi believes? Would only stimulus and response remain (M. Jaksic, *Ibid.*, p. 66)? We believe, however, that there would be a choice, even then, because it is immanent to the human nature. There is no need to go from one utopia to another, assuming impossible things, such as a Loasbi assumed the certain future, in which, according to him, there would be no choice.

In addition to analyzing the choice of routes (ways) for exploiting the limited resources that society has to meet the growing and virtually unlimited needs (as alternative and competing goals), and complex economic reality (which is in constant transformation), economic theory studies the *original economic motives*. They are not a subject to change, even in the long run. Seen through the prism of the basic interests-profit motives of n.e., the economic motivation remained virtually the same. According to that criterion we can not talk about n.e. This does not diminish the need for significant changes in the thematic issue of economic theory, caused by the appropriate dynamization of certain changes in economic reality, created under the direct influence of the n.e. phenomenon, or a series of new economic processes that are innovation-accelerating and improving.

Network business networking significantly reduces the economy, because in principle it uses three factors of production: information (*software*), human knowledge and infrastructure (*hardware*). It increases their mobility, multi-functionality and flexibility. The network economy depends on traditional economic laws, such as the economies of scale, because the value of the network increases with the number of its users. This phenomenon changes the usual representation of the rarity as the ground for usefulness ("value"). On the other hand, the classic trade is exceeded and it modifies traditional concept of the markets, because a large part of sales transactions are electronic, in the virtual expanse. Physical contact is replaced by the digital, increasing information awareness of the exchange participants, asymmetry of information loses its significance in the middle and lower levels. The economy of information differs from the economy of things, in terms of retention and transfer of ownership, possibility of copying, storage costs, and obsolescence.

The economy as business is organizationally, structurally and functionally transformed. And the theory of marginal usefulness is questionable in the case of production and distribution of digital products. Services are no longer the only kind of intangible value. The market, in the true sense of the word, becomes a conversation dominated by the importance of the customer. The buyer highly pays his eventual desire to follow the changes and innovations, which affects his standards. The structure of need, knowledge and value is drastically changing. Although the new theoretical economic paradigm is not yet created, the old paradigm is reviewed and collapsing, even its most general segments. All this happens in a short period of unprecedented polarization and paradox, between marginalization and globalization, individualism and synergism, institutional disintegration and operational integration, freedom and dictatorship, liberalism and protectionism, totalitarianism and democracy, tolerance and intolerance, creativ-

ity and improvisation, construction and destruction, openness and interdependence, competition and monopoly (merged by unical competence), conservative and revolutionary, developmental continuity and discontinuity, rejecting the old and creating new boundaries, rhetoric and reality, economics and politics.

## 2.5 The Characteristics of the New Economy

The term n.e. has appeared in the mid 1980s articles relating to the *information economy* and the *knowledge economy*. D. Bell has created the concept of post-industrial information age, later renamed to Information Society. It involves the society transition from manufacturing to services economy where theoretical knowledge, technology and information would become the main product. Apart from expensive manufacture, its advantage is the cheap reproduction. However, it is believed (Ilic, *Ibid.*) that it formed in the late 20th century. This period coincides with the transition from Third to Fourth scientific and technological revolution, ie. from the industrial to the information economy.

The term n.e. is used in the same sense as the term knowledge economy. In this context, the modern society is called information (due to the domination of information as a new factor of production), the knowledge society, the mega-society, communication society, techno-society, digital society, etc. The basic characteristics of n.e. are:

- information production basis (information becomes the most important factor of production),
- fast-changing products and services,
- flexible production systems,
- network organization of production,
- integration,
- services followed by the products,
- knowledge, skills generalization, and skills
- education, knowledge and talent, as the most important factors for socio-economic growth and development.

Many authors agree that n.e. represents the set of industries characterized by high technological achievements and dominant production of services in the globalized business environment. According to Ilic (*Ibid.*), n.e. is founded on

three principles: *complexity* (emergence, influence, system components, non-linear process, dynamic structure), *chaos* (as an offset of “creative destruction” - J. Shumpeter), and *synergy* (no internal system conflicts; the whole is stronger than the sum of its mechanical parts).

The importance of information in n.e. system is explained by the perception of the organization as a quality of the relationship (not the physical distribution of functions and responsibilities), ie. the ways of establishing links within it. These connections are better if the flow of information between the organization elements, which are faster. Some characteristic manifestations of n.e. are:

- material production requires fewer people employed,
- new and better global communication infrastructure,
- the new products, intelligent work and production tools, applicable in a humane workplace,
- free capital is plentiful and circulates in the world, and
- entrepreneurial spirit.

TABLE 1.1: INDUSTRIAL AND NEW (INFORMATION) ECONOMY

<b>Industrial economy</b>	<b>New information economy</b>
energetically intensive	industrially intensive
standardized	adjusted to the scale
stable product	rapid changes in product
fixed plant and equipment	flexible production systems
automatization	sistemization
individual company	virtual network organization
hierarchical management structure	cooperative management
segmentation into work unit	integration
products are followed by services	servises are followed by products
power and knowledge centralization	power distribution/sharing knowledge
skills and knowledge specialization	skills and knowledge generalization
state ownership and control	state coordination i regulation

According to P. Drucker, characteristics of n.e. are classified into three groups:

- industrial production in terms of cost becomes independent of the raw materials and gets associated mainly with the services (continued decline in raw prices and increasing the share of the service costs in the price of the product since 1977),
- industrial production is realized and increases with continued reduction in the number of production workers which are directly employed (employment focus is shifted from material production to a service sphere), and
- the transformation of global economy from real do symbolic (the amount of capital substantially exceeds the value of total trade).

Competitive advantage depends primarily on the knowledge, skills and skills of employees. Therefore, the education system is one of the key assumptions in transition to n.e. It must respond to the changing and demanding needs of the ICT industry. A. Toffler in his book *The Third Wave* (1980) announces a new culture and civilization, founded on the information. The basic idea of his book is a possibility to divide the complex and contradictory human history according to certain patterns of behavior and characteristics of society. He devised it in a metaphorical waves, carrying a certain civilizational changes in the technological and social sense. The first wave started when the man left nomadic way of life and began to engage in agriculture. The second wave started with the industrial revolution in the 18th century. The third wave marks the transition to the information society (knowledge era). In his book, “*New Rules for the New Economy ...*” K. Kelly (1998) cited three basic features of n.e.:

- global character of the changes,
- operating the intangible resources: ideas and information, and
- overlapping and mutual influence of individual n.e. segments.

According to Hawken (1983), the mass economy has been characterized by industrial age since 1880. The term “mass” has emerged as an economic category, meaning the economy which paradigm was based of two dominant categories: *in production*, on the economies of scale and mass exploitation of energy sources (oil, coal, gas, etc.) and *in consumption*, on the mass consumption of material goods and the accumulation of material wealth, capital (property, money, luxury goods, etc.).

The difference between *mass* and *information* in the economy is reflected in the implementation of the relationship that is built into the product (Hawken, *Ibid.*, p. 35). Mass economy still exists due to the mass consumption of material goods, which are indispensable for human survival. Information economy and the knowledge economy is built on other grounds. It becomes the dominant paradigm of the social growth, all over the world. In addition, the knowledge economy will not replace the mass economy, but will only absorb it to the extent which is necessary and sufficient, and include it in its own evolution. In the economy, there is no clear distinction dividing the *mass* from the *information*. That line is defined by the amount of information embedded in the product (*Ibid.*, p. 37). The products of information economy use intelligent solutions (information and knowledge) and consume much less energy per unit of product.

TABLE 1.2: KNOWLEDGE ECONOMY AND MASSIVE ECONOMY

Knowledge Economy	Massive Economy
<p>New development paradigm of innovation and improvement, forecasting global demand, design, usability, functionality, durability (strength - endurance), <i>knowledge</i> - built into the product, new quality of the products, general education, environmental access to the sustainable growth.</p> <p><i>Long-term:</i> positive economic and non-economic achievements, health, ecology, mobility and sustainability of economic growth and so on.</p>	<p><i>Invasive, expansive strategy:</i> mass consumption, economy of scale, dirty technology, spending large amounts of energy, "welfare" society, the industrialization of agriculture and tourism.</p> <p><i>Long term:</i> negative economic and non-economic achievements, environmental pollution and volatile commodity markets.</p>

Source: adapted from Hawken, 1983, p. 39

M. Castells distinguishes five characteristics of n.e.:

- production increasingly depends on the use of scientific methods and quality of information and management,
- in developed countries, there is a shift of attention from manufacturers and users of material production to information,

- a profound transformation of productive organization (from standardized mass production to atomized and from vertically integrated organization na horizontal network of mutual relations between the parts),
- the global nature of the economy, where capital, production, management, market, labor, information and technology are organized across national borders, and
- revolutionary character of technological change based on IT.

The IT “shortens” time and space, creating more opportunities for rapid communication between distant businesses. Distance is no longer an obstacle to cooperation, because it enables new communication and direct contact between buyer and seller, simultaneously. Internet provides great opportunities for researching supply, demand and prices. It dramatically reduces transaction costs. Kelly writes that “*communication is no longer a sector of the economy, it is the very economy.*”

D. Tapskott (1999) points out that the new type of society is characterized by the following 12 features:

- orientation to knowledge,
- numerical form of expression,
- virtual nature,
- molecular structure,
- integration and network connectivity,
- eliminating and/or reducing agents,
- convergence,
- innovative nature,
- transformation of manufacturer-consumer relationship,
- great dynamics,
- global scale and
- the existence of contradictions.

## 2.6 Information as a Specific Resource

**I**nformation is giving meaning to data. Unlike data, information has meaning, purpose, and relevance. Information is data with context (Amidon, 1997). It has significance and meaning when someone uses the data for the intended

purpose. That meaning can be useful and have value to the recipient (not necessarily). Information moves through organization via existing communications networks. The result of converting data into information adds value and meaning to it. That will improve the quality of decision making. Information has unique features:

- it does not spend during its use, therefore it has multiple use (*“If you and I have one apple each and we exchange them, we will again have one apple each. But if you and I have one idea each and we exchange them we will have two ideas each.”*(B. Show),
- it is used in various forms and in various ways,
- production of it is much more expensive than the reproduction (copying), and in the market there are usually right to buy, not to copy the information,
- it exists independent of space, since both can be located and used in different places,
- it has one-way sale: it can not be recovered by repurchase,
- it can be sold more than once (with accordance to the law), and still be owned by the seller,
- its value decreases rapidly in time, because it becomes old and morally amortized, unlike material goods,
- it exceeds all boundaries and barriers easier than other resources, and afterwards appears as a conductor of the global processes,
- its realization passes through the network structure, having all the characteristics of network goods,
- it represents the social good (Martin, 195, p. 89) because *“everybody can own the same information at the same time, but the existence of information by one individual does not reduce the degree of its ownership for the other”*, and
- huge volume of information (congestion) makes the process of their search and the selection of significant information.

M. Hallgren (2000, pp 55-478) has given a similar interpretation of information as a social good. Of course, this leads to the problem of price formation, allocation, assessment, etc., inherent in all social goods. Information and knowledge are significantly *different* from traditional production resources, especially by its inexhaustibility, limitlessness and the lack of precise measurements of the creating costs of the so-called “information products.” For the purposes of our analysis, we will present some basic differences between information and knowledge (Inozemcev 2000, s. 4):

- Once produced information can become accessible to a wide range of users; adopting the information (receipt and delivery) they do not abridge it to other users; It is different with the knowledge that exists in objectified form, so it is available in only authentic form and only to its creator, and is not alienable; but when being submitted, it changes its original features.
- Information is circulation, it can be copied, and the production cost of each following copy decrease and tend to zero along with technical progress; creating the new knowledge requires all general information, greater effort and higher costs.
- Received information is available and democratic; the knowledge is rare and it is a result of ingenious creativity of individuals of high intellectual level.
- Information may be subject of ownership (*property*), while the knowledge appear as an object of governance (*possession*).
- Information has the characteristics of a public good (Poster, 1996, p. 73), while knowledge is treated as a personalized good (or *customized good* - Gay, 1996, p. 82).

Information minimizes uncertainty and risk. “*Information is a term that is directly opposed to the period of uncertainty,*” (K. Arrow). It provides a reliable planning, increases the quality of decisions and broadens the horizons of market choices (Clark 1985, p. 27). Unlike information, knowledge is a unique attribute, what we remember from the relation of thinking about a problem. It is a result of experience, confirmed by the theories, facts and insights. Information is data (annunciation) of a situation or structure changes or system function, necessary for the operation of any system, especially for the management system. It is a specific product, which has its own usefulness and the market price, linking economic decisions (preceded) with economic activity (action). Today, information has a strategic character. It is involved in the production factors (in addition to labor, capital, entrepreneurship and natural factors). Insufficient information means an entropy of choice, i.e. equal importance of all variants. Additional information reduces entropy, but its loss increases it. Information is available in various forms: documents, reports, analyses, and prognoses (technological, statistical, accounting, financial, operational, planning, etc.) As a factor of production, information is gaining importance, being an important condition for efficient production. It has long been regarded as an important economic resource (Compain 1988, s. 10), because it has as many properties as any other goods or services. In the market, it appears as a supply and demand information, having its own usefulness, price, cost, etc. Timely systematic, scientifically

based information is the basis of economic decision-making quality, because it increases the range of choices and contributes to the reduction of risks and uncertainties.

Information sphere comprises a wide range of different forms of production and application information: communication, education, print, advertising, cinema, television, scientific and technical research, business management, etc. F. Machlup (1962, p. 28) divided all areas related to the production of knowledge into five groups: education, science, means of mass communication and relations, information technology and information services. He has studied different meanings of the term information and found that there are at least 11 requests that are inherent in its various definitions. According to some of these requests, the information should:

- tell something that was previously unknown to the recipient,
- affect the amount and structure of the recipient's knowledge,
- be used in recipient's decision making,
- produce thoughtful, considered, or actually taken action by recipients,
- reduce the uncertainty of the recipient,
- exclude some of the alternative matters of things, and
- change beliefs of the recipient.

Many authors have tried to analyse the issue of identifying information, defining it as data that is processed and organized for a purpose. But process of transforming information exists only if a person understands. Replacing data with information Davis (1993, p. 201) explains as the similarity of relationship between the raw material and finished product. The term information is emerging as a fundamental concept not only in innovation processes, but in theory, such as communications, economics, cybernetics, library and others. However, despite the very frequent use of the term, and its fundamental position in many disciplines, there is a lack of unified theory able to explain the information in a unique and universally accepted way. Multiple meaning of the term information is a result of a multiple theory information:

- probabilistic-statistical (R. Fisher, R. Hartley, C. Shannon, W. Weaver, and others),
- non-statistical-mathematical: pathologic (N. Rashevsky) algorithmic (A. N. Kolmogorov and others),
- semantic (R. Carnap, Bar Hillel J., J. Kemeny, R. Wells, J. Hintikaka) and others.

This multiple meaning is contributed by sidedness, exclusivity and restrictiveness in determining the meaning of the term information. Useful and acceptable definition of information was given by R. Daft (1991, p. 200): "*Information is a data, processed into a form that is important to the recipient and is of real or observable value in the current or prospective actions or decisions.*" Information is essentially different from knowledge. Many scholars still believe that the knowledge as relatively true and accepted by the strict and impartial assessment of the value and relevance of the testimony. Basic characteristics of knowledge are: structure, coherence and relative permanence, unlike the information, which features partiality, fragmentation, temporality and extreme brevity. Quality factors of information are: relevance, correctness, accuracy, precision, completeness, timeliness, usefulness, accessibility, consistency, and confirmation of expectations. These factors must justify the cost of information. The quality of decision depends on the quality of information.

Market information is increasing. It updates daily, so the competition is pretty strong. The price of information determines its uniqueness, attractiveness, usability, relevance, availability, authenticity, completeness, form submission, and the like. Information possess many properties as any other goods or services, a wider selection of market participants and help to reduce their uncertainty. Market economy is characterized by a high degree of uncertainty, even though the principle of rationality is the basis of market theory and market participants behavior. Due to the market uncertainties and risks, expectations of the market participants can often be unrealistic. The quality of the decision depends on the amount of information available. In a market, where information is difficult to obtain, there are agents who collect and sell market information. In the recent years, the importance of the information sector has increased in all countries, regardless of development level. Market information services are developing dynamically, following the growing need for information and the rapid development of information technology, which has enabled remarkable progress of the information exchange.

According to a different criteria, information can be sorted in social, scientific, technical and managing, cognitive and entertaining, and so on. Information may have a short life cycle, but its use brings great benefits (operational control information, weather forecast, etc.). The influence of information on people and society is steadily increasing. Delayed application of modern information causes delays in development in the broadest sense of the word. The market information is often monopolized, which is enabled by a high concentration of production, capital and knowledge. For example, 20 years ago (1992) the largest telecommunication company in the world, American "AT&T" had 320,000 employees,

\$65 billions profit, and it controlled 99% of the total number of international telephone calls (*Delovije ljudi*, journal No. 12/1993). The market is flooded with new contents (products and services), which increase the quantity and value of supply and demand. Thus, for example, the value of information services in 1986 was more than a trillion U.S. dollars, while in 1990 was doubled, although in the meantime the cost of many goods and services, information dropped (*Vestnik of Moscow University*, No. 1/1995, p. 59). These data proved the rapid growth of IT market, where competition is extremely severe (especially in the film industry, television, video and computer production). There is a significant progress in information technologies of various new surface material of the same product information. Good example is the computer information, contained in different types of floppy disks and compact disks. In the information market price is determined by many factors, among which the most important are uniqueness, importance, attractiveness, availability, usability, integrity, originality, form and manner of delivery, the length of the life cycle and so on.

### 3. OLD AND NEW ECONOMY

**I**T leads to rapid and radical changes. They change human relationships in time, space, economy and society. With computer and communication technologies (Internet, etc.) establishment of networks and virtual elements is enabled. That way, information as a non-material factor gains a significant and often a leading role in the production. N.e. conditions the new communications and convergence, which leads to connecting the world and its unification in many areas.

Globalization has generated all the major changes in one strong paradox: people are getting closer in space and time, but they are estranged due to the growing economic and social inequalities. The rise of the information economy is marked by the development of a new organizational logic, associated with a current process of technological change. Interaction between the new technological paradigms and new organizational logic is not a historic backbone of n.e. The dominant knowledge economy feature is the use of information resources, which are significantly different from the traditional ones.

TABLE 1.3: THE DIFFERENCE BETWEEN “OLD” AND “NEW” ECONOMY

ENVIRONMENT		
<p><b>Market dynamics</b>  <i>Level of competition</i>                      Sources of competitive advantage                      Key drivers of growth                      Key technology trends</p>	<p><b>Old economy</b>  <i>Low</i>                      National competition                      Low cost                      Focus differentiation,                      Cheap labor and capital (production factors)                      Mechanization and automation</p>	<p><b>New Economy</b>  <i>High</i>                      Global competition                      Innovation, quality and speed of delivering “total service”                      Knowledge, ideas, innovation, technology infrastructure                      Digital communication and virtualization</p>
COMPANY		
<p>Dominant form of organization                      Organization of production                      Importance of research and knowledge management                      Relationships with other firms</p>	<p>Hierarchical, Bureaucratic                      Mass production                      Low to medium Competition</p>	<p>Entrepreneurship                      Networking                      Flexible production                      Adjusted to the specific requirements of customers                      One of the key sources of competitive ability                      Cooperation through the strategic partnerships</p>

Creating the knowledge economy must precede a national security of the social freedom, good educational system, quality institutional environment, guaranteed rules of running the business, and a reasonable balance between state control and market freedom. The absence of these conditions shows only a simple slogan. These conditions can serve as a good criteria for valuating the real development possibilities of knowledge economy. The economy is characterized by steady share growth of the scientific research in the national cost and private companies, as well as steady capitalization growth of the scientific companies. The research can prove a steady value growth of intellectual capital (registered patents, methods and organizational structure, etc.).

TABLE 1.4: DIFFERENCES BETWEEN THE INDUSTRIAL ECONOMY  
AND THE KNOWLEDGE ECONOMY

Category	Industrial economy	Knowledge economy
<b>Market</b>		
changes	slow	rapid
life cycle of goods and technology	long	short
main driving force of the economy	large industrial companies	entrepreneurial innovation companies based on the knowledge
competition character	local	Global
competition actions	large swallows the small	rapid swallows the slow
<b>Companies</b>		
basis	stability	managing the changes
success indicator	profit	market capitalization
orientation of the production organization	massivity	flexibility and small-series
key growth factor	capital	knowledge, innovation, integration, the creation of new companies, joint investments
key factor of technology development	automatization and mehanization	information and communication technology, electronic business, design and manufacturing computerization
main source of competitive advantage	access to raw materials, cheap labor and working capital, reducing costs through economies of scale	institutional benefits, labor resources, value control, quality management with respect to customer demands, market research
missing resources	financing capital	human capital
decision-making process	vertically	by distribution
innovation processes	periodic, in-line	continuous, systematic
orientation of the production	internal processes	complete value chain
strategic alliances	rare, dominance of the view that acts independently	wide, accessing the additional resources

organizational structure	hierarchical, bureaucratic, pyramidal	interrelated subsystems with delegated authority, the network structure
<b>Management</b>		
managing	vertical	leadership of workers
habits	one-sphered, standardized	multi-sphered, flexible
requirements for education	qualifications, scientific degree	constant learning
relations managers to subordinates	confrontation	cooperation, teamwork
employment	steadily	depending on conjunctures
treatment of workers	cost	investment

To understand the changes in the business environment and training for the new operational models and concepts, we must compare the most basic elements of the new economic realities with corresponding ones in the old economy (Tables 1.3 and 1.4). Identifying the new ideas and categories, contained in the n.e., we can see the differences related to the classical economics. The common thread of these differences is the increasing role of knowledge, information and technology. To understand the difference, between “new” and “old” economy, we must go back to the very beginning, or to the economy offspring (simplification) - transaction. Today, in a complex economy, transactions require different activities that generate costs. Transaction costs depend on:

- the legal system (a system of property rights, the application of property rights, the ability to predict judicial decisions), and
- the political, educational, social and cultural systems. This means that the economic system can not be explained only by the economy. It takes knowledge and other (legal, social, political, psychological, technical, technological, institutional) knowledge to understand the real functioning of economic system.

The level of transaction costs is also influenced by IT. The largest component of transaction costs is the cost of obtaining information. Knowing that IT, in fact, reduces the cost of obtaining information, it reduces the transaction costs. As a result of technological change, IT made significant changes in the economy through the reduction of transaction costs. This topic was analysed by H. Varian (1999, p. 42): “*The new economic concepts have never emerged parallelly with*

*the new economic phenomena. There was a lot of discussion about the growing restitution, the effects of networking, the input costs, etc.. These are hardly the new concepts, these as just been parts of the economic literature for decades. These are very important ideas, but not a great ideas. They explain certain phenomena, but their range is limited. I think the great ideas (when it comes to economic literature) can be found only if we go back and study the work of 'The nature of the firm' (1937)".*

R. Coase (1997, p. 4) disagreed. He found it interesting that this study has become part of the Internet literature. "*Transaction costs are reduced: what are the effects?*" he asked. According to Varian, representatives of n.e. found this idea (category of transaction costs – author's note) very attractive. One of the Internet's advantage is the cheaper communication. This, in turn, reduces transaction costs and changes the company limits. The company would move and reduce the functions that are not necessary and would be carried out more transactions using Internet, rather than sending internal memos. Varian reviewed this observation. He said, "*even though Internet reduces the cost of transactions between companies, it also reduces the cost of communication within the company and thus facilitates organizing and functioning of large companies.*" According to Coase, this was not the end of analysis. Reducing the transaction costs allows the companies to reduce the cost of their essential activities, which can lead to a greater activity, higher production and expending the companies. The essence of the firm and understanding of the market is significantly altered in the n.e. In the era of knowledge economy, economic policy must be based on the following fundamental principles:

- developing the science and technology as the propulsive factor of economic growth,
- creating a favorable investment climate and stimulating the investments in high-tech production,
- creating a flexible institutional environment in all economic segments (institutional pluralism), particularly in the area of national regulation, which must be able to react to market failure, especially in science and education,
- supporting the conditions of competitiveness in part of stimulating innovation and labor productivity,
- training of the working resources for managing the changes, risks and crisis, and
- implementing the stimulative economic, legal, and organizational solutions.

There are two context of the knowledge economy. The first is scientific, which analyze empirical hypothesis, ie. generalization of the trends and characteristics of modern society (knowledge, information, etc.). The second is political, where economy knowledge is viewed as a program goal and a vision of the future. Those contexts are in some way connected to each other through the daily practice through phenomenological elaboration in the literature. However, they seem to operate according to different rules: in the scientific context they function as a hypothesis, and in the political as a statement. For example, scientifically, the knowledge economy is generally interpreted for its growing role of knowledge and information, and politically, focus is on the production and use of information and communication technologies, in the spirit of technological determinism.

The effects of the knowledge economy are amazing. The good example is a case of Russian programmer A. Pajitnov, who earned \$15,000 for creating the popular computer game "Tetris". The Computing Centre of the Russian Academy of Sciences earned four million dollars from it. The transnational corporation "Nintendo" which bought the patent, earned more than one billion dollars. Today, Pajitnov works for "Microsoft", whose main funds are worth 10 billion dollars and the market value of the company is 350-400 billion dollars, with the annual profit of 70 billion dollars. The production of knowledge in the world is very localized. Its consumption is widely and uniformly globalized. Another paradox related to the knowledge economy is this: knowledge is virtually unlimited resources, but the expertly human resource is extremely rare (limited), absolutely and relatively.

### 3.1 Information Asimmetry

All previous analyses show that the actual economic life requires development of the theory that will explain the new economic phenomena. In n.e. theory, the effect of innovation replaces maximization paradigm. Flexibility and learning replace the assumption of rational agent, able to identify the optimal strategy in any situation, without any learning process. Neoclassical economics is silent when it comes to the costs of acquiring the knowledge, required to achieve the optimal choice (alternative choices of the agents) and the effects of new knowledge about the prevailing rules (Pejovich 1998, p. 6). A. Schotter (2003, p. 675) has correctly observed: "*The only institutions that exist (in*

*the neoclassical model – author’s note) are the competitive markets in which all economic information must be transferred through prices, formed in these markets. So, the economy has assumed that there are no social institutions created by the society for better coordination of its economic and social activities through offering information that is not available in competitive prices.”*

Is the neoclassical model approved by the real world? To what extent is it abstract? The main question is: Is the information perfect? The answer is no. Imperfect information prevail in the economy. According to J. Stiglitz (2000, p. 56), it is hard to imagine how the world would look like with perfect information. Obviously, different people know different things: workers know more about their skills than the company, people who buy insurance know more about their health (eg, if they smoke or drink excessively) than the insurance company. The car owner knows more about it than a potential buyer. The company owner knows more about the company than a potential investor. The one that borrows the money knows more about the risk than the one that gives the money.

The main feature of a decentralized market economy is that different people know different things. In this regard, J. Stiglitz (Ibid.) states: *“Economists have long researched the markets with information asymmetries. Its creation and consequences were not analyzed in the early studies. While the scholars stayed focused on the simple situation of information symmetry, the problem of the information imperfection was deepening.”* One can know a little about his health. Insurance company, through a simple search, may be better informed (at least in terms of the relevant aspects, ie. the implications concerning certain expectations). Some of these information asymmetries are inherent: someone certainly knows more about himself than anyone else. Some asymmetries naturally flow from economic processes. Actual employer knows more about the employee than other potential employers. The company can get a lot of information through business. The owner of the car knows weaknesses of his vehicle better than anyone else. These information asymmetries are inevitable, but their effects and scope depend on the methods of structuring the market and understanding the influences on market behavior. An important analysis in this area explains how the information asymmetry leads to a weak market, or even to its dysfunction (Akerlof, 1970).

### 3.2 Transaction Costs and Information

The theory of property rights is separate from neoclassical economics. The exchange and production are the main methods through which people seek to solve the problems that arise in rarities. The tendency for the exchange involves two levels of social activity. The first includes development, modification and specification of institutions. The second is an exchange within the prevailing social arrangements. The first presents the rules of the game, the second is the game itself. The rules of the game are expensive to create and implement. They require transaction costs, which represent all the resources necessary to carry out the exchange (eg. detection, possibility of exchange, negotiation, monitoring and implementation). Also, development, maintenance and protection of institutional structures (such as judiciary, police and armed forces). R. Coase, D. North, S. Pejovich and others underline the importance of transaction costs for the better understanding of the social and economic processes. J. Stiglitz and others discuss the importance of information for understanding the economy. The reason for mistakes is that the system theoretically did not take into account the factor that is essential for economic development, and these are the rules (laws) and a new important resource - information, knowledge, creativity and innovation.

Neoclassical economics is a product of the rationalism era, with its conventional wisdom that the nature has endowed individuals with the ability to identify and to apply rational solutions to existing problems. It sums up the desire for profit, as the main feature of human behavior, generated in the paradigm of maximizing and analyzing the economic results of this behavior in the world of unchallenged dominance of private property and insignificant transaction and information costs. Adjusting the assumptions and limitations, faced by an individual decision maker, neoclassical economics has been able to identify a number of abstract equilibriums. They all represent the idealized statements about how the world would look like without uncertainty and incomplete knowledge. Information is not a free goods. In a world of uncertainty, incomplete and asymmetric information, we need some real resources (including time and money) for collecting, processing and storing the information. Of course, the cost of research can prevent detecting the best alternatives. Customers know that looking around enables the best purchase, but it may not be the most effective solution, taking into account the cost of fuel and time dimension. However, if the price of additional information is reduced, the additional options of exchange would be used and the volume of trade would be increased. This raises an important

question in a new light: the influence of IT on the reduction of transaction costs. In the economy of private ownership and entrepreneurial freedom, resources are used to create and sell information. The cost of negotiation can be substantial. The parties may not know each other. They may not have all the relevant information on goods and services. Goods and services have many attributes that are expensive to establish. The consequences of determining all the attributes would be reduction in the volume of trade. A performance creates cost sharing. D. North and J. Wallis made the first measurement of transaction costs. According to them, the profit from trade is the result of specialization and work distribution. It is implemented through the exchange, which is not free of cost. The transaction costs are limiting factor in economic development. The incentives for effective improvement in the transactional sector are important as well as in the production sector. The question is which institutions (Cost here implies a certain hierarchical procedure) provide incentives for innovation in the transactional sector of the economy. North and Wallis came to the conclusion that transaction costs increase significantly during the research period: from 26.09% in 1870 to 54.71% in 1970 (Pejovich, *Ibid.*, p. 34). They offer three explanations for the expansion regime of resources used in the transactional sector in the growing economy: more exchange in the absence of partners, so impersonal exchange requires collecting more information and follow-up mechanisms for its implementation, production technologies increase incentives in the companies for further growth. It is essential to develop more resources for transactional services within the company.

### 3.3 Information Technology and Economic Performance

Past several years characterized a substantial increase in analyzing the relationship between information, knowledge and economic performance. This was a fundamental transition because direct production of goods and services no longer absorbs the benefits of workers' time. In 1975, the production of goods and services ceased to be the focus of the working class in the United States. Until then, the society has never been so productive, so that the majority of workers had jobs in the sphere of management, sales, office and creative engagement. In 1900, the production of goods and services was performed by 82% of the U.S. workforce. That number has dropped significantly to 64% in 1950 and to 41% in 1999. Managers, professionals and technical personnel,

involved in creative activities, increased participation in the workforce from 10% in 1900 to 17% in 1950, and to 33% in 1999 (Nakamura, 2000, p. 16).

Perfect competition is a central category on which economists rely on when describing a western economy. It is the foundation of A. Smith's theory "Invisible hand", focused on the production processes and parts of information tasks, performed by managers, professionals, officers and workers in sales. The idea of perfect competition was formulated by W. Jevons, L. Walras and C. Menger in the XIX century, when direct production of goods and services was a dominant business. Does it still operate nowadays, when innovation is so important for economic activity? Millions of workers perform creative jobs such as design, innovation and marketing of new products. More economic activities are opened to technical and procedural progress. A. Smith's theory does not explain why the economy changes. The theory by J. Schumpeter, often cited as a creative destruction, is much better idea to explain the n.e.

### 3.4 Analysis of the Differences Between the Old and New Economy

**B**elow are some key points to the differences between "old" and classical, modern economy through analyzing the relationship between local and global, change and continuity of the change, turbulence and stability, specialization and diversity, heterogeneity and homogeneity, motivation and control, market exchange and transaction, competition and cooperation (as complement and substitute), flexibility and economy of scale, stimulation and regulation, target inputs and target outputs.

**Localization vs. globalization.** Economists attach different importance of geographic space in the old and new economy. Standardization of products and production in the old economy reduces the importance of specific regional characteristics. As presented by neoclassical production function, the old economy production is the result of inputs: land, labor and capital (Romer 1992). While these traditional inputs are playing a role in the n.e., the knowledge emerged as the most important factor of production. The recent texts point out that knowledge is fundamentally different from the traditional factors of production. It can not be transferred without cost through geographic space (Krugman 1991; Lucas 1993). That is why geography plays an important role in the n.e. Because

the knowledge is developing in the context of local networks, known as innovation clusters. Empirical data clearly show that research and development (R&D) and other sources of knowledge not only create externalities; also, spreading of such knowledge tends to be geographically link within a region, where the new economic knowledge has been generated (Audretsch and Feldman 1996; Audretsch and Stephan, 1996, Jaffe et al., 1993; Jaffe, 1989). The new economic knowledge can be spread, but it is geographically limited. In fact, the geographical dimension of knowledge remain a local phenomenon, in most cases unaffected by globalization, which allowed free transmission of specific information through geographic space. In the old economy, the traditional factors of production (land, labor and capital) have been the predominant source of competitive advantage, while in the n.e. comparative advantage is based on innovative activities. An important source of innovative activity is the awareness of the knowledge spillover, which can not easily spread through the geographic space.

**Change vs. continuity.** There is an inherent difference between change and continuity. The old economy depends on continuity (Chandler, 1977), the n.e. provokes changes and is based on them. Innovation is present with the changes and continuity. The difference determines a distinction between radical and incremental innovation. Innovations can be considered as incremental when compatible with the general competence and technological trajectory of the company (Teece et al., 1994). Implementation of incremental innovation does not require significant changes in the company. In contrast, radical innovation can be defined as an expansion beyond the limits of competence and technological trajectory of the company. Theoretical studies and empirical data support the thesis that the company is characterized by technological closure. The old economy is shaped so it can absorb the changes within a given technological paradigm. Therefore, the typical company is characterized by incremental innovation. Conversely, the capacity of the n.e. is strengthened to it overcomes the technological closure within the existing paradigm.

**Turbulence vs. stability.** The old economy was characterized by a remarkable stability in terms of homogeneity and durability of the product demand, resulting the constant immobility of the workers. This stability is useful for mass production. Taylorism actually provided marginal mechanism for ensuring the stability and reliability of workers in the production process, since the competition was focused on prices and not necessarily on product differentiation (Chlander, 1977). The n.e. is characterized by high turbulence. It is constantly moving, increasing the number of new companies.

**Variety vs. specialization.** A specialization is a precondition to the neo-classical economics. Diversity has been recommended in the n.e. Recent studies have provided evidence by testing the influence of diversity versus specialization on the regional performance, as measured in terms of development and innovative activity (Feldman and Audretsch, 1999). These studies provide systematic empirical proof that diversity is better for spreading the knowledge and innovation activity than specialization.

**Heterogeneity vs. homogeneity.** There are two dimensions that shape the degree of homogeneity/heterogeneity. The first dimension refers to the genetic characteristics of individuals and their personal experience (Nooteboom, 1999). The second dimension refers to the information. The old economy is based on homogeneity and the n.e. is based on heterogeneity. The world of homogenous economy promotes diffusion, rather than innovation. In the heterogeneous population, each individual has a unique set of information (Olson, 1982). New ideas will likely arise from communication in a heterogeneous, not homogeneous world.

**Motivation vs. controls.** In the industrial era, the work was considered to be unnoticeable in comparison to other inputs. That is why the work input in the production process was reduced to a routine (Chandler, 1990). However, given that the comparative advantage of industrialized countries is based on the new knowledge, access of command and control of the work becomes less effective. It is important to motivate employees to facilitate the discovery and implementation of new ideas. The main feature of today's life and work is dealing with uncertainty, and workers who are ready to handle it are "more valuable" in the n.e. It motivates them to participate in creating and commercializing the new ideas, not only in controlling and regulating its behavior.

**Market exchange vs. company transactions.** In the era of great uncertainty and imperfect information, market exchange is more limited than in the intra-corporate transactions in relation to the market exchange. In the old economy, dominated by a high degree of certainty and information predictability, transactions within the company were more efficient than market exchange. This was elaborated in the works of R. Coasea (1937) and O. Williamson (1975), underlining an analytical distinction between exchange markets and transactions within company. Company size is defined by the response to the Coasea's (1937, p. 30) question: "*How much are the transaction within the company?*" Coase and Williamson proved that uncertainty and imperfect information increase the cost of transactions in the company.

**Competition and cooperation as a complement vs. competition and cooperation as substitutes.** Models of competition assume that companies behave autonomously and models of cooperation include links between companies. This requires various forms, like joint ventures, strategic alliances, formal and informal networks (Gomes-Casseres, 1996, 1997). In the old economy, competition and cooperation are seen as substitutes, because the companies were vertical integrated and competed primarily in the product markets. Cooperation between companies decreases the number of competitors and the degree mitigate your competition. In the n.e. companies are vertically independent and specialized for the product market. Greater degree of vertical disintegration in the new economy means that collaboration among independent firms changes the internal transactions within a large vertically integrated cooperation. At the same time, there is a greater number of companies, resulting in increased competitiveness and cooperative interface. The likelihood that the company will compete and/or cooperate with another company is higher in the n.e. A new and improved formula leads independent companies together on the new and unexpected paths.

**Flexibility vs volume.** The classic way to reduce the cost per unit of production in the old economy was through expanding the production volume. Large companies had more advantages. This led to concentrated industrial structure (Chandler, 1977). In the n.e., the alternate source to reduce the average cost is flexibility. Teece (1993, p. 218) stated that “... *flexible specialization... and contracting can lead to greater advantage than economy of scale. Industries, in which demand for certain products is constantly changing, require flexible production system that can meet the changing demand. There are four main sources of flexibility: technology, organization, demand and quality. They result in reducing the importance of economy of scale.* “

**Stimulation vs. regulation.** Public policies emerged after World War II, in the era of old economy, dealing with the company in the market, were limited in nature. There were three types of public policies in the business - antitrust (competition policy), regulation, and public ownership. All of these three policy approaches restricted freedom of the company contracting affairs. Although specific approaches were generally more associated with one country, more than with others, such as the U.S. antitrust or public property in France and Sweden, most countries had a common approach to intervention, in order to limit the market power of large companies. Public policies limiting the company freedom has been consistent with what was being created in the theory and empirical evidence. If not controlled, large corporation, which possess market power, will allocate the resources in a way that reduces social welfare. Through

national intervention, the efficiency and the fairness ratio would resolve in a socially satisfactory way. J. K. Galbraith (1956) commented the role of government in the old economy, where national intervention involved social partnership of big business, government and labor unions. This social partnership existed in almost every western economy. The relevant political issue in the n.e. is no longer: "How the government may restrict the company from abusing the market power?", but rather: "*How the government may create an atmosphere that will lead to the success and vitality of the company?*" The main issue of the n.e. has converted from the problem of excess income and abuse of market dominance to international competition, development and employment. It protects the corporations not because of their considerable success and power, but because they are not sufficiently successful. Jorde and Teece (1991) advocated the need to loosen the antitrust laws, allowing U.S. companies to collaborate and compete in as efficient manner as possible in relation to Japan and European companies.

**Target inputs vs target outputs.** Due to the relative certainty in terms of the markets and products in a controlled economy, the appropriate policy response is targeted result and output. Specific industries and certain companies can promote themselves through government programs. Specific target companies in selected industries had represented a successful Japanese politics in the postwar period, which helped it to achieve a competitive advantage in industries such as automobiles and electronic. J. Stiglitz (1996, p. 151) in "*Some lessons from the East Asian miracles*" said that "the national interventions act coordinated." They have contributed, at least in part, the postwar Japanese development miracle. The success of Japanese industrial policy in promoting the performance criteria, which expanded trade performances to economic development, documented in a series of empirical studies (Pugel, 1984; Audretsch, 1989; Noland, 1993; Okuno-Fujiwara, 1991).

**Local vs. national policy.** An important aspect of the difference between the old and n.e. is a political location. In the old economy, the appropriate place for policy-making was at the national or federal level. While targeted recipients of the policy can be localized in one or more regions, the most important political institutions are at the national level. In the n.e., a place of national policy towards business tends to be decentralized and regional.

**High-risk capital vs. low-risk capital.** According to the n.e. traditional funding sources are no longer appropriate. The capital investment in partly risky projects is very important. It is a form of financing of high-risky new forms and informal capital market (Gaston, 1989; Gompers, 1999).

## 4. THE NETWORK ECONOMY

**A** stronger competition is the inevitability of modern economy. It imposes increased demands on companies for fast adaptation and large changes. In the last 15 years, the battle for market is on again, among others, by method of enlarging (mergers and acquisitions). It is the fifth wave of so-called *strategic takeovers* (from 1993 till today). So far, there were monopolies (1897-1904), oligopolies (1916-1929), conglomerates (1966-1974) and non-friendly takeovers (1981-1989). Merger and acquisition (MA) boom peaked in 2000. That wave is already significantly declining and ending. This raises the question: Is there a sixth wave of *virtual connecting* through business networking, which is the essence of network economy?

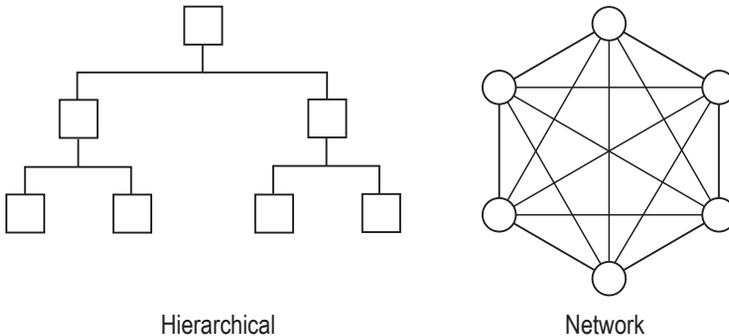
Innovations, increasing level of knowledge and skills, modernization, continuous monitoring of market demands, *know-how* and maximum informativeness were imperative of modern times. But this was not enough for gaining a decisive competitive advantage. The traditional hierarchical-bureaucratic forms of organization and management, with appropriate functional elements of organizational culture, have become a serious obstacle to strategic dynamization of modern companies and organizations. It's a natural aspiration of every business to reduce its costs and realize greater synergic effects. It turned out that, apart from taking strategies, the key knowledge, skills and other advantages valorized in the market as competitive, can be achieved even through networking. Modern business has already established the network economy in strategic, organizational and managerial terms.

The network economy is closely linked to globalization, alternative employment and development of autonomous working forms. It is especially characteristic for global enterprises in the service area. It enabled the boom of information and communication technologies, which have contributed to the market transparency, reducing the information searching costs, deregulating and dominating the customers market. In practice, when multiplied and multivariate communication flows at a distance are enabled, the goal of communication technologies and network systems is realized quickly. Remains only its application and practice training, provided by innovative business. The network economy was conducted simultaneously on two fronts, and in two ways:

- internal (intra-corporate, conducting market mechanisms within the company, developing the entrepreneurial spirit and combining the control methods) and

- external (expanding the cooperative networks with sub-suppliers, customers, similar enterprises and even competitors).

FIGURE 1.2: HIERARCHICAL ORGANIZATION AND NETWORK CONNECTIVITY



The practice has proved that networking of organizational structure, business processes, scientific research and so on, produce a key knowledge, skills, and other benefits, valorized on the market as competitive. The networked partners in business processes increasingly use their *key competencies* for faster, cheaper, more flexible, better quality and greater results, creating a competitive advantage in the global market. The network economy is defined in various ways. Its main goal is to achieve beneficial economic and organizational effects (direct and indirect). It can be explained by its basic principles and functional specifics, consisting in tendency of organizational development and training in order to achieve the greatest success in the market. Essentially, it is a self-managed polycentric economic structure, which is target oriented to specific tasks, and is based on the following principles:

- elitist connecting the competent business partners (Rajss, 1997, p. 94),
- business and partnership anti-bureaucracy and anti-formalism,
- decentralization of authority and responsibility (“*democratic hierarchy*”),
- highly sophisticated communication-informational integration,
- branch character of connection,
- free connecting based on equality and independence, in certain time and on a consensus basis,

- coordination of mutual cooperation, based on clear rules, ambitious goals, and advanced system of controlling,
- vertical and horizontal communication,
- applicability in the dependence of the new problem situation,
- dynamisation of business and organizational strategy by introducing so-called “*internal market*” institutions (of compensatory character), expert knowledge, innovative combination of managing and organizational models, motivating entrepreneurial initiatives, etc.,
- hybrid and non-traditional organizational structures, and
- “unlimited” expansion, ie. deletion of organizational and business boundaries between the companies merged in any way.

On these principles are created new forms of alliances, strategic networks and virtual enterprises, consisted of multiple organizational units with a unique goal to provide a synergistic contribution and increasing the quality of mutual organizational communication and cooperation. From an economic and organizational perspective, the main goal of network economy is to achieve beneficial effects (results). V. Rolf (2003, p. 84) has distinguished the direct and indirect network effects. He believed that direct network effect was characterized by a situation where benefits of the goods directly increased due to the greater use by many people (eg, phone, fax, internet, etc.). The phone itself does not bring any benefit to its user, if he can not communicate with other people, but expanding the circle of users increases the overall benefit for each user.

B. Metcalf has expressed this in equation:  $VM=K^2 - K$ , connecting the lawful value dependence of network amount VM and its users K (Ibid.). For example, if VM for the one network user is €1, applying this network value formula for 10 users is 90€, and for 100 users is €9,900. Also, there are questions of the adaptation period, the adaptation of losses and minimal number of network users. Indirect effects are characterized by daily market situation, where completed products or services (spare parts, service, programs, etc.) become cheaper and more accessible. These effects are achieved when the growth of demands for certain goods increases interchangeability of spare parts, improving service and forming the market standards that stimulate mass production, contribute increasing the quality and reducing the cost of production (Ibid.).

The network economy is a new entrepreneurial organizational process model, which has been developing through the basic elements (information, innovation, communication, new technology, etc.). It significantly changes the performance of international trade and competition in general. The network economy is not a substitute for the traditional hierarchical-bureaucratic orga-

nizational and management structures, but as a new management strategy, and even *paradigm*, used by many of the world (especially global) companies, basing their success on the development and structuring of modern business processes. Networking improves the ability of adapting to changes, innovation, modernization and training in relation to the hierarchical-bureaucratic organizational structure. In addition, the network strategic management enables organizations to reduce costs, increase profits and better respond to changing market conjuncture (M. Draskovic, *Ibid.*, p. 169).

As the network economy is directly linked to information products, when it comes to its effects, we should take into account:

- creation of information products is associated with high fixed costs (original) and low marginal costs (copies),
- technological innovation continuously shorten the life cycle of information products and lead to the “erosion” of prices,
- time has become a strategic factor of success, because the first one who offers a genuine product on the market will have the greatest benefit from an initial high price and will be able to quickly amortize high investments, and
- innovations stimulate the phenomenon of so-called “deferred demand”, because potential buyers wait for the lower prices or new products, for example computers (M. Draskovic, *Ibid.*, s. 86).

In the economy of the industrial society dominated a law of diminishing marginal productivity with negative-feedback effect. According to the classical theory, this contributed to the stabilization and the balance of the productivity through rational use and allocation of resources. But in the economy oriented to information and network, dominate a direct network effects and positive feedback. This is reflected by the growing marginal productivity, as shown in Figure 3. This positive feedback connection has formed and intensified under the influence of four factors (the first two affect the demand, and the other two affect the offer):

- direct network effect on the factor income growth under the influence of the production volume growth,
- growing expectations that the network expansion would affect the consumer’s will to get involved and therefore increase the usefulness,
- dominance of fixed costs and low marginal cost, where manufacturer seeks maximum production volume to compensate high initial fixed costs, and

- training and accumulated experience increase the positive feedback effect (Rolf, *Ibid.*, s. 87).

TABLE 1.5: DIFFERENCE BETWEEN NETWORK AND HIERARCHICAL ORGANIZATIONAL STRUCTURE

<b>Structure Criterion</b>	<b>Hierarchical</b>	<b>Network</b>
connectiveness	vertical, organizational, imposed	horizontal, subsidiary, free
organization structure	uniform	polycentric
hierarchical dependence	large	insignificant
authority and responsibility	centralized	decentralized
nature of partnership	dependent, bureaucratic, formal	independent, antibureacratic, informal
computing	individually	synergistically
flexibility and expanding possibility	limited	unlimited
performance	unique, static	unique, dynamic
work division	large	small
communication	subordinary	multiplied and multivariable
status and position of workers	substitutability, dependence, obedience	information, engagement, loyalty, independence, motivation
beneficial effects	cooperative, individual	synergic
networking	insignificant	branching
partner's group	stable, legally regulated	unstable, agreed
workflow	insignificant	flexible, situate
organizational framework	permanent, homogenous	temporary, loose
influence, power	depends on hierarchical level	depends on knowledge and skills
cooperation possibilities	insignificant	extremely high
main goal	maximization of production volume, profit	profit optimization, quality, competitive advantage, inovation, image

Empirical studies have shown that nothing is ideal, especially in the network economy. For example, Rajss (1997) points out a three specific substitutes of traditional business forms. They appear to be a limiting factors for the success of the network economy. It is about the network culture, mutual dependence and climate of trust. The organizational culture is continuously limiting the growth of transaction costs. Network access insists on strict rules of the game, which, according to Rajss, are an integrator of identification and integration. Clearly, the network organizations, which often have a time-limited project, have no tradition and no time to develop their own organizational culture.

The principle of the mutual dependence, which in traditional organizational structures act as a stabilizer, is not a typical for the complex and temporary network constructions with many newly formed connections and relationships. Similarly, the confidence between the partners is only possible after a “long run”. Usually, it is not the case with a network economy, based on the synergistic linking partners. Often mentioned virtual enterprise is difficult to restrict from conceptual design and module organization. Therefore, it represents the organizational form that has no legal basis. The virtual enterprise is a group of companies, based on common goals and supplying the market of specific goods or services. In economic relations, they are correlated, informatively networked, legally linked, independent, usually without institutionalizing the functions of top management, and with mutually trusting partners. The term “virtual” is primarily related to the creation of timely deposited situational management competencies for fast response to the changes in the environment and the realization of the market goals. It usually involves the allocation of resources, knowledge management, and marketing.

The *idea of virtuality* is simple. It comes from a desire to reduce risk and relativize competition (by increasing the number of networked partners), to obtain competitive advantage and managerial competence. In practice, it manifests in several ways, including: a) creating a foreign branches and joint companies, where large firms delegate certain competences, based on the “encounter movement” of the partners as a form of evolutionary quasi-externalizing, in which the contracts regulate the terms of cooperation, rules of conduct, strategic leader, etc., b) reverse path from the previous one, in which small and medium enterprises offer their competence to the big companies with business image, know-how, information infrastructure, leadership, etc., and c) vertical and horizontal interconnecting the small and the medium-sized enterprises.

FIGURE 1.3: THE DIFFERENCE BETWEEN THE INDUSTRY AND NETWORK ECONOMICS

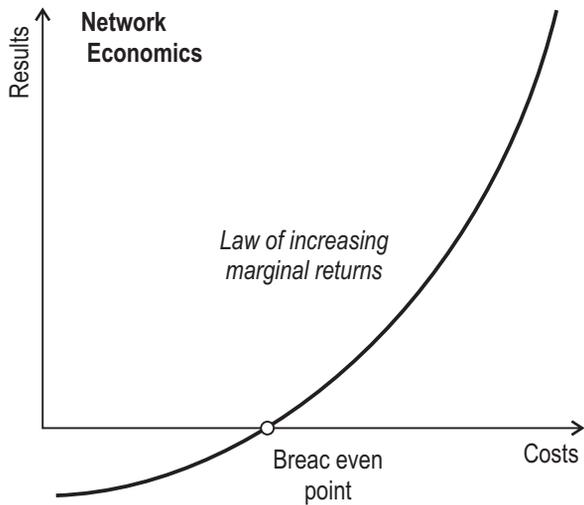
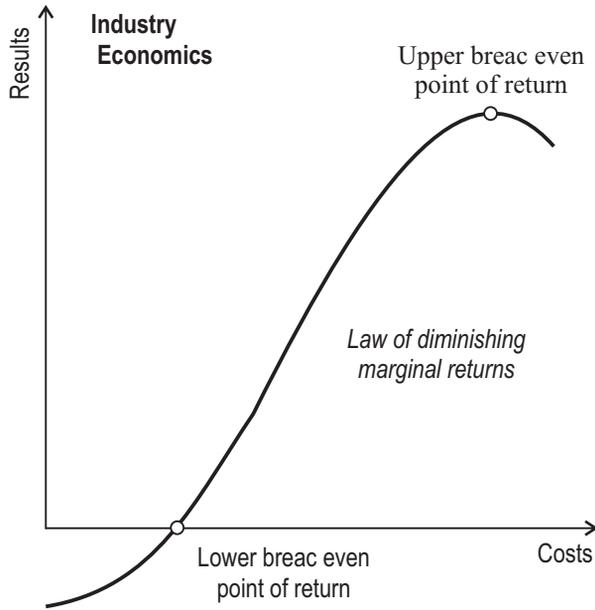
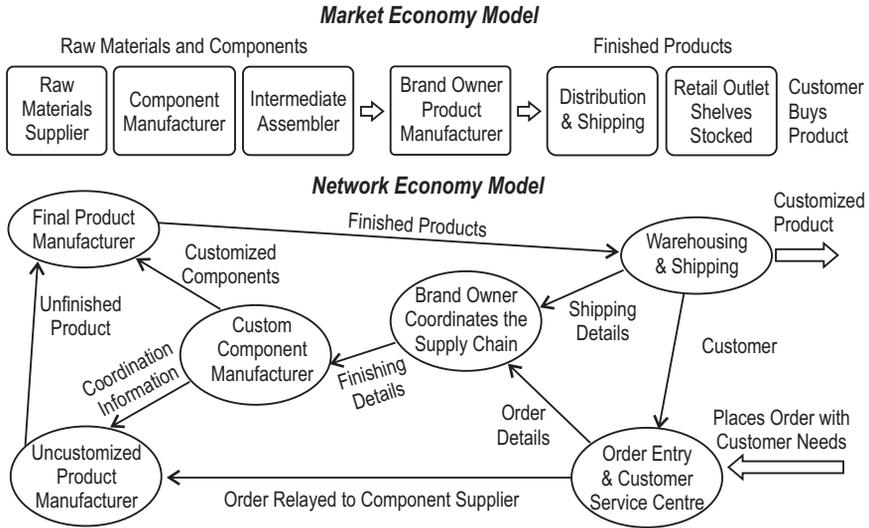


FIGURE 1.4: MARKET EKONOMY MODEL AND NETWORK EKONOMY MODEL



Source: *Creating Value in the Network Economy* by Don Tapscott.

After transiting from the industrial to the “service society”, the traditional hierarchical-bureaucratic organizational and management structure appears to be ineffective in terms of a satisfactory response to the demands and challenges of the faster and bigger changes in the environment and stronger competition. The network economy is not their substitute, but a new economic and management strategy, used by a number of the world (especially global) companies, basing their success and development on modern structuring of the business processes. This connecting process is strategically, functionally and fundamentally different from traditional corporate structures, as it, among others, includes the creation of a new shared values. The “networking” is a revolutionary transition to the new methods of knowledge and organization management. The knowledge and the information, the only unlimited productive resources, are the key factor in developing the network economy. Each new connection to the pool of knowledge multiplies the value of the whole.

The more modes exist in the network, the greater is benefit to each mode of a network. Result is a new rules of competition, a new kind of organization, a new challenges for the management. The new economy requires management decision-making under conditions of network infrastructure and information and communications convergence. Practice has shown that networking improves abilities to adapt to changes, innovation, modernization and training in relation to the hierarchical-bureaucratic organizational structure. In addition, strategic management of the network organizations enables reducing costs, increasing profits and better responding to the changes in the market conjuncture.

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#### **Box 4 - EXPLORING NETWORK ECONOMICS**

*“There is a central difference between the old and new economies: the old industrial economy was driven by economies of scale; the new information economy is driven by economics of network.”*  
C. Shapiro & H. R. Varian

##### *Introduction*

*A central task for investors is to understand what a business will look like in the future, and judge whether or not today’s stock price properly handicaps that outcome. For many companies the past is prologue; companies always strive to get bigger and better, but their fundamental activities don’t change much. These goods and services businesses generally have production-based roots and classic industrial economics effectively address their growth and business model characteristics.*

*In recent years, information technology and networks have merged to create companies with characteristics quite different from their production-based counterparts. These include unprecedented market shares, very high returns on invested capital, and rapid growth. As important, the market doesn’t always anticipate how the fundamentals of these companies unfold, leading to investable opportunities.*

*Networks—canals, railroads, and highways—have been around for a long time and played an important role in global economic development. However, our primary interest is not in physical networks but rather in networks that rely on information technology.*

*Economists have successfully described the economics of both information and networks. These economic principles appear durable. It is the combination of information and network properties that creates opportunities for businesses and investors. Most investors have not internalized these ideas.*

*We believe the importance of information-based networks is increasing in today’s global economy for four reasons:*

- Physical capital needs are lower than they were in the past. Information-based networks require less capital as they grow than physical networks do.*

- *Networks demonstrate increasing returns. Most industries benefit from supply-side increasing returns to scale: higher volume leads to lower unit costs, up to a point. In contrast, successful networks generate increasing returns from the demand-side as users beget users.*

- *Networks can form faster and more frequently than in the past. Because of plummeting communication and computing costs, the barriers to creating a network are declining. But even though the barriers to entry are low, the barriers to success remain high.*

- *Networks can spread globally. Because many networks have high upfront costs and low incremental costs, they can expand rapidly within countries and across borders.*

*This report focuses on how to categorize networks, how they affect economic value, and how they form.*

### *Networks and Economic Value*

*A company's ability to create shareholder value derives fundamentally from its ability to generate returns on invested capital in excess of the cost of capital for as long as possible. We can express excess returns as the difference between sales and costs (including the opportunity cost of capital) and the duration of excess returns as the result of competitive advantage.*

*In this section, we explore ways networks generate revenues, their cost dynamics, and how they sustain returns. Analysis of these drivers provides a foundation for assessing and judging appropriate valuations for network businesses.*

### *Sales*

*We need to consider two dimensions of sales: the sources and the growth rate. Both are important, but the rate of growth holds particular interest because it can be nonlinear when strong network effects exist. Since the stock market tends to be poor at discounting nonlinear growth, this may provide opportunities. First, we outline sales sources. Many established networks gather sales from more than one of these categories, and in some instances there are revenue opportunities that developed networks have yet to exploit. More than classifying sales, these categories provide a way to think about potential value creation.*

- *Commerce/transactions. Companies that are a de facto standard or stewards of a network can either sell goods directly or can steer customers to a transaction and collect a fee (indirect). Direct sales are conceptually straightforward and generally easy to track. The success of a company's indirect sales relates to its ability to reduce customer search costs. Large networks that can effectively direct users are very valuable.*

- *Advertising. A large user network attracts advertisers by allowing them to reach users cost effectively. Companies that amassed such groups can monetize them by selling advertising. Since an advertising-based business model is typically only viable for companies with a sizable user base, companies trying to build such a model often discount or give away their product in order to corral users. The give-away is a costly means to a profitable end: becoming an attractive vehicle for advertisers. This currently forms the core of Google's business model.*

*Subscription. Some successful networks can charge users a subscription fee, or dues, for access to a network and its content. Subscription models usually apply for one of two extremes: very specialized networks or very large networks.*

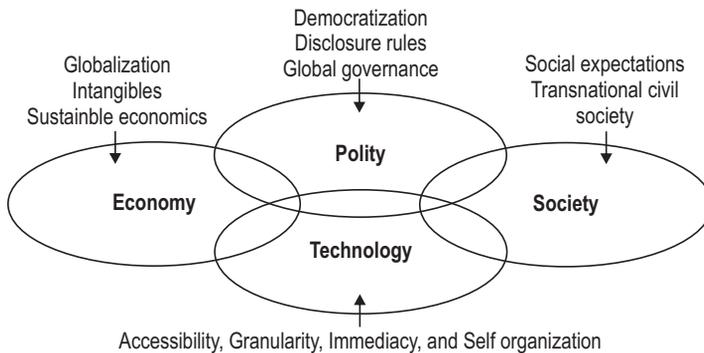
*Data. One of the benefits—and concerns—of the digital age is an unprecedented ability to*

collect information. Companies with large user bases, especially those Internet-based, have a treasure chest of data about their customers that is valuable because it can be sold to third parties. These data can be either aggregated, hence skirting privacy issues, or used to offer specific consumer profiles.

*Incubation.* Once established, a network can “link-and-leverage” its position into new business opportunities. This means transferring a user base to an adjacent technology or product. For example, Microsoft used its strong operating system position to capture adjacent markets in applications and Internet browsers.

Now that we have outlined revenue sources, we can return to the issue of growth rates. To do that, we must introduce and explore the notion of positive feedback—the idea that the strong get stronger and (as necessary corollary) the weak get weaker. We will explore two related facets of positive feedback: winner-take-most outcomes and supply- versus demand-side scale economies. Winner takes most. In the presence of network effects, the value of a good or service increases as more people adopt that good or service. But what happens when multiple products compete in a business subject to network effects? Often one company gathers the vast majority of market share—the winner takes most.

FIGURE B3: POSITIVE FEEDBACK



Source: Shapiro & Varian 1999, p. 177.

Consider the case of the VHS versus Beta video recorder standard-setting battle in the late 1970s and early 1980s. The two technologies competed across a range of features, including product design, picture quality, playing time, and price. While the point is in dispute, the two products were generally viewed as similar in capability.

Notably, the first application for video recorders was to tape shows on TV—there were no prepackaged cassettes. In 1976, Beta had over 60% market share (in units). By 1978, Beta’s share slipped to 40%, but unit sales growth remained strong and the product had a loyal following. Once the studios began to license content, the prerecorded videocassette market was born and network

effects strengthened. VHS had already reached a point of critical mass. Consumers had an incentive to buy a VHS because it had the most complementary content, which spurred more content, and so forth. In 1980 VHS's share climbed to 66%, by 1985 it was 92%, and it was in excess of 99% by 1988. Figure B 1.4 shows the pattern of winner-take-most battles.

Economist W. Brian Arthur says it more bluntly in what we can call Arthur's Law: Of networks, there will be few. In a particular space one network tends to dominate, while the rest fight over the scraps. Network builders understand that anything other than first place is an also-ran. Microsoft and eBay's 90%-plus market shares offer testament to this point. Natural monopolies are the progeny of strong network effects. One important idea here is path dependence, which in general means that history matters. Economists interested in innovation often point to path dependence to show why small events—random choices, luck, a chance meeting—can lead to outcomes unexplained solely by product attributes and features. While some economists doubt the role of path dependence, studies of networks outside of economics suggest that path dependence is an important consideration.

#### *Supply- versus demand-side scale economies*

The difference between a firm's sales and costs (including opportunity cost) determine whether or not it creates value. Fundamentally, a company can create more value by either reducing its costs or increasing the price it receives. Evidence suggests that differences in customer willingness-to-pay account for more of the profit variability among competitors than disparities in cost levels.

Positive feedback as a result of scale economies has been around for a long time. The well-known cost curve shows that as a manufacturing company increases its output, its marginal and average unit costs decline (to a point). For these companies, the positive feedback is supply-side driven. It's all about lowering costs. This is classic increasing returns-to-scale.

However, for manufacturing companies positive feedback tends to dissipate because of bureaucracy, complexity, or input scarcity. This generally happens at a level well before dominance: Market shares in the industrial world rarely top 50%.

For networks, the primary source of positive feedback is network effects. Rather than being supply-side driven, network effects are demand-side driven. This has two implications. First, the value to the users increases sharply once a network passes critical mass. Irrespective of costs, the willingness-to-pay rises.

Second, size does not govern market share for networks based on information. One network can, and often does, become totally dominant. Recognition of networks effects as the primary driver of increasing returns is key.

Source: Mauboussin, M. J. 2004.

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## 4.1 A Network Clustering of the Economy

The range of global competition is rapidly expanding through the modalities, particularly lately evident virtualization of network structures (legal and illegal), operating under the influence of economic and non-economic methods (M. Draskovic, 2006, p. 173). Many authors believe that the rapid development and commercialization of network business structure has been enabled by the boom of e-commerce and communication technologies. They are the foundation of network logistics, business standardization (quality, knowledge, behaviors, applying methods, etc.) and the institutionalization of modern business. Without analysing the various levels, fields, domains and contradictions of globalization, it appears that the clustering of businesses one of its dominant and essential economic determinants. According to E. Toffler, clustering is a “*new wave of capitalism development.*” Regardless of the formation approach obsolescence, ie the achievements of the “mixed society” and “mixed economy”, “knowledge society” and the like., some respective authors continue to force the term capitalism. Therefore is objectively relativised the civilizational theory of society development, that prefers this terminology. The formation of economic blocks (clusters) composed of companies and organizations that unite the human capital and other resources (technological, scientific and other potentials) is to create, maintain and increase their own competitiveness (benefits).

The evolution of modern global markets is based on a completely new behavioral rules (a high degree of interdependence and mutual dependence) and competition. Also, there is a new *paradigm of knowledge*, which is practically manifested through networking and clustering. Following the logic of permanent and almost exponential changes, the innovations (technological, organizational and other) arise as a necessity and a condition of success in networked markets (M. Draskovic, Ibid., S. 174). Business networking is a modern strategic need, a new model of entrepreneurial behavior and global mega-trend, actually based on finding the company competence and organizational-processing network, creating a flexible, synergic and competitive organizational structure (V. Draskovic, 2004, p. 126). This form of modern business clustering network has an increasing importance and role.

Development of clustering was initiated by M. Porter’s study of forming clusters in Arizona. Cluster is a network of independent manufacturing and/or services companies, including suppliers, technology authors and know-how (universities, research institutes, engineering centers, etc.), connecting market

institutions (brokers, consultants, logistics intermediaries etc.) and consumers. All of the above subjects are connected in a single chain of a value creation. As a basis of the cluster structure functioning is taken a “diamond” model of Porter’s “national rhombus”, presenting a concept of a country competitive advantage. It is determined by four factors:

- factor conditions and national position in the production factors (such as skilled labor or infrastructure necessary for a good competition in an specific industry),
- demand conditions (character of a domestic demand for the products or services of specific industry),
- linked or supporting industries, (presence or absence of supplying branches and other industries that are internationally competitive), and
- company strategy, structure and rivalry (how to create and organize the company, and how to manage it) (Porter 1990, p. 77).

In the example of various countries, M. Porter showed a direct correlation between innovation and creating competitive advantage (Ibid., p. 630), and thus improving the overall position of the international company. Related and supporting industries provide implementation of innovation on the line of spare parts and technical equipment. The growth of productivity is very important for stronger competitiveness of clusters. This can be achieved by various innovations in the technological and organizational fields, and by stimulating the new forms of business. That way, the boundaries of the cluster expand. The cross-section of different cluster activities, operating in the same geographical region, give similar results. The cross-section of reciprocal activities is marked with shaded surface. The clusters generate a complex combination of competition and cooperation, existing in various spheres and often are complementary, especially in the innovation processes. Precisely that provides the legislative participation as a unique entity of the network and competition, resisting the destructive wave of global competition. Of course, the above properties of clusters affect the realization of a uniform strategy and innovation policy, based on a significant reduction in transaction costs.

The phenomenon of clustering in developed countries is observed for almost two decades, from the moment when it became a foundation of economic politics, imposing the information-analytical work and coordination of educational programs at all levels, in line with the needs of the cluster. That involves a high level of support for science, innovation, export orientation, building information infrastructure, education and macrologistic. The literature cites the example of Finland, which holds only 0,5% of the world’s timber resource, but exports 10%

of the world's wood-processing, 25% of the paper, 30% of cell-phones, and 40% of the telephones (Ibid., p. 82). The network organizations increasingly implement the *idea of virtuality*, which is enabled by the development of electronic markets and trading operations, virtual goods and virtual organizations. More than a decade ago, W. Davidov and M. Malone (1992) referred to the "virtual corporation" as a new strategy of reorganization that may dominate in the 21st century. It is essentially a flexible and dynamic organizational system (connected to a network and computer) and as such is able to make a selection of the most improved (inhomogeneous and remote) resources and combines them (if necessary, time-limited) with the resources of other companies for better adjustments to the market. Virtual organizations are often based on information resources integration, and therefore are called a quasi-enterprises. But since such organizations integrate and coordinate the various cultures, goals, knowledge, tradition, remote and heterogeneous resources, work experience, habits, etc., they are also called a meta-enterprises. Criteria for distinguishing the virtual enterprises are legal, geographic, economic, system-network, and others.

The role and importance of "virtuality" is becoming greater, as appropriate organization has all the features of traditional, unlike fixed structural, institutional and time frames. It is defined as a voluntary cooperation of horizontally and informatively networked, equal and independent partners (companies, institutions, private individuals, etc.), which function on the basis of mutual trust for optimization of the business processes and mutual benefit, which is shared by the volume of the investments. Although the virtual enterprise has no legal basis, it acts as a unique, dynamic network, thanks to the most advanced information and communication technologies. The function of top management is not institutionalized, and the term "virtual" refers primarily to creating a time-bound situational competency that enables rapid response to changes in the environment and an optimal realization of the market goals. This competency usually involves allocation of resources, knowledge management, and marketing. The future of business belongs to the "virtual organizations", meaning the network of several independent firms (which may be rivals), customers, suppliers, institutes, and other interested organizations. The networking is based on highly sophisticated information systems that enable rapid agreement and cooperation in knowledge distribution, costs, risks, and access to certain markets, although they have no common organization and management. Communication between partners is fast, full, open, without procedures, with great confidence and top investment specialists, and the ability to efficiently perform specific tasks.

The above partnerships have formal and volatile character, lasting only as long as there is a mutual shared interest. The network business collaboration

and cooperation are more efficient means of survival in the market than the competition, where partnership combines the property. The modern virtual team partner “unions”, based on flexible business and organizational systems, represents a reliable and powerful alternative to transnational diversification and vertical integration.

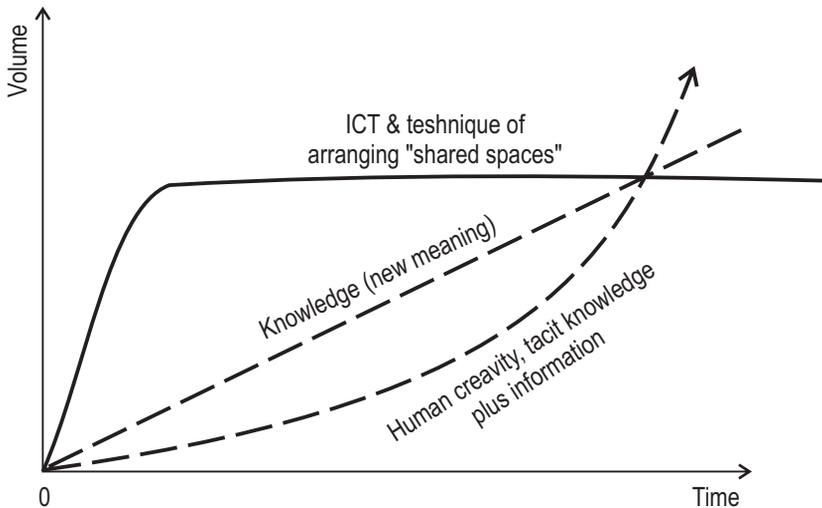
TABLE 1.6: KEI FOR SELECTED COUNTRIES IN 2012.

Rank	Country	KEI	KI	Economic Incentive Regime	Innovation	Education	ICT
1	Sweden	9.43	9.38	9.58	9.74	8.92	9.49
2	Finland	9.33	9.22	9.65	9.66	8.77	9.22
3	Denmark	9.16	9.00	9.63	9.49	8.63	8.88
4	Netherlands	9.11	9.22	8.79	9.46	8.75	9.45
5	Norway	9.11	8.99	9.47	9.01	9.43	8.53
6	New Zealand	8.97	8.93	9.09	8.66	9.81	8.30
7	Canada	8.92	8.72	9.52	9.32	8.61	8.23
8	Germany	8.90	8.83	9.10	9.11	8.20	9.17
9	Australia	8.88	8.98	8.56	8.92	9.71	8.32
10	Switzerland	8.87	8.65	9.54	9.86	6.90	9.20
11	Ireland	8.86	8.73	9.26	9.11	8.87	8.21
12	USA	8.77	8.89	8.41	9.46	8.70	8.51
22	Japan	8.28	8.53	7.55	9.08	8.43	8.07
26	Czech Rep.	8.14	8.00	8.53	7.90	8.15	7.96
27	Hungary	8.02	7.93	8.28	8.15	8.42	7.23
28	Slovenia	8.01	7.91	8.31	8.50	7.42	7.80
32	Lithuania	7.80	7.68	8.15	6.82	8.64	7.59
33	Slovak Rep.	7.64	7.46	8.17	7.30	7.42	7.68
38	Poland	7.41	7.20	8.01	7.16	7.76	6.70
39	Croatia	7.29	7.27	7.35	7.66	6.15	8.00
44	Romania	6.82	6.63	7.39	6.14	7.55	6.19
45	Bulgaria	6.80	6.61	7.35	6.94	6.25	6.66
49	Serbia	6.02	6.61	4.23	6.47	5.98	7.39
55	Russian Fed.	5.78	6.96	2.23	6.93	6.79	7.16
56	Ukraine	5.73	6.33	3.95	5.76	8.26	4.96
57	Macedonia	5.65	5.63	5.73	4.99	5.15	6.74
70	Bosnia and Herz.	5.12	4.97	5.55	4.38	5.77	4.77
82	Albania	4.53	4.48	4.69	3.37	4.81	5.26
84	China	4.37	4.57	3.79	5.99	3.93	3.79
110	India	3.06	2.89	3.57	4.50	2.26	1.90

They provide adaptable synergistic competence of different companies, concentrated in a strong virtual competitor, which brings benefits to everyone. Some believe that the knowledge society is a higher form of information society, elevating the knowledge above information. It has its own logic, because knowledge is still a major development resource, the initiator of change and innovation creator.

Apart from information and communication technology (ICT), in the structure of the knowledge society also participate the education, innovation and economic institutions (economic incentives). These four areas (so-called "pillars") of the knowledge society are, in order to measure the level of development, divided into 109 structural and qualitative indicators, using *The Knowledge Assessment Methodology* for each country.

FIGURE 1.5: MASS PRODUCTION OF KNOWLEDGE: EVOLUTION OF MAIN FACTORS OVER TIME



Source: United Nations 2005, p. 68.

The goal of mankind is a the mass production of knowledge. According to the UN report (2005) people (as carriers of tacit knowledge) and informa-

tion (public knowledge) actively participate in it. Informations are a reflection of human creativity and they lead to creating a “new meaning.” The profit from a revolutionary introduction of ICT is enormous. But the time will come (point A in Figure 1.5) and this rapidly growing trend of this mass production method of knowledge will deplete. From that point, the burden of mass production of knowledge will fall on human creativity. Distance between points A and B will depend on the degree of institutional change and implementation of appropriate institutional arrangements. After point B, the development of knowledge in a “new meaning” of the term will depend solely on the hidden knowledge and information quality.

## 4.2 The Process of Value Chain in the Network Economy

Value chain view of a company helps us to understand the increase of value along the chain of activities in bringing a final offering to stakeholders. Value chain analysis allows us to see where value is added and how it might be increased. It is the tool for maximizing profitability of companies throughout maximizing value at minimum cost by allocating resources to those activities that generate the most value. Value chains always had a limited life in competitive markets, but are now eroding much faster than in the past (see Eustace, 2003). The new factors of differentiation (called “non-priced” factors) become the main force of competition. Therefore, those factors are a dominant source of competitive advantage. Roos (2005) pointed out that “intellectual capital”, creates value when its elements are combined and put into action, and degrades when they remain unused. This suggests that having a resource is not enough to create value. In order to create or leverage value, the resources have to be deployed effectively and efficiently. The effectiveness of knowledge transfers and conversions is the key to value creation Sveiby (2001).

Carlucci et al. (2004) demonstrate that effectiveness and efficiency of performing organizational processes are based on organizational competencies and the generated value is the result of an organization’s ability to manage its business process. Martr (2005) suggested that knowledge assets interact with each other to create competencies and capabilities, and it is often these interactions that provide a competitive advantage because they make these assets difficult for competitor to replicate. These value drivers are bundled together, and the interactions between them are varied, complex and dynamic making difficult to demonstrate the cause and effects relationships and its linkage to value

outcomes. The traditional value chain has been improved with more complex ways of creating value, such as *value shops*, *value networks*, and *value constellations* (Haanes, 2000):

- *Value shops* create value by solving unique problems for customers by using relevant competencies. Examples of companies that create value as ‘shops’ include accountants, academics, physicians, designers, lawyers, investment bankers, business consultants, and consulting engineers.
- *Value networks* create value by making different products and services available to customers. The value is derived from the network giving buyers access to sellers of what they want, and by putting suppliers in contact with customers who want their products. Examples of companies creating value through networks include commercial banks, airlines, postal agencies, insurers, brokers, and stock exchanges, and
- *Value constellations* can be considered to be linked sets of different value networks.

FIGURE 1.6: RESOURCES AND CAPABILITIES OF A FIRM

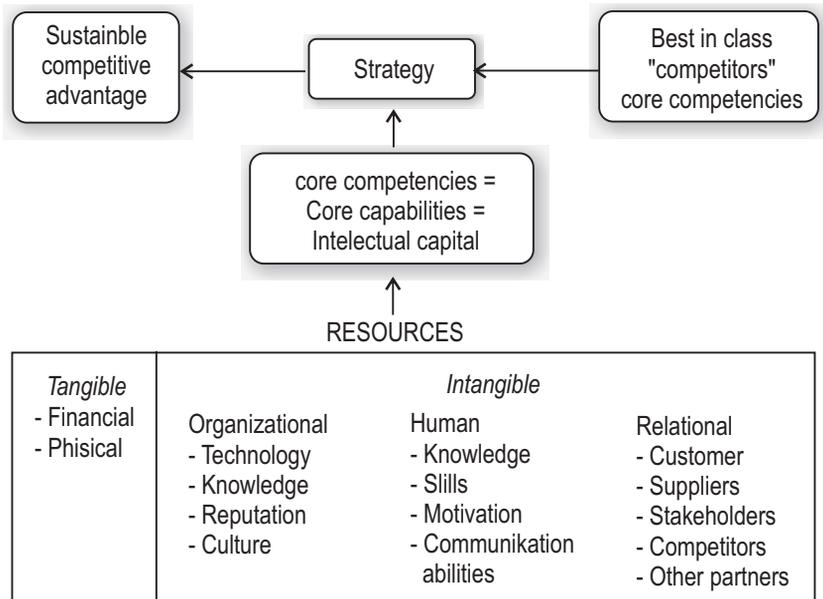
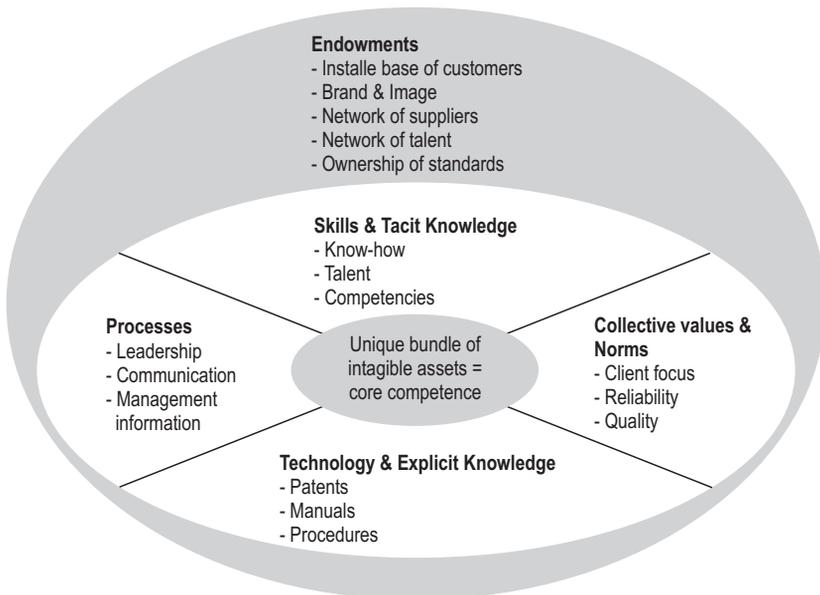


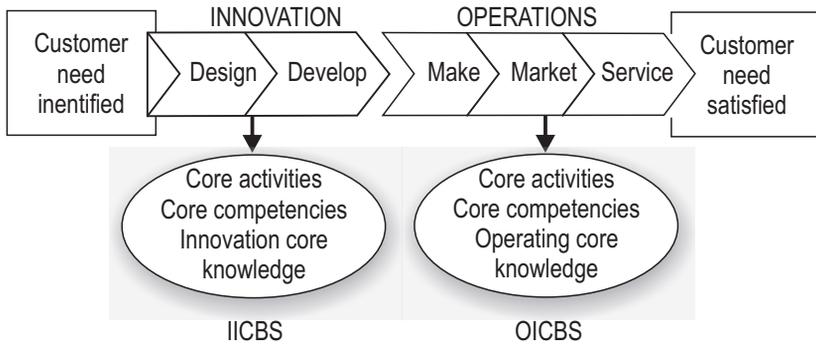
Figure 1.6 summarizes the above discussion on resources and capabilities, and Figure 1.7 shows the major intangible assets within a core competence (Andriessen, 2001). The term “core competencies” refers to a unique bundle of intangible assets that are the basis of the definite, sustainable, competitive advantages. In adopting this perspective, the terms “core competencies” and “core capabilities” are used interchangeably and also the term “intellectual capital” considers to be an equivalent expression. This approach is in agreement with Sullivan (2000, PP. 3-18) who defined intellectual capital as knowledge that can be converted into profits or knowledge that produces value. Figure 1.8 illustrates the business process broken down into two constituent parts. The innovation process points to new products and services through the innovation value chain in which innovation capabilities are basic and fundamental. Core capabilities represent a potential and, therefore, cannot contribute to competitiveness unless they are successfully translated into new processes, products and services. This is the role of innovation management. The Innovation Intellectual Capital Benchmarking System (IICBS) has a specific system for the innovation process.

FIGURE 1.7: A CORE COMPETENCE AS A UNIQUE BUNDLE OF INTANGIBLE ASSETS



Source: Andriessen 2001.

FIGURE 1.8: BUSINESS PROCESS VALUE CHAIN



The operations process, which produces ordinary products and services through the systematic and repetitive operations value chain, also requires core competencies and core capabilities to be competitive. However, these competencies and capabilities will probably be of a different nature from the ones mentioned above in the discussion of the innovation process. ICBS also has a specific process for the operations value - the Operations Intellectual Capital Benchmarking System (OICBS).

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### **Box 5 - TRANSPARENCY IN THE NETWORKED ECONOMY**

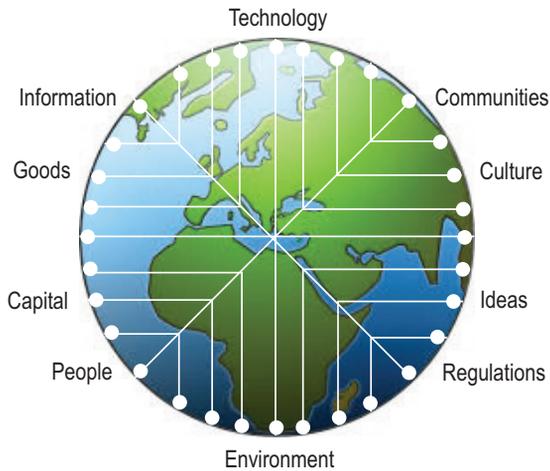
*“The new social order, the network society, increasingly appears to most people as a meta-social disorder. Namely, as an automated, random sequence of events, derived from the uncontrollable logic of markets, technology, geopolitical order or biological determination.”*

*M. Castels*

*The increasing demand for transparency can be largely attributed to forces and consequences of globalization. To be sure, globalization is not new. As prominent scholars point out, it has been a feature of human civilization for centuries, expanding and retracting, intensifying and declining, throughout history.<sup>5</sup> Never before though, has globalization been so vast, so intense and all-encompassing. Global interdependence has become a defining feature of our time as people, money, technology and ideas relentlessly cross borders in a vast network of transactions and social exchanges.*

As globalization creates massive transboundary flows that transcend the boundaries of geographically defined nation-states, it tightly binds together the fortunes and relations of people and institutions around the world. In fact, Anthony Giddens, director of the London School of Economics (LSE), defines globalization as “the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa.”<sup>6</sup> In a tightly integrated economy, a financial meltdown in one region can immediately impact the economies on the other side of the world, while investment decisions made on Wall Street, can rapidly shift money, jobs and production from one community to another. The nuclear meltdown in Chernobyl shows that environmental disasters know no national boundaries, just as the flow of drugs, diseases and weapons moves readily from continent to continent. As the world shrinks, we become ever more aware of the multi-leveled ways our fortunes are overlapping. This phenomenon, often referred to as time-space compression, is intensified as the Internet and a global media system not only render the distant more proximate, but also reinforce our consciousness of this interconnectedness.

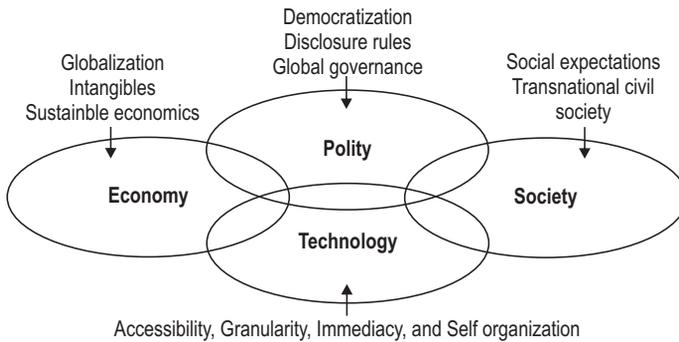
FIGURE B4: NETWORKED ECONOMY



Time-space compression not only reduces spacial barriers, it also brings into acute awareness the many ways our world is speeding up. Nowhere is the compression of time more evident than in our contemporary systems of production, exchange and consumption. Improved systems of communication coupled with rationalizations in the techniques of distribution (e.g., packaging, shipping and inventory control) made it possible to circulate commodities (legal and illegal) throughout the global market with greater speed. The advent of electronic banking increased the flow of money, while computerized trading systems makes, as the saying has it, “twenty-four hours a very long time” in the global stock markets.

The combined impact of collapsing spacial barriers and accelerating time is inflicting a deep sense that the world is slipping into disorder. As Manuel Castells, author of *The Network Society*, states, “The new social order, the network society, increasingly appears to most people as a meta-social disorder. Namely, as an automated, random sequence of events, derived from the uncontrollable logic of markets, technology, geopolitical order or biological determination. It is within this context that random events and decisions can have rapid and potentially catastrophic impact on those who were never consulted, or perhaps were not even aware of the stakes in the first place. And it is this state of affairs that makes transparency increasingly salient in our attempts to bring order to the world.

FIGURE B5: TRANSPARENCY IN THE NETWORKED ECONOMY



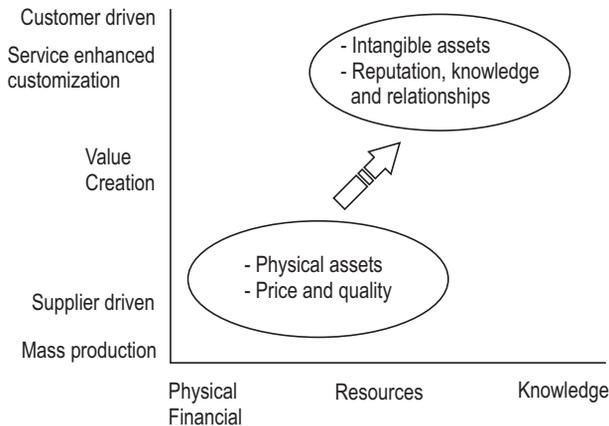
Transparency is a response to time-space compression and the growing awareness of our overlapping collective fortunes. The more we become connected and interdependent as societies the more we want to know about the affairs of others. As Ann Florini says, “Many people are affected by, and thus want to have a say in, what used to be other people’s business.” One country’s development of weapons of mass destruction, for example, becomes a concern for everyone within reach of their devastating capacity. Indeed, it’s not surprising that arms control has become one of the predominant applications of transparency in global politics. Since the end of the Cold War, major world powers have agreed to engage in a highly intrusive regime of mutual scrutiny of one another’s military forces. Similarly, environmental problems that cut across national borders have increased our awareness of our collective dependence on common ecological systems and spawned a wide range of efforts to monitor and report on the state of our environment. A new form of “regulation by revelation” has come into existence in which public websites operated by NGOs shame polluters by disclosing their toxic chemical releases in local communities. The unifying theme in these examples is that new interconnections and increasing levels of interdependence require a commensurate level of trust and transparency to ensure stability in the world.

In the previous sections we talked about the rise of transparency in the context of other major developments that are transforming our world: namely, the rapid expansion of political and eco-

conomic interdependence created by globalization, and the pervasive change of thinking about the relationship of corporations to society. The subsequent section attempts to dig deeper into the key drivers and enablers of transparency, that is, the specific forces that create the social organization, regulatory regimes, technological platforms and economic rationale for greater transparency in the future. In doing so, we provide an analytical framework for understanding the current state and likely trajectory of transparency.

Our investigation of the drivers of transparency is rooted in an analysis of the forces and dynamics at play in Digital 4Sight’s concept of a networked world. A networked world is, by our definition, a world in which the dominant functions and processes of the economies and societies are organized around networks. Leading sociologist and author of *The Network Society*, Manuel Castells, defines networks as “open structures, able to expand without limits, integrating new nodes as long as they are able to communicate within the network, namely, as long as they share the same communication codes (for example, values or performance goals).”

FIGURE B6: CHANGING ECONOMICS OF THE INFORMATION-BASED ECONOMY



As Castells argues, networks are appropriate instruments for most contemporary institutions in society, including “a capitalist economy based on innovation, globalization and decentralized concentration; for work, workers and firms based on flexibility and adaptability; for a culture of endless deconstruction and reconstruction; for a polity geared toward the instant processing of new values and public moods; and for a social organization aiming at the supersession of space and the annihilation of time.” For analytical purposes, we have broken down our concept of the networked world into four key elements: society, polity, economy, and technology. Within these four spheres we see evidence of profound transformations taking place that will continue to amplify the transparency of the business environment.<sup>18</sup> These social, political, economic and technological forces are described briefly below to lay the foundation for an extensive discussion about the implications of

*the transparency phenomenon for stakeholder relationship management, corporate communications, and corporate values.*

*The rise of intangibles as a primary driver of value creation plays an important role in the growth of corporate transparency. Intangibles are factors that affect business and economic outcomes but are not easily recognizable, measurable, or quantifiable in economic terms. They include knowledge, relationships, goodwill, experience, social capital, and brand recognition. It is easy for companies to focus on tangible factors to the exclusion of such intangibles. Indeed, corporate managers focus on questions regarding tangibles primarily (e.g., is revenue going up or down? Have we sold more or fewer products and services? What are our costs per unit? Is productivity improving or declining?). The focus on tangibles, albeit important, can overshadow the intangible dimensions of how value is created in the economy. Recently, however, business literature has begun to broaden our notion of how intangibles affect the performance of business enterprises in the marketplace. This shift in thinking has given rise to new management processes that help cultivate and leverage intangibles, as well as accounting practices that attempt to add them to the balance sheet.*

*The centrality of intangibles is linked to the changing economics of the information-based economy. In an information economy, companies no longer compete solely on the price, quality or availability of their products - although these fundamentals are still important. Firms must provide much higher value at much lower costs to capture and retain the scarce attention of customers. This means they need to compete more on the basis of their ability to create knowledge, sustain relationships and build a reputation as a great company. Increasingly, the ability to compete on these assets is tied to whether the vision, values, ethical stance, and leadership of the company are in alignment with the expectations of a broad set of stakeholders. Until recently, however, the importance transparency in managing intangible assets has been overlooked.*

*Source: Williams 2003.*

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## 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, brining 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”.

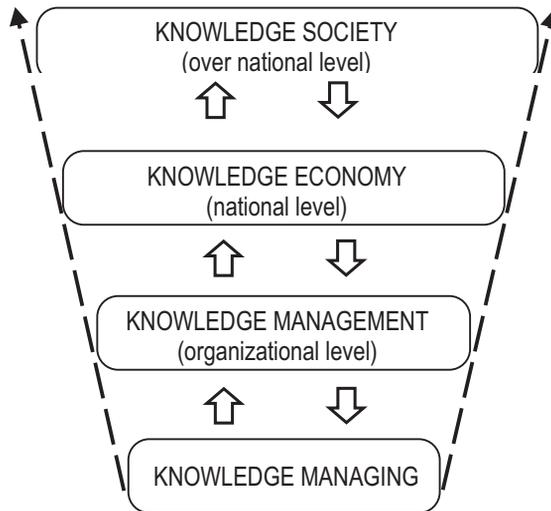
It means overcoming the traditional way of thinking, behavior and organization, because “associative people” have a higher level of a creative thinking (knowledge). This is era of fast, dramatic, complex and unpredictable changes. Technological, market, economic, political, social, institutional, and 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, re-search 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

***Traditional resources***

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

***Information resources***

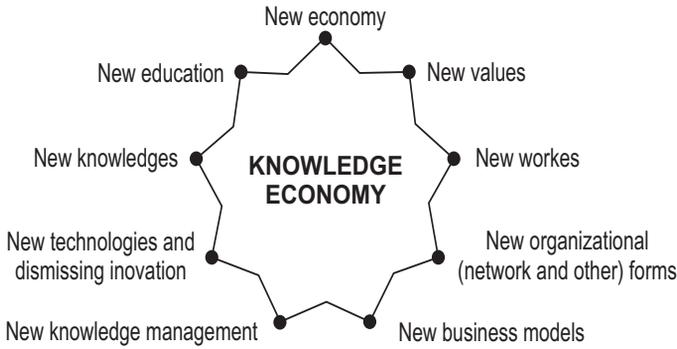
limitlessness (availability),  
 intangibility,  
 discretion,  
 consistency (non-vanishing),  
 new structure and quality of employment,  
 network effects with increasing border  
 usefulness,  
 non-material stocks and flows,  
 expanding in the usage process,  
 public good,  
 low-cost circulation,  
 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. Machlupa 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.

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### **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 en gine 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 commons<sup>1</sup>) 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.

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## 1.1 Concept, Types, Characteristics and Importance of Knowledge

**D**emands 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

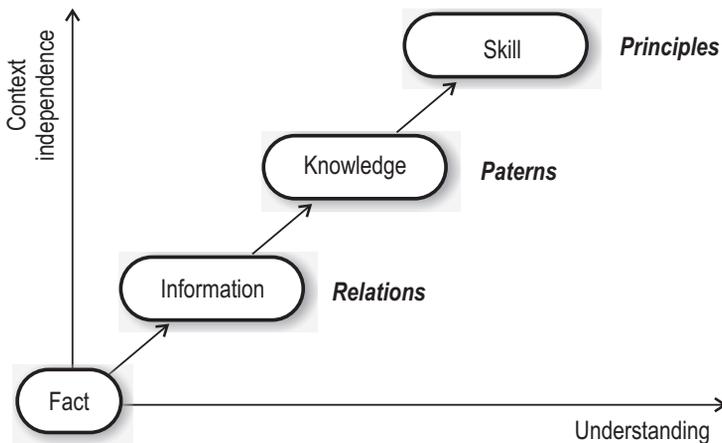
term data, information and knowledge are sometimes permuted, they must be terminologically delimited and explained. Conceptual distinction between data, information, knowledge and wisdom has been given by R. Ackoff (1989) in the “hierarchy” or so-called “pyramid of knowledge”. According to him, the human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

- *Data* is unorganized and unprocessed facts, which is static, does not allow judgements, does not represent a basis 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 appeared 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.

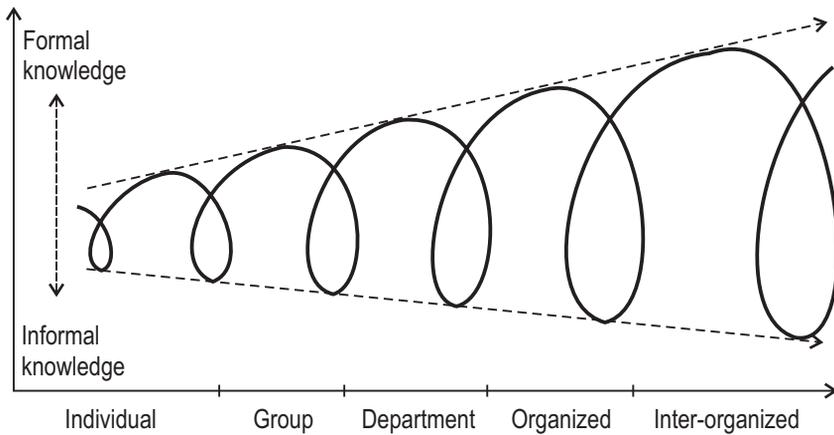
Schoetze (OECD Papers 2000, p. 169) distinguishes three types of knowledge flow: education and training, synthesis of knowledge from different disciplines, and diffusion, transfer and knowledge sharing.

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

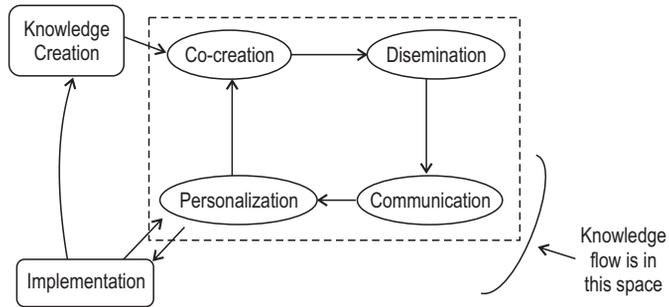
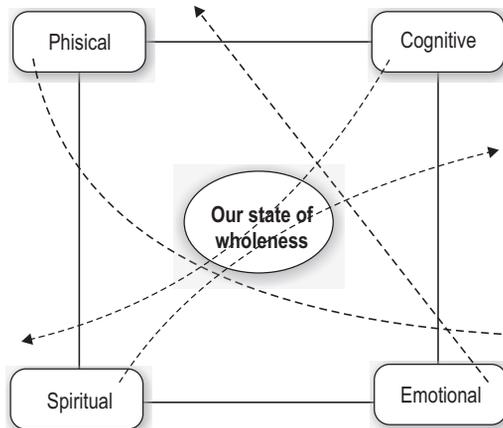


FIGURE B8: DOMAINS OF KNOWING



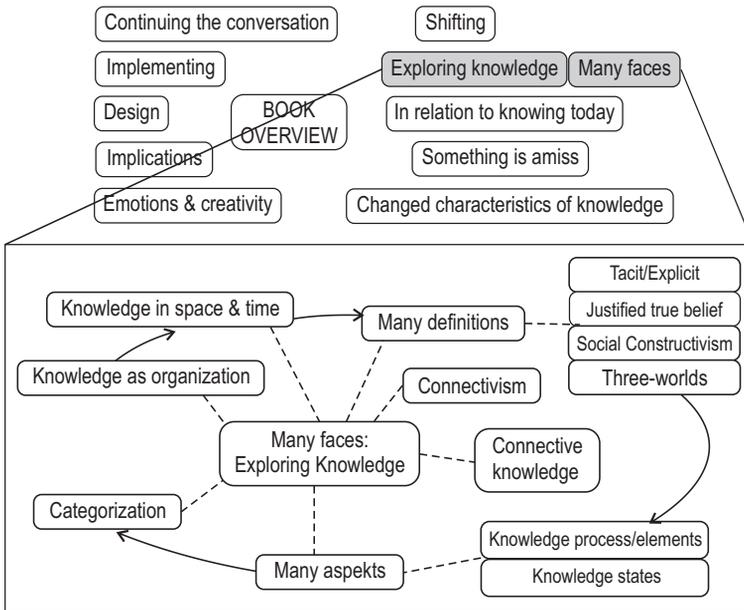
*We dance and court the knowledge of others—in ways the original creators did not intend. We make it ours, and in so doing, diminish the prominence of the originator. Cognitive, emotional, physical, and spiritual domains of knowledge interact in a myriad of ways. Life is not lived in a silo. Artificial constructs may be useful for categorization, but fail to capture the true richness and interconnectivity 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. Innovation<sup>3</sup> 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.

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3 Definitions of innovation: “*The three stages in the process of innovation: invention, transition 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.

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### ***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.

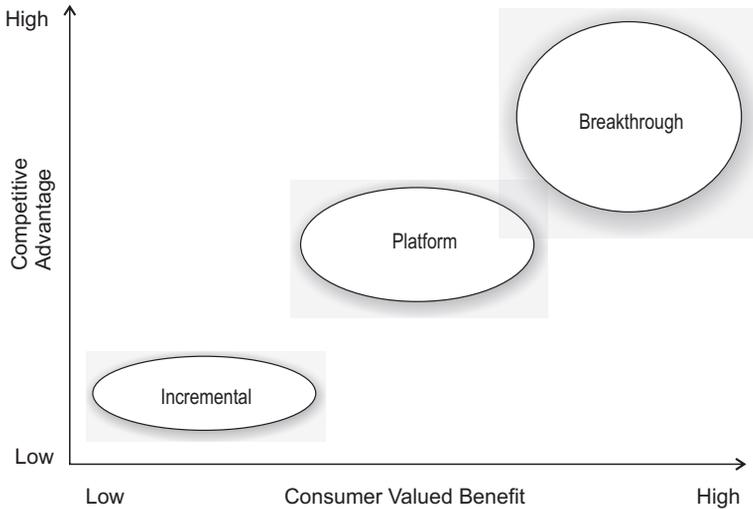
Meanwhile, in contrast, companies that take a bolder, more balanced, and more far-sighted approach to innovation are on the opposite trajectory: becoming a high-performing organization. They trace a virtuous cycle in which a balanced portfolio of successful innovations—including incremental, platform, 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=&escr=s&source=web&cd=11&ved=CCYQFjAAOa&url=http%3A%2F%2Fwww.accenture.com%2FSiteCollectionDocuments...>

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### **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.

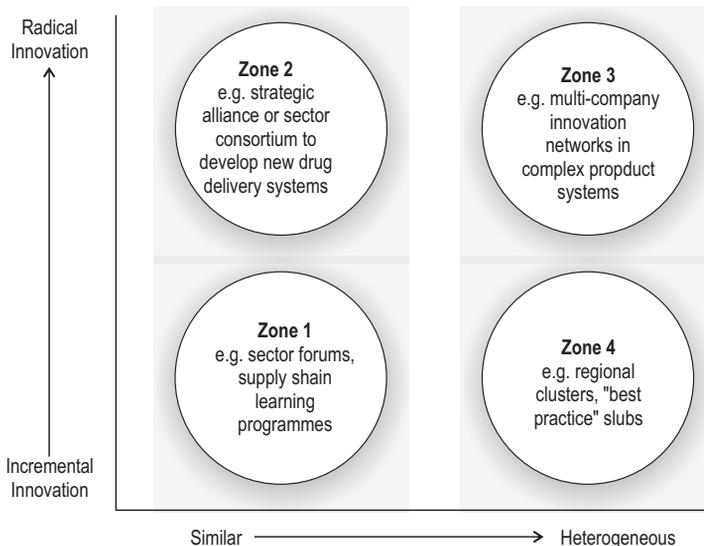
Source: Adapted from Tidd, Bessant and Pavitt, 2005.

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 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.

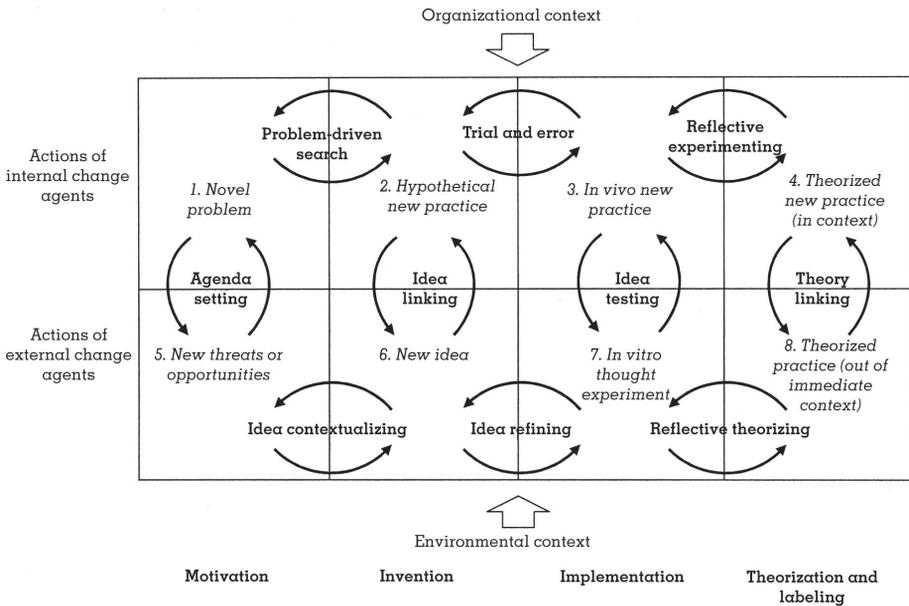
Source: Tidd 2006.

### **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 Abrahamson 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.

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### 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, un-bureaucratic 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 \$

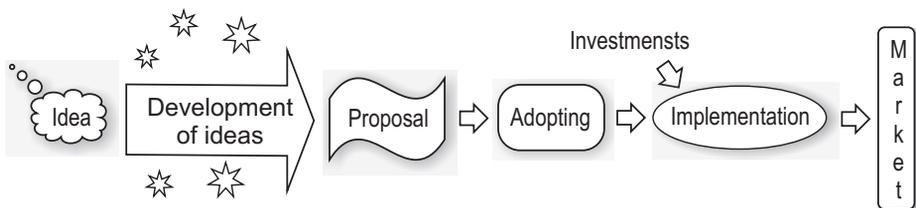
562,568. He explained the observed difference by the fact that “*knowledge capital was the way of organizing extract knowledge from information resources.*”

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 interviewers (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



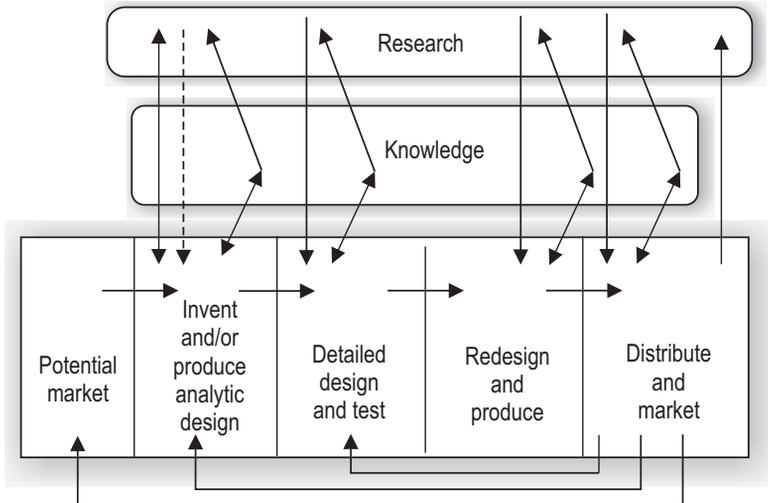
D. Lajovic and others (2012, p. 139) state that the process of innovation runs in three steps: a) *invention* - conceiving new ideas, creating conditions and opportunities for a new product, service and/or process, mainly using the technical criteria, b) *innovation* - market confirmation of invention, 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 an 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.

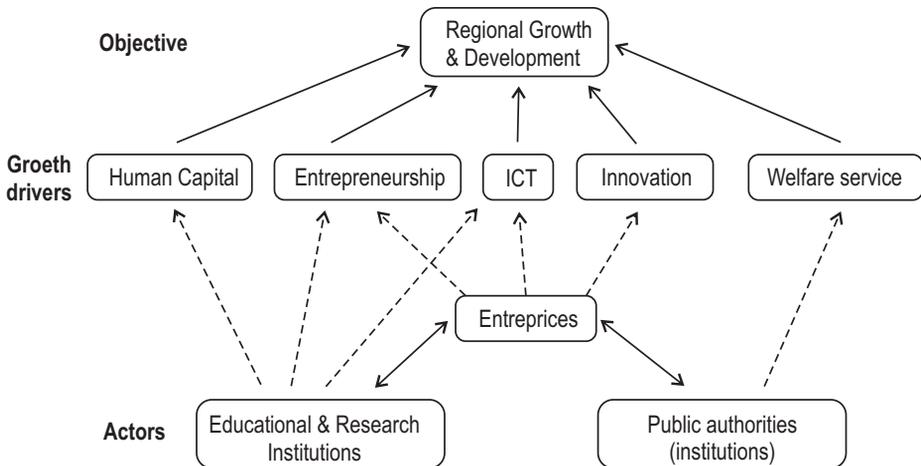
## 1.4 Innovations and Knowledge Economy

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).

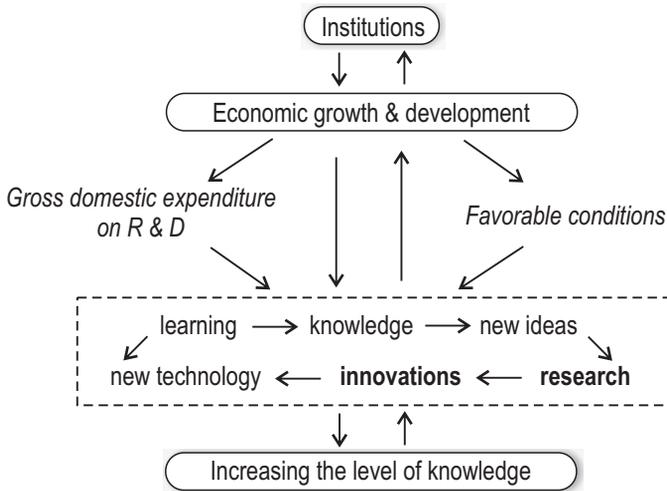
## 1.5 Institutional effect on innovations

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 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 of 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	<i>Estonia</i>	19	30
Norway	5	8	<i>Czech Republic</i>	26	44
New Zealand	6	2	<i>Hungary</i>	27	55
Canada	7	11	<i>Russia</i>	55	53
Germany	8	16	<i>Ukraine</i>	56	132
Australia	9	18	<i>Slovenia</i>	28	58
Switzerland	10	5	<i>Croatia</i>	39	98
Ireland	11	19	<i>Montenegro</i>	60-70	62
Unit. Kingdom	14	13	<i>Serbia</i>	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 62<sup>nd</sup> position and in terms of institutional development 74<sup>th</sup> and by the factor of innovations 69<sup>th</sup> 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 39<sup>th</sup> position by KEI index in the year 2012, but in the same year Croatia was on 77<sup>th</sup> position by GCI index, and in terms of institutional level 98<sup>th</sup> position and in terms of innovation factor 85<sup>th</sup> 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. lx) 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:

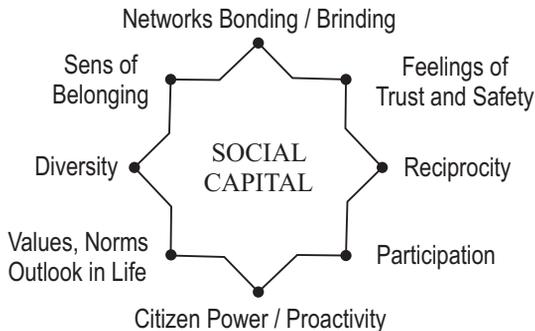
- *financial capital* (cash, savings, lines of credit, assets),
- *human capital* (natural qualities: charm, health, intelligence, knowledge, skills, education, work experience and so on.), and

- *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 & Bullen 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).

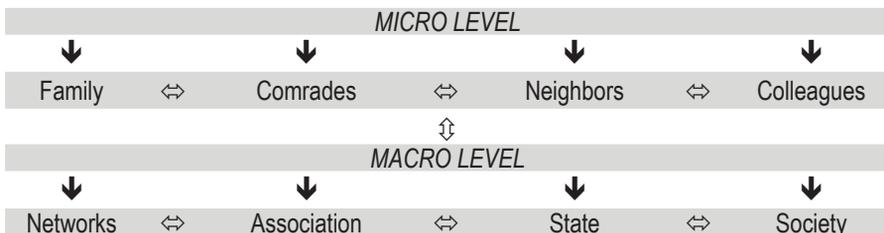
Social capital has a positive effect on the realization of economic transactions and costs reduction, manufacturing, confidence, risk-taking, negotiation quality, misinformation reduction and so on. The World Bank there includes institutes, relationships and norms that form the qualitative and quantitative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

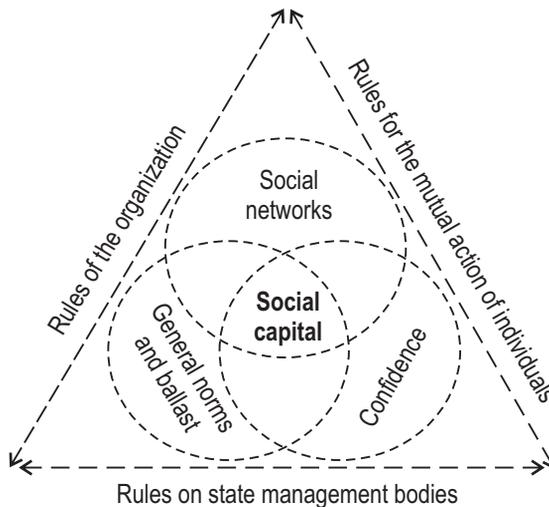
- *Purposefulness*. Many social networks does not necessarily grow into social capital, but those links help the individuals to achieve a particular goal. Social network and social capital are different things. Social network is an element of social capital, only if such social connections are beneficial;
- *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)

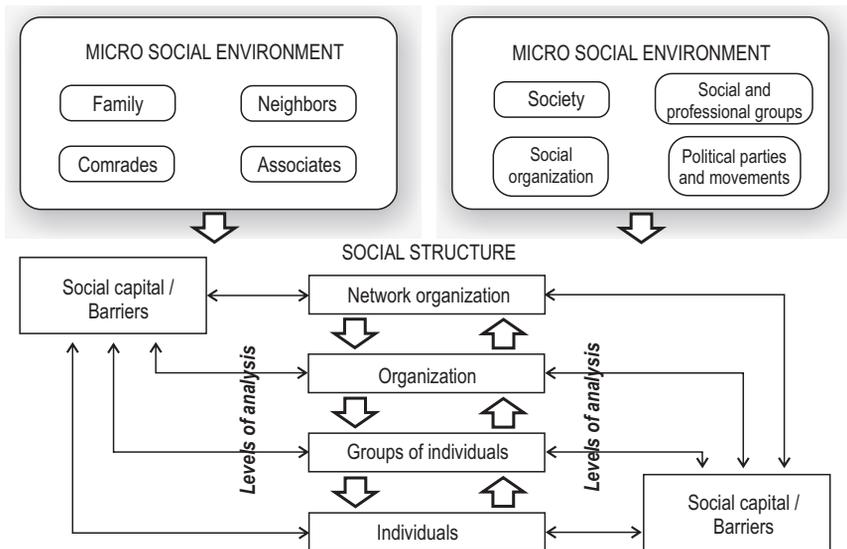
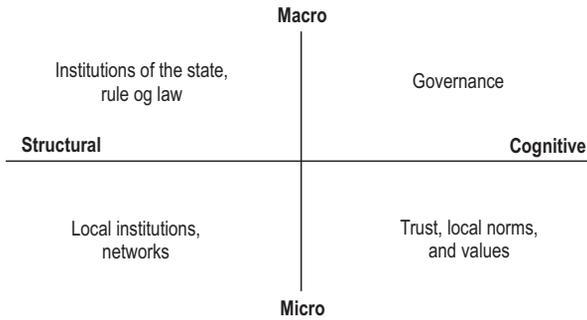
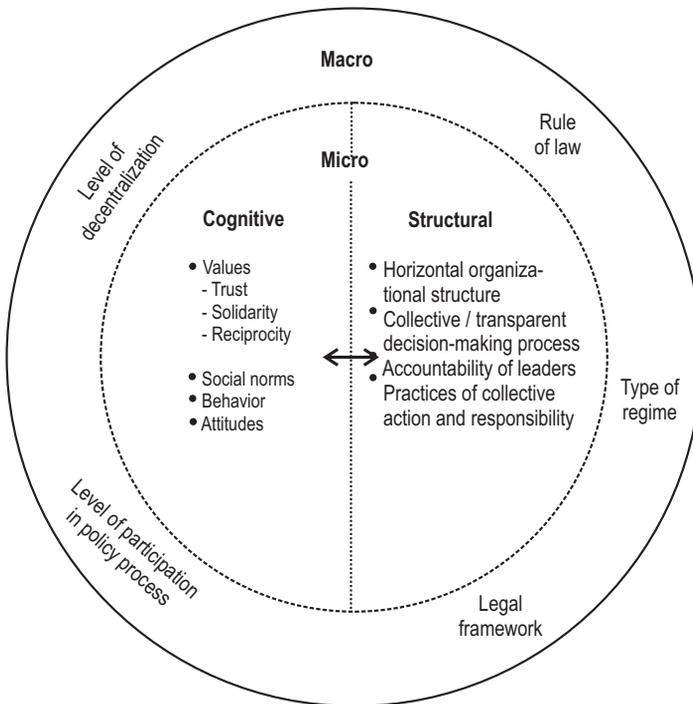


FIGURE 2.14: CONCEPTUAL FRAMEWORK: LEVELS AND TYPES OF SOCIAL CAPITAL



Source: Grootaert & Van Bastelaer 2002.

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

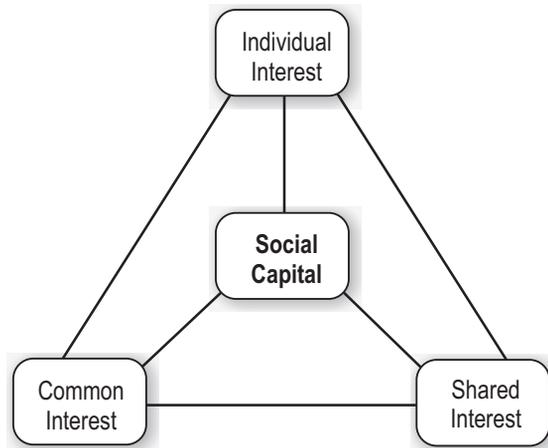


Source: Bain and Hicks 1998.

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.”*

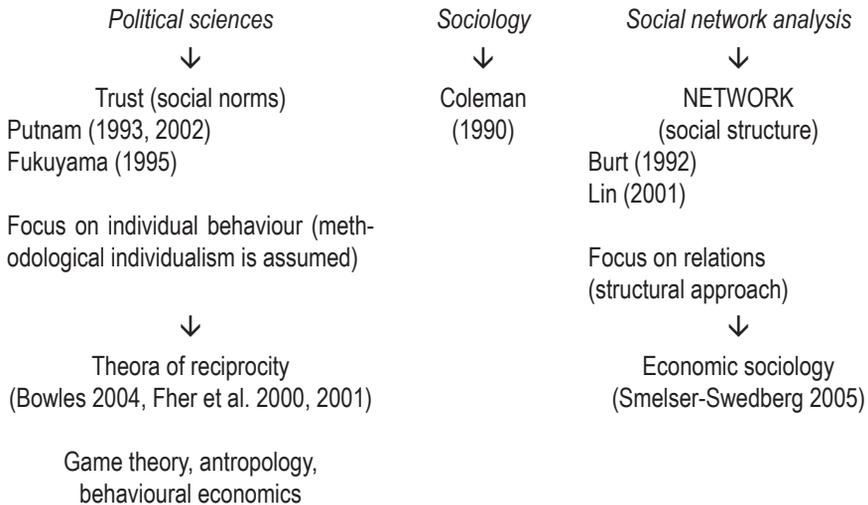
Social capital is, in our view, an engaging experience of relationship of networks. It is all about a relationship between individuals, entities and other social norms. Uniqueness of it reflects on trusting relationship that adds values, opportunities and possibilities which helps in promoting a quality 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



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.

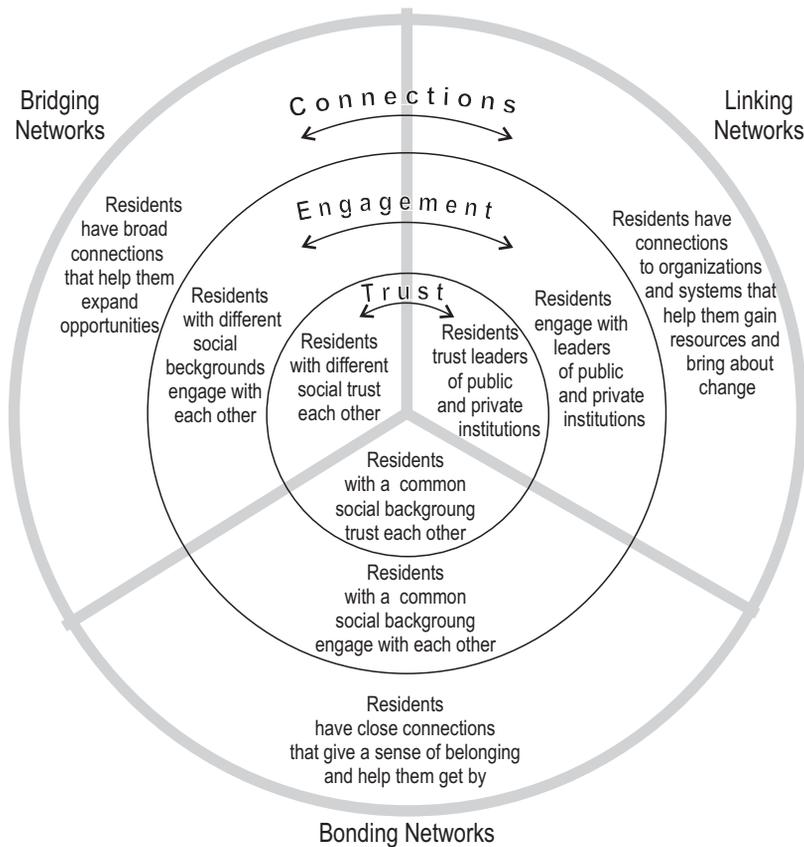
**Cooperation.** The ability to maintain authentic and transparent lines of communications allows for the clarification of expectations and ongoing accountability. When everyone involved on a project is clear on common goals and what each party is undertaking and accomplishing toward their achievement,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

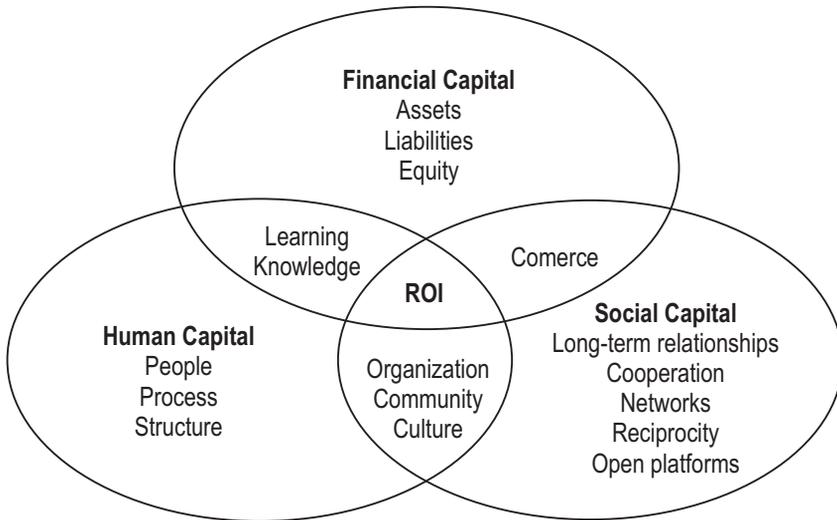
that by helping someone else they will be more likely, in return, to help you. When your knowledge and experience is available online and off for people and companies in your network, often their knowledge and experience is available for you in return. This growing resource is worldwide in its capacity, 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](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>	<i>Authors</i>	<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'

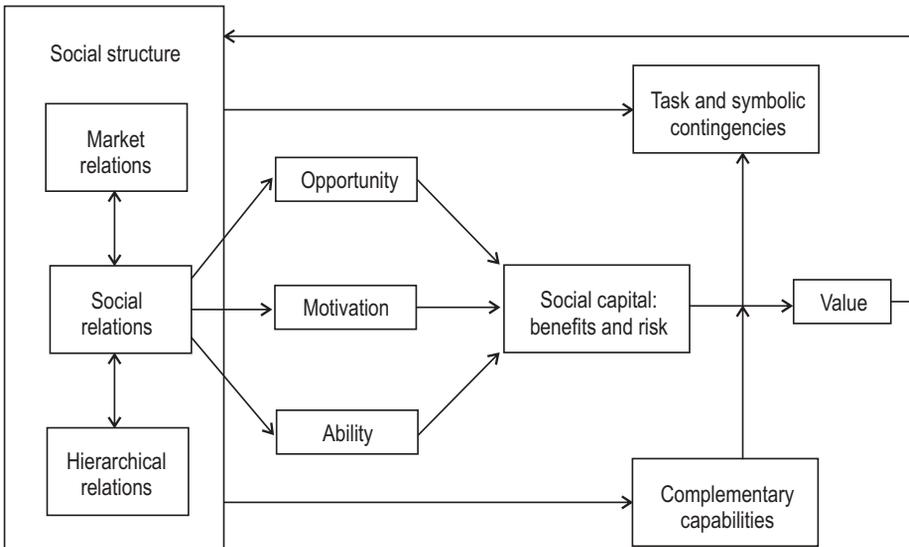
	Coleman, 1990	'Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure'
	Fukuyama, 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 & Sensenbrenner, 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 INTELLECTUAL CAPITAL

**H.** 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, i.e. 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

<p><b>Initiators of ideas i. k.</b>                  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. Shumpeter (recombination of knowledge and process innovation as factor of economic growth)                  H. Simon (limited rationality)</p>	<p>→</p>	<p><b>Creators of human capital conception</b></p> <p>G. Becker                  T. Shults                  K. E. Sveiby</p>	<p><b>I. k. organizations</b>                  T. Stewart, E. Brooking, D. Klein, L. Edvinsson, M. Malone, P. Sullivan</p> <hr/> <p><b>New macroeconomic conception</b>  <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. Kendrick, T. Shults  <i>Japans school:</i>                  H. Itami, I. Nonaka, S. Tsuchiya</p> <hr/> <p><b>Assessment i. k. of society</b>                  N. Bontis, A. Bonfour, L. Edvinsson,</p>
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In his book *The Tacit Dimensio* (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 WOKRS IMPORTANT FOR DEVELOPMENT I. C. CONCEPTION

Year	Autohor	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	“Profi ting 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 devise 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 Edvinssonom	
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](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
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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 use 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 a 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, leded 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 management processes, 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.<sup>8</sup> 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.

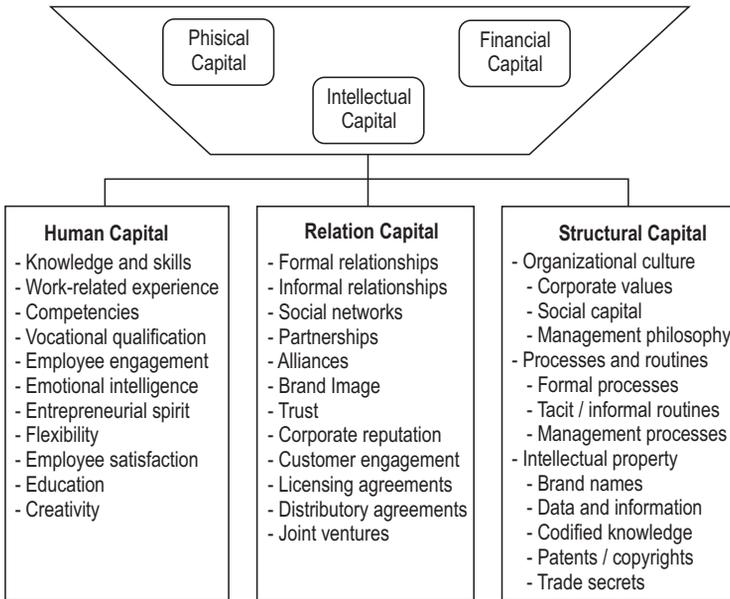
#### ***Human Capital***

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

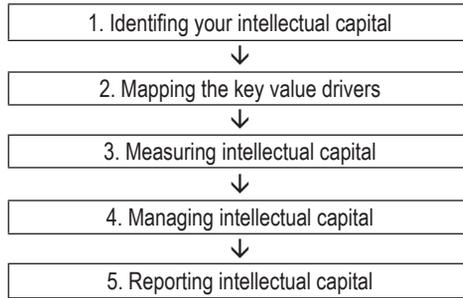
In this MAG, we will outline five key steps for successfully managing intellectual capital (see Figure 15). The first step is to identify an organization's intellectual capital. Once this is known, we need to assess its value. It is important to understand that not all intellectual capital is automatically 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

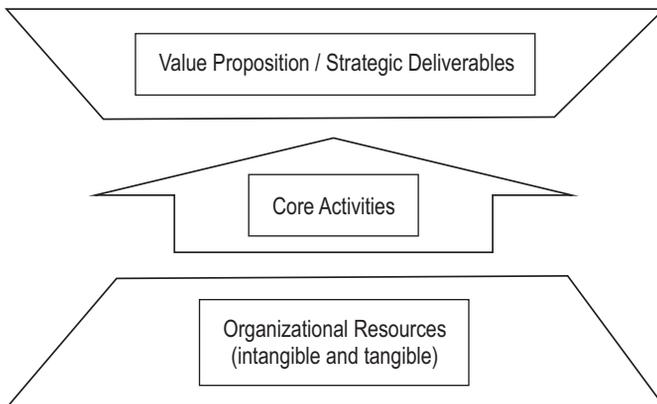
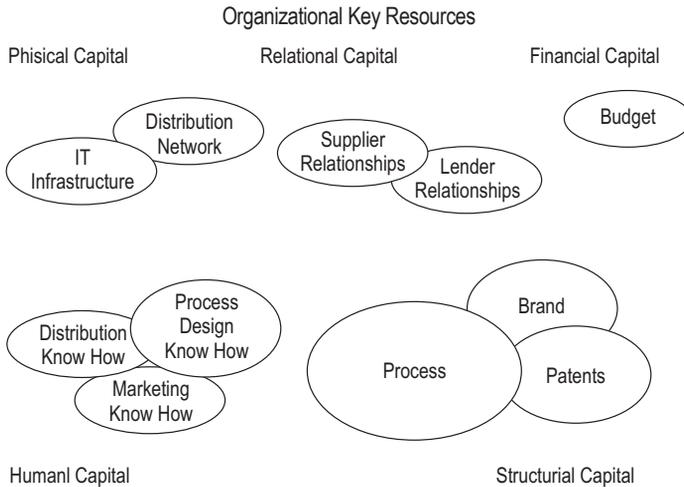


FIGURE B17: VISUALIZING THE RELATIVE IMPORTANCE OF KEY RESOURCES



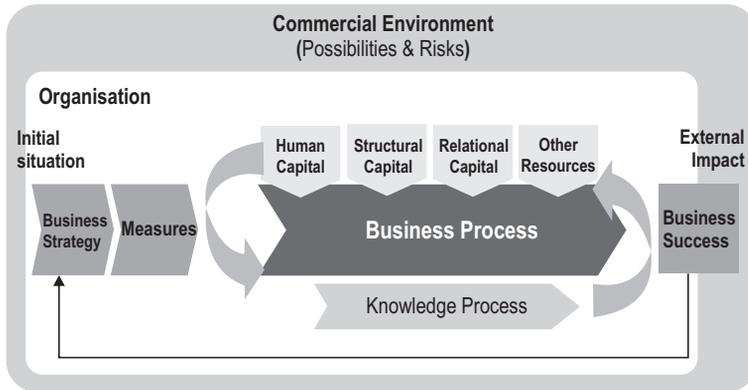
Source: Marr 2008.

#### **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.

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**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:

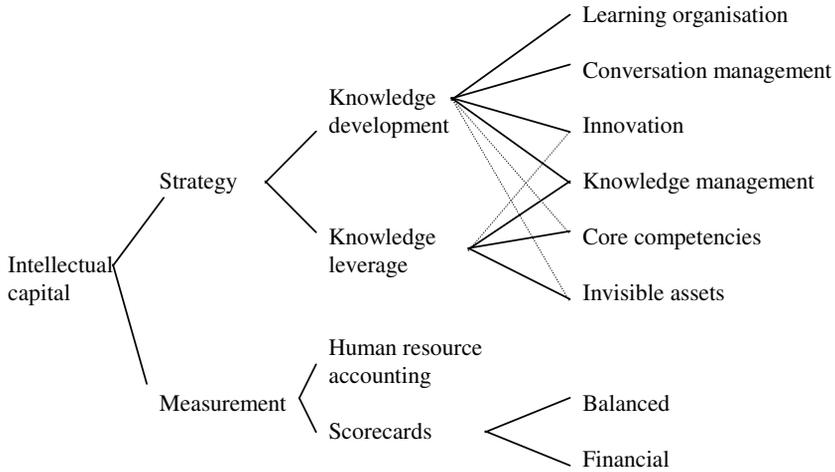
1) Defensive roles:

- 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

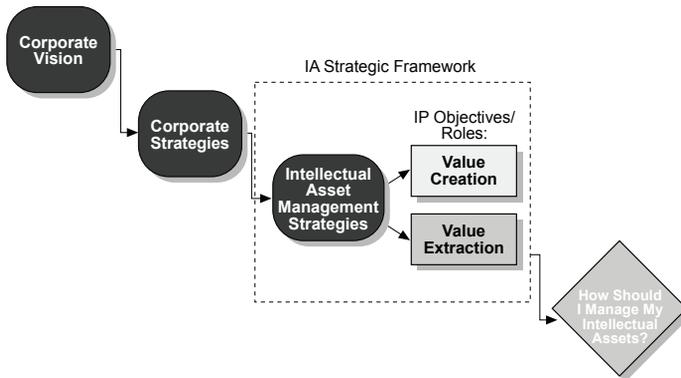


Source: Brennan, N. & Connell, B. 2000.

**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



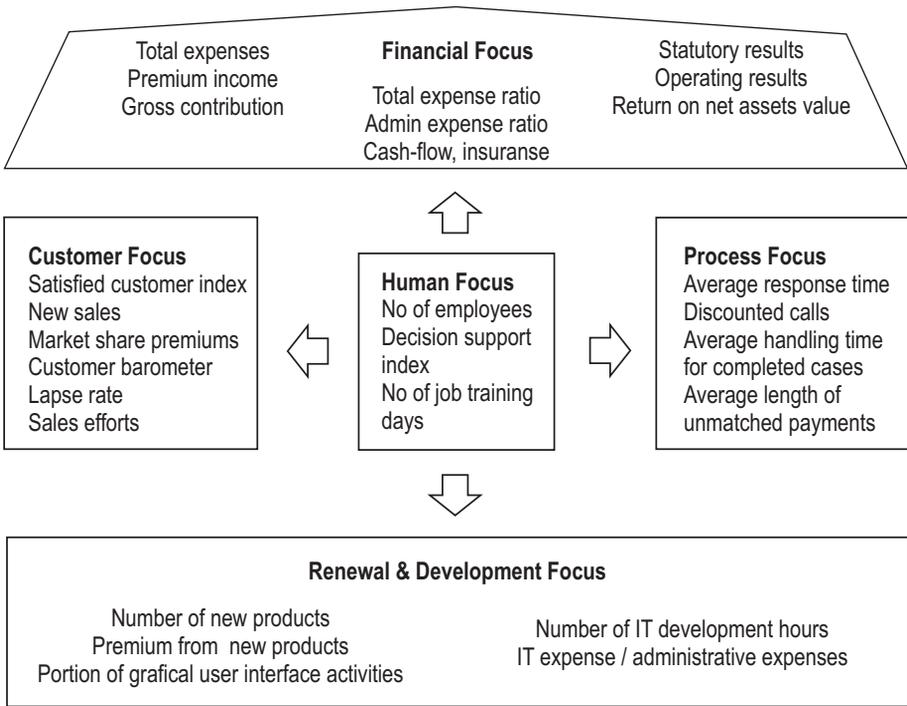
**Source:** Harrison & Sullivan 2000.

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).

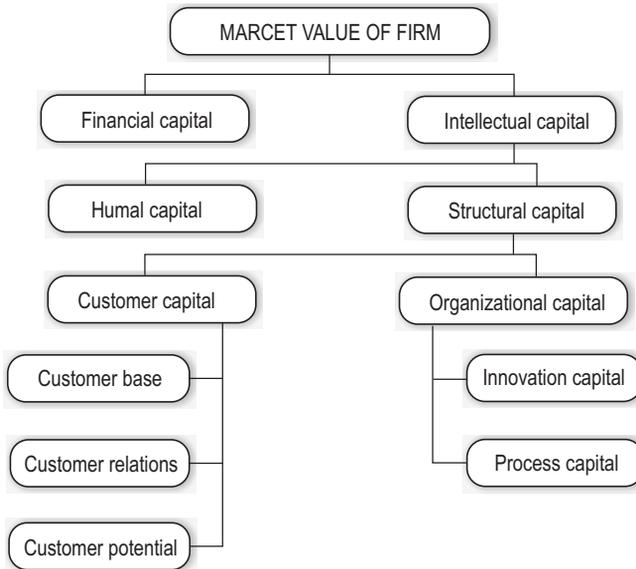
FIGURE 2.19: SKANDIA NAVIGATOR



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.

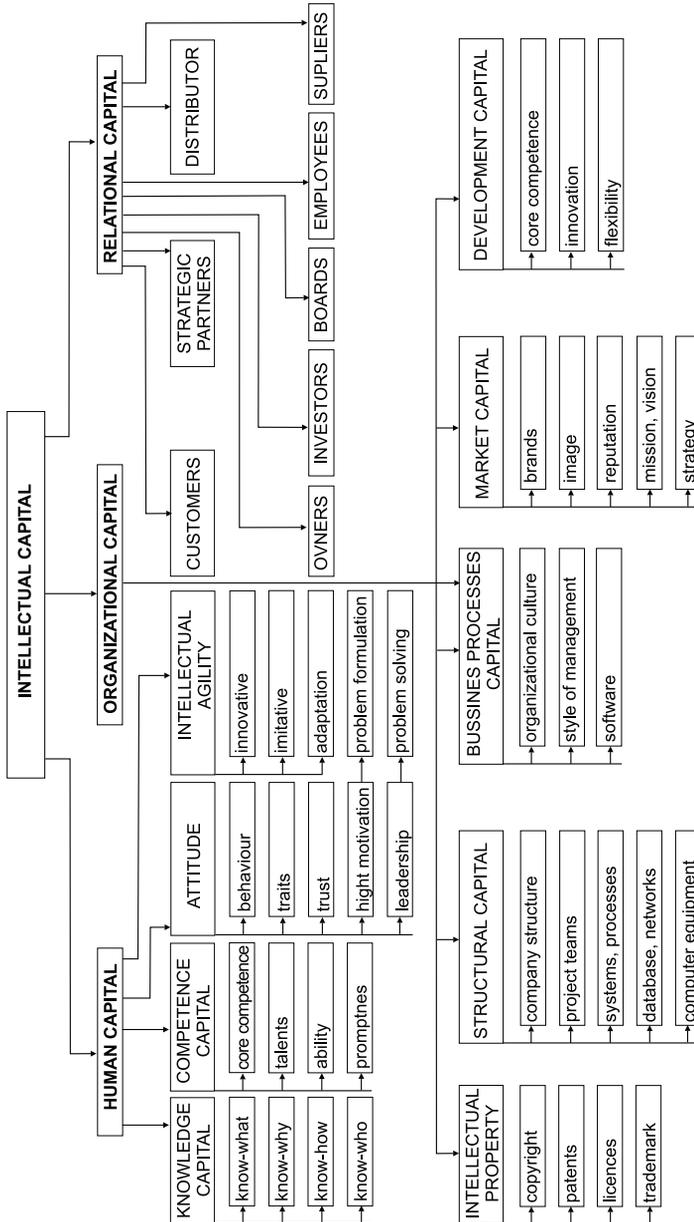
TABLE 2.8: DETAILED STRUCTURE OF I.K. FIRM

<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

Author	Structure of IC
E. Brooking	market assets, intellectual property, human assets and infrastructure assets
T. Stewart	human capital, organizational capital and client capital
P. Doyle	technological assets, strategic assets, reputational assets, human resources and organizational culture
J. Hope i T. Hope	<p>a) <b>external structures</b>: brands, consumer aspects (consumer confidence, sales and distribution channels) and contracts,</p> <p>b) <b>internal structure</b>: intellectual property (patents, copyrights, licenses, stamps), infrastructure (processes, models, communication systems, databases) and culture, and</p> <p>c) <b>skills</b>: 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).

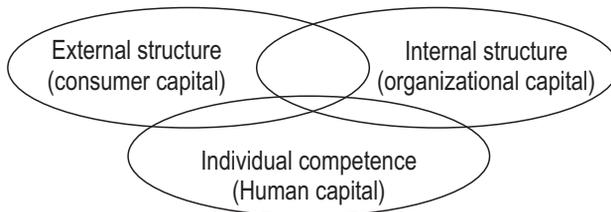
There are three types (“families”) of knowledge capital, between which boundaries are not precise, but conditional:

- *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 AMOGN 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 metaphore 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).

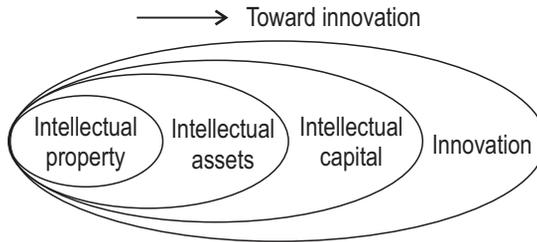
TABLE 2.10: CLASSIFICATION OF INTELLECTUAL CAPITAL

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

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 INTELLECTUAL CAPITAL, INTANGIBLE ASSETS AND INTELLECTUAL PROPERTY



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

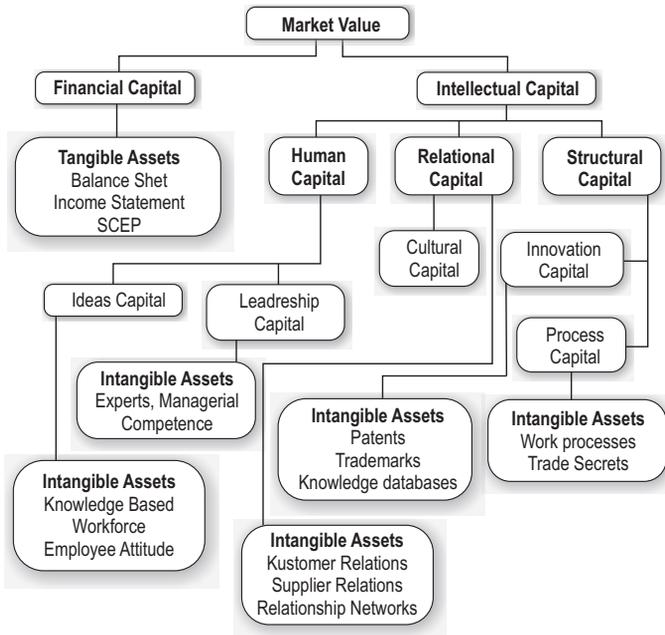
The research has shown that companies that develop their human capital have a much better financial results than those who do not. Economic agents are advised to identify demands for learning and training and to ensure that the manager work more as teachers and mentors to employees, developing with them 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.

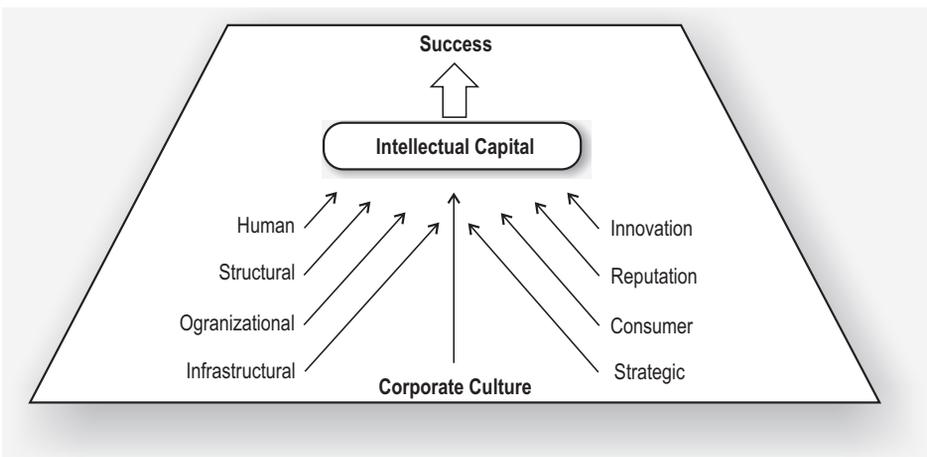
TABLE 2.11: TOBINS' COEFFICIENT FOR SELECTED MONTENEGRIN FIRMS

<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:

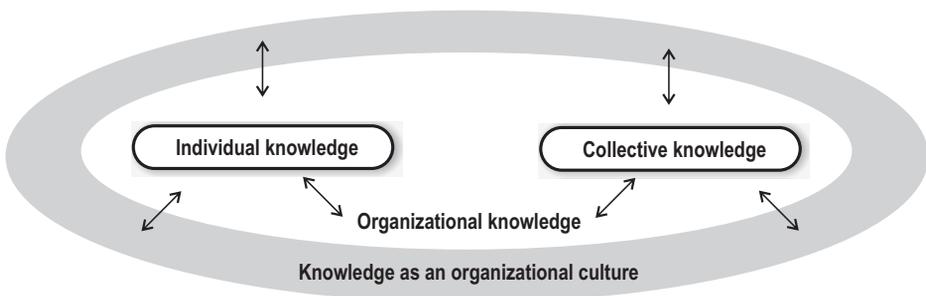
- *economic capital* (directly converted into money and institutionalized in the form of property rights),
- *cultural capital* (institutionalized through educational qualifications), and
- *social capital* (constituted through social “connections” and relationship with the environment).

TABLE 2.12: THE FLEXIBLE ENTERPRISE

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

## Part 3

# THE KNOWLEDGE MANAGEMENT

Knowledge in n.e. is the most valuable business resource. Therefore, managing knowledge is a key component of modern knowledge management. It is owned by people in much greater degree than being used in business systems and organizations. This is evidenced by statements L. Platt, the former CEO of Hewlett Packard: *“If HP knew then what HP knows today, it would be three times as profitable.”* (by Frappaolo, 2002, p. 2). Transition of developed and partly under-developed countries in the knowledge economy has resulted in increased awareness of knowledge as a key factor for national economy growth and development. Businesses today operate in an environment of strong competition and advanced logistics channels. Goods and services are estimated to be about 30 percent more than necessary.

In order to survive in such environment it is not affordable to be mediocre, but to strive towards business excellence, to know how to survive in the market, to constantly prepare quality plans, based on information and knowledge, and to make right and timely decisions. Decisions must be adaptable and flexible, faced with the changing dynamics of an overall business and competitive environment, and related to the market trends. Information is crucial for deciphering messages from the environment and more or less predicting the future.

Radical changes in the business environment demand a new concept of management in relation to current practice. The need for knowledge management through the use of various management tools and technologies is imposed, enabling the comprehensive, fast and efficient use of all available data and information, both inside and outside the company. For example, one concrete modern system, which allows a comprehensive and efficient use of information, is the concept of business intelligence (Business Information Management). It is believed that a typical modern organization analyzes only 10 percent of the collected data, while 20 percent of companies, the most, use more than 50 percent of the collected data.

Managing the business information allows the use of remaining data, its collecting and converting into usable information. Managing the knowledge,

through implementing various concepts (discussed below), and using modern business intelligence tools, are necessary to gain a competitive advantage and survival in the markets. Emphasis on the role of knowledge in recent years is the result of significant structural changes in the economy. Today, the highest added value of a product and/or service is created by knowledge, not embedded materials. The result is higher sales innovation, not raw material.

Creating intellectual potential and current management is a new competitive weapon of n.e., where knowledge is the main product. In such environment, knowledge becomes fundamental necessity of life. Global market is focused on demanding, creating and encouraging knowledge (not only in documents or knowledge bases, it is increasingly becoming a part of organizational processes and organizational culture). In doing so, the importance of knowledge is coming to the fore in business management. Therefore, the knowledge management is one of the most important business functions.

Knowledge exists in people and teams, making a total organizational knowledge and potential, that can be measured. It is an intellectual capital of the company, now contained in a total market value. In recent decades, companies and organizations have focused their primary interest on investing in information technology, focusing primarily on explicit knowledge, which is easier to collect, transfer and manage.

The ability of organization is to expand the level of experiential knowledge and to share it with employees. It is still not possible to fully manage the experiential knowledge, however, a part of it could be “captured” by individuals in the organization, using appropriate tools and techniques to identify and measure it in a way that becomes accessible to all employees. Through this process, a part of the experiential knowledge can be transformed into third type of knowledge in the organization - so-called *implicit knowledge*. This knowledge is specific to a particular company and can not be copied. It is an important element of the company’s competitive advantage.

For successful application of knowledge management in the organization it is essential to be familiar with the concept representing a series of interactions, crucial for the process of creating organizational knowledge innovation cycle. It is so-called *knowledge chain*, introduced by T. M. Koulopoulos, R. Spinello and T. Wayne in their book “*CorporateInstinct: Building a Knowing Enterprise for the 21st Century*” (1997). There are four elements useful for knowledge management: internal awareness, internal responsiveness, external awareness, and external responsiveness. Internal awareness is the ability of organization to quickly estimate the key competency and overall skills.

Internal responsiveness is the ability of organization to use its knowledge and key competencies by making them as quickly incorporated into new products and/or services offered to the customers and market. External awareness (awareness of the environment) is the ability of the organization to better estimate the status of its products or services on the market, to detect the market trends, customer needs and habits in timely manner, to recognize the dangers of new competitors activities, to take care of the institutional constraints and new regulations and to timely estimate the future market demands. External responsiveness is the ability of the organization to accommodate to market demands, faster and more efficiently than its competitors. This is essential for the survival and competitive advantage in the market.

## 1. CONCEPT OF KNOWLEDGE MANAGEMENT

**K**nowledge management in the organization is a systematic process of searching, identifying, generating, systematization, storing, using and sharing of information and knowledge, which employees can create, update and implement in order to gain competitive advantages. It is a combination of certain aspects of human, innovation, strategic, communication and project management, and use of information technology in managing the organization.

V. Makarov (2003, p. 450) believes that knowledge management is the key element of the knowledge economy. The best examples are artificial intelligence and semantic representation of knowledge through computer technology and information and communication technology. According to many authors, knowledge alone can not bring a competitive advantage to the organization, only good managing skills. Modern companies are oriented to the efficient organization of its business functions, which requires highly qualified personnel, extensive experience and contemporary knowledge.

Thus, at the end of the last century was created *knowledge management* (KM) as “a systematic formation, renewal and application of knowledge in order to maximize the efficiency of the company” (K. Wiig). His subject has been the sum of knowledge and experience of all employees in the company (organizational component, tacit *knowledge*) and formalized (documented, *explicit*) knowledge stored in databases (information and communication component).

The definition of knowledge within these disciplines includes information that exists in the organization, so employees could implement them in daily operations and business objectives.

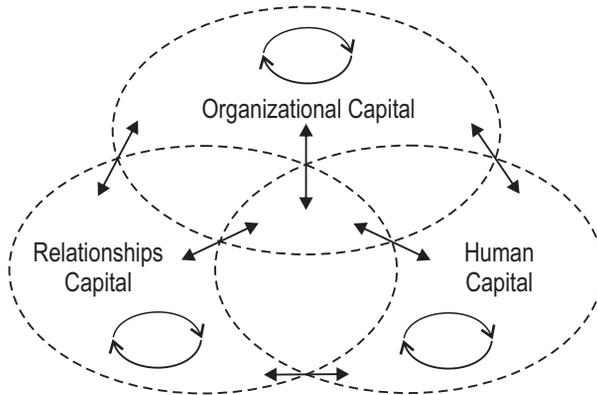
B. Masic (2004, p. 16) states that KM is a process through which the knowledge is created, learned, stored, shared and implemented. From the target point of view, it is an effective application of knowledge in all decision-making situations. The knowledge management strategy is based on mutual relations between the basic forms of IC (Gaponenko, Orlova, *Ibid*, p. 221).

Modern business organizations are increasingly based on intangible assets with ability to create competitive advantage and added value. Parallely with the development of paradigmatic knowledge economy, which emphasizes the role of knowledge in creating economic goods, grows the importance of knowledge management. Its application increases the chances of prospective development, and is based on human resources as generators of knowledge and information technologies as instrumental premises of storage, transfer and application of knowledge. There are several knowledge management strategies, focused on developing the basic forms of IC. *First* strategy is focused on the creation and use of knowledge in the human capital. It answers the questions: How to implement sharing knowledge among employees in the organization?, and How to increase their competency and use it in order to increase competitiveness? *Second* is focused on the creation and use of knowledge within the organizational capital, which refers to the organizational structures, information systems, databases, copyrights, patents, licenses, know-how, etc.

*Third* is focused on the creation and use of knowledge in the sphere of the external links, using marketing technology. *Fourth* is focused on the optimization of human capital and capital ratio (relationship with customers and suppliers, benchmarking, etc.). *Fifth* is focused on the optimization of human and organizational capital.

It answers the questions: How can individual skills of employees affect creating the elements of the organizational structure and how can enhance the effect of feedback of the organizational structure on employees? *Sixth* strategy is focused on optimizing the relationship between the capital and organizational capital. *Seventh* is focused on moving the knowledge at the same time (synergistic effects) between all forms of IC.

FIGURE 3.1: INTERACTION BASIC FORMS OF IC



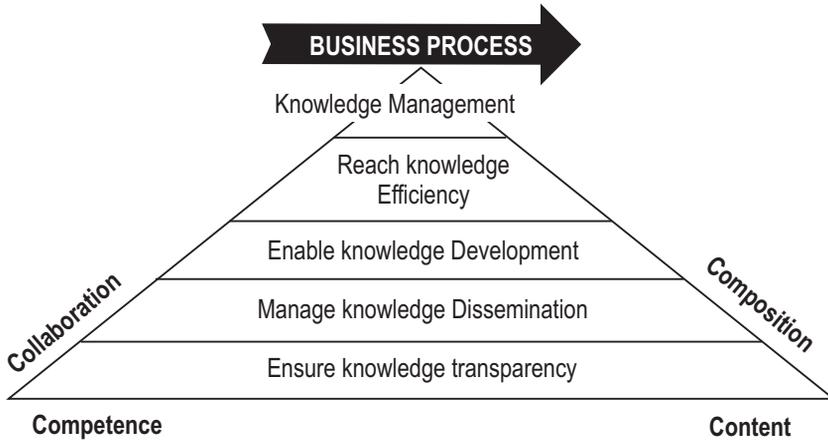
All developed countries are basing their development strategies on expanding IC as the main resource that can provide a competitive advantage in manufacturing. Knowledge as IC (conditionally) has become the main source of creating sustainable competitive advantages of organizations and meeting dynamically growing consumer demand. Benefits from knowledge management are constantly growing. Its influence is essential for creating competitive advantage, economic growth and development. There have been many models and theoretical directions that G. Marinko (2004) classified by technocratic, economic and behavioral approach, according to the criteria taken from M. Earl

In terms of globalization, economic competitiveness of the country depends on the level at which a society and economy are basing the creation of new and implementing the existing knowledge. Nations transfer their comparative advantages from resources to the abilities to implement the relevant knowledge in adopting and realizing important decisions. The transition to the knowledge society and knowledge economy assumes coordinated modernization of social systems, especially the political, economic, educational and cultural. Every delay leads to a halt in all sectors, because they are in direct relationship of mutual interdependence. From the perspective of the knowledge society, it is the dominant influence of the social environment on the education system and growth performance.

TABLE 3.1: VARIOUS SCHOOLS OF KNOWLEDGE MANAGEMENT

<i>School</i>	<i>Criteria</i>	<i>Basic Characteristics</i>
system	<i>technocratic</i>	longer existence; based on the tradition of systematic knowledge and expert systems; central idea is to gain knowledge and make it available to everyone who can use it.
carto-graphic	„	schools associated with the presentation of organizational knowledge based on the connection between knowledge and people, with the support of information technology.
process	„	this school is the result of re-engineering business processes, and is based on two basic ideas: a) business processes are stronger when operating personnel provided with knowledge required to perform the tasks, and b) management processes are initially more intense with knowledge of business processes; they are very important contextual knowledge and knowledge-based forms of practice.
commercial	<i>economic</i>	commercial protection foundation and the active use of knowledge in terms of goods and intellectual properties – patents, copyrights and trademarks.
organi-sation	<i>behavioral</i>	intensive use of society to activate the exchange and creation of knowledge, which are often multi-disciplinary and can be inter-organizational and intra-organizational; informal meetings and direct personal exchange of experiences are also used.
spatial	„	based on the use of space and spatial design in order to improve the exchange of knowledge: eg. open type office as a “building” of knowledge; mutual presence and socialization contribute to the exchange of knowledge and the creation of new knowledge
strategic	„	the knowledge management is seen as an indicator of competitive strategy, eg. some companies have declared their intellectual capital as a key competence

FIGURE 3.2: KNOWLEDGE MANAGEMENT GOAL PYRAMID



Source: Gerbert, H. et al. 2003, p. 116.

Figure 3.2 offers a way to directly realign a KM model to business processes, in this case the CRM process framework. The resulting CKM model focuses on the management of knowledge about, for and from customers, henceforth summarized by the term “customer knowledge”. Knowledge is created, located and captured, disseminated, modified and constantly used within all CRM business processes. Self-orientation of KM is the main reason that many KM models have difficulties proving the value of managing knowledge within a business environment.

However, the model shown on the Figure 3.2 does not require self-oriented knowledge management processes. It requires goals for managing the knowledge critical for its business processes. Therefore, this model transforms the KM process perspective of ontological KM models into a KM goal perspective.

The CKM goal perspective encompasses four goals:

a) *Knowledge transparency* supports the execution of business processes in defining their requirements concerning the manageability of customer knowledge.,

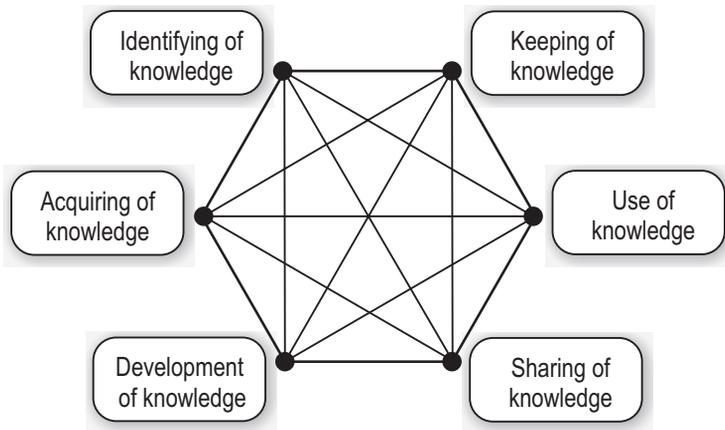
b) *Knowledge dissemination* supports the business process owners in defining the degree of customer knowledge distribution required among all the

individuals who participate in process activities. The management of dissemination requires the management of knowledge transparency,

c) *Knowledge development* supports the business process in defining the requirements concerning the adaptation and creation of knowledge. Although knowledge can be created by an individual, based solely on his or her own context, from a CRM process perspective valuable customer knowledge development requires the ability to disseminate knowledge among individuals. The management of knowledge development therefore requires the management of knowledge dissemination, and

d) *Knowledge efficiency* is based on the diminishing marginal utility of customer knowledge. The goal of knowledge efficiency supports the business process in selecting the knowledge crucial for the CRM process from the large body of knowledge available. Knowledge efficiency requires the manageability of knowledge development, because it necessitates a high level of understanding of current and future customer needs that is essential for enhancing the CRM processes. Since it requires a decision within an uncertain environment, one of the most difficult managerial decisions is to voluntarily destroy or disregard customer knowledge, based on the understanding that this knowledge will actually hinder the knowledge flows within a business process (Ibid.).

FIGURE 3.3: DIAMOND OF KNOWLEDGE



Source: Adapted from Krsmanovic 2004, p. 35.

The assimilation of knowledge (training system) is usually analyzed through the system of *knowledge management*, which can be of varying complexity, depending on the developmental level of business. Small enterprise generally resolves and/or performs specific tasks, so-called *managing tasks* and simple training system.

Medium enterprise (eg. joint-stock company) solves more (group) tasks, consisting of certain business processes (or more), so-called second level, ie. *management of business processes* with complex training system. The third level of business are investment and innovation projects, and appropriate system of training is *management by objectives and projects*. The largest companies form a specific set of values, a corporate and innovation culture and appropriate development philosophy, so the fourth level of the training system is *management by values*. Figure 3.3 schematically shows a combination of knowledge management activities, symbolically called the “diamond” of knowledge.

Accumulation, delivery and management of knowledge (and innovations, based on them) have become an imperative for economic growth and development. Knowledge and innovation, by their nature, content and target orientation, are complementary and interdisciplinary (the subject of many scientific disciplines). Considering the importance of scientific research for economic growth and development, foreign literature have analyzed number of models over the past 15 years, examining and explaining the above mentioned dependence and accumulation of knowledge (Romer 1990; Jones 1998 and others).

It is believed that the ability of an organization to change, to learn faster than others and to rapidly transform theory into practice, is the great advantage. “*The only competitive advantage is the ability to learn and change*” (M. Porter). Country, capital and equipment are no longer a decisive role in the market. Individuals, companies, and even nations, are increasingly dependent on the way in which they develop their skills and apply their knowledge in order to realize their goals. The goal of modern organizations is to view all business processes as knowledge processes. This includes the creating, gaining, storing, sharing and implementing the knowledge, which appears in all cycles of KM. In a rapidly changing and unpredictable environment, where companies seek to create and sustain a competitive advantage, the knowledge owned by organization becomes a decisive factor of the competition. Individual learning is not enough; it is necessary to develop a collective, organizational learning and knowledge. The collective, explicit knowledge and IC, ie. *intangible assets – property*, in the broadest sense, have become the best competitive weapons of our time.

In the era of digital technology, for the last three decades, Internet and Intranet environment have fundamentally changed the ways of doing business. While creating a business in a speed of thought and “*digital nervous system*”, B. Gates and C. Hemingway have noted that emerging hardware, software and communication standards were changing business and customer behavior. They have predicted that business would change in the next ten years, more than in the past half century. P. Drucker have noted that today’s business theories will not be valid in the next decade. According to him, business theory has three parts:

- assumptions on environment of the organization (society and its structure, market, consumers and technology),
- assumptions on specific mission of the organization, and
- assumptions on core competencies needed to achieve the organizational mission.

Due to a rapid changes, globalization and other complex phenomena, it is necessary to adjust these three assumptions to business theory and practice to a new reality - a new knowledge society. Analyzing information management, T. H. Davenport and L. Prusak gathered managers of 25 companies, among them Hewlett-Packard, IBM, AT & T and American Airlines. Managers were asked these questions: What do they need to know and what they did not know and how they can help them? Surprisingly, almost all of those successful managers have admitted that they do not really know how to manage enriched information and knowledge in their companies. Even the companies on high-tech level, managing to cope with the information revolution, admitted that they had no effective method and approach, that would enable the managing and understanding the information in a way that would improve their use.

In fact, those companies were striving to realize the essence. They were seeking the best practices, new ideas and creative cooperation, that information can not provide, no matter how well managed. This result is possible only by creating an effective use of knowledge. It is clear that most of the required knowledge already exists within their organizations, but it is not accessible at the time requested. Thus, he expressed his belief in the potential value of knowledge, with many executives in the organization.

Companies such as *Dow Chemical* and *Skandia* and consulting firms such as *Ernst&Young*, and *IBM Consulting* introduced positions “chief knowledge officers” and “director of intellectual capital” to study knowledge resources in their companies. They have pointed to the value of saving, improving and enlarging

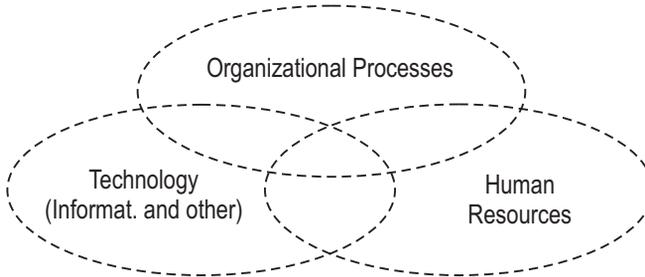
the productive business results, generated under the influence of KM. Reviewing the concepts that shape the theory and practice of management and that contribute creating the competitive advantages and core competencies of the twenty-first century is not easy, because they are numerous. Here are just some of the most important concepts, created in response to new management challenges:

- learning organization,
- core competence,
- knowledge management,
- total quality management,
- downsizing,
- outsourcing,
- business process reengineering,
- the strategy revolution,
- patching,
- enterprise resources planning,
- balanced score card, and
- e-commerce.

The concept of KM is developing the theory and practice of management. Prospects of further development are high. So-called “century of knowledge”, twenty-first century imposes unpredictable and complex competitive environment, where the survival and success of the organization depend solely on its ability to adapt to this dynamic business. Success factors, which will be decisive for the future of the company, are quality, innovation, and creativity. Companies differ among themselves according to their knowledge. Hence the importance of KM as a concept of collective knowledge, directed to the efficient use of knowledge for quick decision making. People will continue to play a central role in the development of the KM concept. Therefore, human resources need to be developed in order to achieve success.

KM is an interdisciplinary business concept, focused on organizational knowledge. It has roots in many disciplines, such as entrepreneurship, business, economics, organization, psychology, and management of information systems. Question of KM is an ultimatum, necessary for achieving competitive advantage. It also includes people, technology and organizational processes as interrelated and overlapping sectors.

FIGURE 3.4: HUMAN, ORGANIZATIONAL, AND TECHNOLOGICAL FACTORS OF KNOWLEDGE MANAGEMENT



Source: Masic & Djordjevic-Boljanovic 2005, p. 73.

There is no universal definition of KM, and no consensus on what it contains. Therefore, it is best to view KM in a larger context. In short, KM is a process through which organizations generate value of their intellectual assets based on knowledge. Generating usually means sharing knowledge among employees, departments and/or other companies, if that is in the best interest of the company. KM facilitates implementation of technology, but it is not a part of KM by itself. Every definition of KM contains several parts:

- the use of available knowledge from external sources,
- installation and storage of knowledge in business processes, products and services,
- storing knowledge in databases and documents,
- promoting the increase of knowledge through organizational culture and employees motivation,
- transfer and use of knowledge throughout the organization, and
- evaluation of benefits obtained by applying knowledge and its implantation into the organization.

Some benefits of KM are noticeable at first glance, but some are not. To receive as much benefits of KM as possible, knowledge must be available to everyone in the company, and its sharing must be the basis for cooperation. An effective KM program should help the company to accomplish some of the following:

- quickening innovation by encouraging the free flow of ideas,
- improving customer service,
- keeping the attention of employees through recognizing the values of their knowledge and appropriate rewarding,
- improving all activities and operations, and
- reducing the costs by eliminating unnecessary procedures.

KM is the adopting and using the collective knowledge and experience of the organization anywhere in the business process - on paper, documents, databases (*explicit knowledge*) or in the minds of employees (*tacit knowledge*). About 95% of information exists as tacit knowledge. It is a driving force for innovation - the only competitive advantage that keeps the company in an unpredictable business environment. The purpose of business is to use modern technology, which allows that knowledge is stored, distributed and spread across the organization and across the system to connect employees with documented knowledge.

The goal of modern organization is that all business processes are viewed as knowledge processes (creating, expanding, upgrading and implementing) across the organization. Creating the added value is done through the identification, application, and the use of knowledge. Organization and its managers should strive to create an explicit knowledge, which is collective by its nature. Every individual can always leave the organization, but knowledge can not disappear because it is contained in a databases and information. It amounts 10-20%, but with implementing the concept of KM it can be doubled.

Y. Malhotra (2000, p. 7) argues that *“KM includes the most important critical issues of organizational adaptation, survival and competence in ever-growing and rapidly changing business environment. Basically, KM embodies organizational processes focused on synergy and combining the data and information, increasing the capacity of information technology, creating and innovating potential human resources.”* This is the concept of collective knowledge in the organization, where ultimate goal is the effective application of knowledge in the situations where decisions are made. That knowledge should be available and able to be implemented. Furthermore, the concept of KM is, *“the ability to in relatively short time obtain an information, that will allow everyone in the organization to make the best decision, whether on market conditions, product, service, process, planned activities of competitors or other information important to the success of the company.”*

The need for unity is based on differences between “old” and “new” business world. Old business world is characterized by predictable environment, optimum efficiency, competence based on information and knowledge. New business world is characterized by a high unpredictability of the future. Information benefits, control system and the best practice are no longer sufficient for long-term competence of the organization. The new world is “*re-everything*” (reorganization of everything) and assumes overcoming the usual way of thinking and doing. The application of KM is a matter of survival in the new world of business competition, which differs from traditional methods of solving problems, focused on finding the right answers, but asking the right questions. What yesterday was a success, tomorrow can be a failure. The point is not in *doing the right thing* but in *doing the things right*, so the basis for competition would never be rigidity and incomppliance.

The KM process has three stages in its life cycle. According to P. Sydänmaanlakka (2002) KM process has five phases: *Creation, Capture, Storing, Sharing, and Application* of knowledge. Figure 3.5 shows connections between the life cycle of KM process and the four essential sectors of the organization.

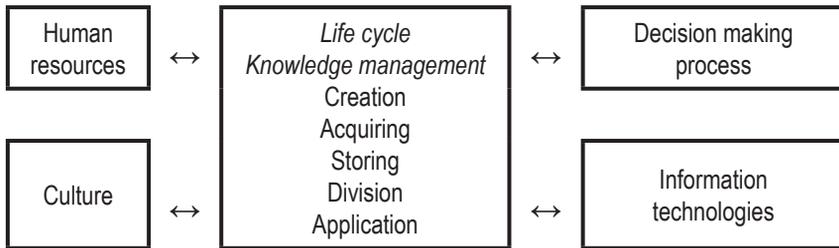
Each of these sectors can influence the way KM is installed and supported in the organization. E. M. Award and H. M. Ghaziri (2004) listed the main areas that need attention in the process of introducing the KM system.

*Culture.* Changing organizational culture is not a process that can be quickly implemented. The first challenge is to get people to share their knowledge instead of keeping it for themselves. In order to achieve this, it is necessary to change the attitudes and behavior of employees. Only the company that develops the right motivation for employees to collaborate and share their knowledge has a possibility to introduce a successful KM system. Traditionally, employees keep their knowledge for themselves, believing that with sharing they might lose their position in the organization. They think knowledge is the power which no one wants to lose. The KM system must make the knowledge sharing enough attractive so it could last.

*Knowledge estimation.* Estimating the value of information is a crucial step if the organization wants to revise its method or create a rewarding system for employees who create the “best” knowledge.

*Knowledge processing.* An effective KM system must provide high-quality collection, storage, processing and distribution of information.

FIGURE 3.5: LIFE CYCLE OF THE KNOWLEDGE MANAGEMENT AND ORGANIZATION



*Application of knowledge.* Technology has enabled the cooperation in the field of knowledge, regardless of the time and place. One of the important tasks of KM is to extract the meaning from information, which will have an impact on the application of knowledge in solving a specific problem. Modern companies demand quality, value, innovation and speed as the key factors for achieving success in the future. They will differentiate among themselves according to the level of knowledge. Definition of the company *Sidney Winters*: “*Organization that knows how to do things*” will probably change to: “*Organization that knows how to do new things quickly and well.*”

*American Productivity and Quality Center (APQC)* has identified the main barriers for knowledge sharing. In their book, *If we only knew what we know*, authors C. J. Grayson, CEO and president of APQC, and C. O’Dell, have pointed out four reasons for improper knowledge sharing: *Ignoring*. A person who has knowledge does not realize that someone else can find it (knowledge) useful. On the other hand, someone who can benefit from knowledge may not know that someone else in the company already owns it. *Lack of absorbing capacity*. Employees often waste time, money and resources looking for the information they need. *Lack of communication among staff*, and *Lack of motivation*. People do not see a clear business reason to strive to knowledge transfer.

The main factors explaining the need for studying and integrating KM in modern business are as follows: markets are increasingly competitive and the rate of creating innovation is increasing, the reduction of staff produces a need to replace informal knowledge with formal, competitive pressure reduces the work force, which holds a valuable business knowledge, time devoted to gaining experience and knowledge is limited, retirement and increase of labor mobility lead to the loss of knowledge, change in strategy may result in losing knowledge in a particular sector, most of working positions are based on information,

organizations are competing on the basis of knowledge, products and services are more complex, containing important informational component and need for permanent learning is an inevitable reality.

The best way to overcome human barriers is integration of KM in organizational hierarchy. KM principles must be integrated in order to achieve optimum results. Today, organizations are investing millions of dollars in technology that should allow a better flow of information. However, deeply stored knowledge that exists within the organization remains unused. Sharing knowledge in the right way and looking for new ways that involve breaking down barriers and integration of KM in organizational structure should allow better business. This disconnection between the costs of information technology and organizational operations is a result of transition from the era of competitive advantage based on *the information* and era based on *the knowledge creation*.

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### **Box 17 - Multidisciplinary Nature of KM**

Knowledge management draws upon a vast number of diverse fields such as:

- Organizational science
- Cognitive science
- Linguistics and computational linguistics
- Information technologies such as knowledge-based systems, document and information management, electronic performance support systems, and database technologies
- Information and library science
- Technical writing and journalism
- Anthropology and sociology
- Education and training
- Storytelling and communication studies
- Collaborative technologies such as Computer-Supporte
- Collaborative Work (CSCW) and groupware as well as intranets, extranets, portals, and other web technologies

The above is by no means an exhaustive list but serves to show the extremely varied roots that KM grew out of and continues to be based upon today. Figure B21 illustrates some of the diverse disciplines that have contributed to KM. The multidisciplinary nature of KM represents a double-edged sword: on the one hand, it is an advantage as almost anyone can find a familiar foundation upon which to base an understanding and even practice of KM. Someone with a background in journalism, for example, can quickly adapt this skill set to capture knowledge from experts and reformulate this knowledge as organizational stories to be stored in corporate memory.

Someone coming from a more technical database background can easily extrapolate his or her skill set to design and implement knowledge repositories that will serve as the corporate memory for that organization. However, the diversity of KM also results in some challenges with respect to boundaries. Skeptics argue that KM is not and cannot be said to be a separate discipline with a *unique* body of knowledge to draw upon. This attitude is typically represented by statements such as “KM is just IM ” or “ KM is nonsensical — it is just good business practices. ” It becomes very important to be able to list and describe what attributes are necessary and in themselves sufficient to constitute knowledge management both as a discipline and as a field of practice that can be distinguished from others.

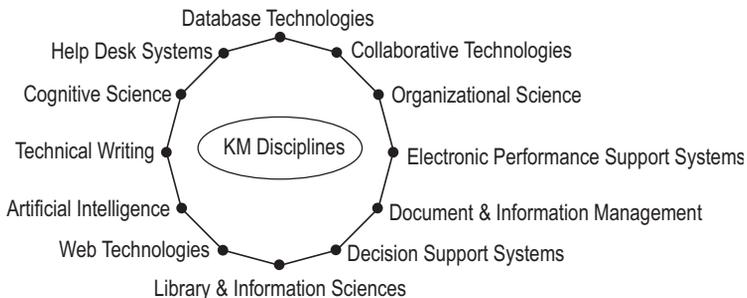
One of the major attributes lies in the fact that KM deals with knowledge as well as information. Knowledge is a more subjective way of knowing, typically based on experiential or individual values, perceptions, and experience. Consider the example of planning for an evening movie to distinguish between data, information, and knowledge.

*Data* Content that is directly observable or verifiable: a fact; for example, movie listings giving the times and locations of all movies being shown today — I download the listings.

*Information* Content that represents analyzed data; for example, I can't leave before 5, so I will go to the 7 pm show at the cinema near my office.

*Knowledge* At that time of day, it will be impossible to find parking. I remember the last time I took the car, I was so frustrated and stressed because I thought I would miss the opening credits. I'll therefore take the commuter train. But first, I'll check with AI. I usually love all the movies he hates, so I want to make sure it's worth seeing! Another distinguishing characteristic of KM, as opposed to other information management fields, is the fact that knowledge in all of its forms is addressed: tacit knowledge and explicit knowledge.

## B21: INTERDISCIPLINARY NATURE OF KNOWLEDGE MANAGEMENT



Ruggles and Holtshouse (1999) identified the following key attributes of knowledge management::

- Generating new knowledge
- Accessing valuable knowledge from outside sources

- Using accessible knowledge in decision making
- Embedding knowledge in processes, products and/or services
- Representing knowledge in documents, databases, and software
- Facilitating knowledge growth through culture and incentives
- Transferring existing knowledge into other parts of the organization
- Measuring the value of knowledge assets and/or impact of knowledge management.

### History of Knowledge Management

Although the term *knowledge management* formally entered popular usage in the late 1980s (e.g., conferences in KM began appearing, books on KM were published, and the term began to be seen in business journals), philosophers, teachers, and writers have been making use of many of the same techniques for decades. Denning (2002) related how from “time immemorial, the elder, the traditional healer, and the midwife have been the living repositories of distilled experience in the life of the community” ([http://www.stevedenning.com/knowledge\\_management.html](http://www.stevedenning.com/knowledge_management.html)).

Some form of narrative repository has been around for a long time, and people have found a variety of ways to share knowledge in order to build on earlier experience, eliminate costly redundancies, and avoid making at least the same mistakes again. For example, knowledge sharing often took the form of town meetings, workshops, seminars, and mentoring sessions. The primary vehicle for knowledge transfer was people themselves - in fact, much of our cultural legacy stems from the migration of different peoples across continents. Wells (1938), while never using the actual term *knowledge management*, described his vision of the *World Brain* that would allow the intellectual organization of the sum total of our collective knowledge. The World Brain would represent “a universal organization and clarification of knowledge and ideas” (Wells 1938, xvi). Wells in fact anticipated the World Wide Web, albeit in an idealized manner, when he spoke of “this wide gap between... at present unassembled and unexploited best thought and knowledge in the world... we live in a world of unused and misapplied knowledge and skill” (p. 10). The World Brain encapsulates many of the desirable features of the intellectual capital approach to KM: selected, well-organized, and widely vetted content that is maintained, kept up to date, and, above all, put to use to generate value to users, the users’ community, and their organization.

What Wells envisioned for the entire world can easily be applied within an organization in the form of an intranet. What is new and termed *knowledge management* is that we are now able to simulate rich, interactive, face-to-face knowledge encounters virtually through the use of new communication technologies. Information technologies such as an intranet and the Internet enable us to knit together the intellectual assets of an organization and organize and manage this content through the lenses of common interest, common language, and conscious cooperation. We are able to extend the depth and breadth or reach of knowledge capture, sharing and dissemination activities, as we had not been able to do before and find ourselves one step closer to Wells’ (1938) “perpetual digest ... and a system of publication and distribution” (pp. 70 – 71) “to an intellectual unification... of human memory” (pp. 86 – 87).

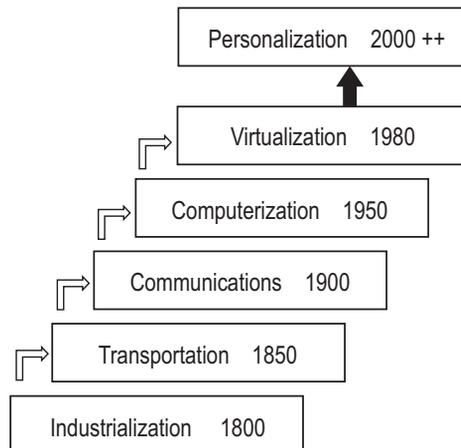
Drucker was the first to coin the term *knowledge worker* in the early 1960s (Drucker 1964). Senge (1990) focused on the *learning organization* as one that can learn from past experiences stored in corporate memory systems. Dorothy Barton-Leonard (1995) documented the case of

Chapparral Steel as a knowledge management success story. Nonaka and Takeuchi (1995) studied how knowledge is produced, used, and diffused within organizations and how this contributes to the diffusion of innovation.

The growing importance of organizational knowledge as a competitive asset was recognized by a number of people who saw the value in being able to measure intellectual assets (see Kaplan and Norton; APQC 1996 ; Edvinsson and Malone 1997, among others). A cross-industry benchmarking study was led by APQC' s president Carla O' Dell and completed in 1996. It focused on the following KM needs:

- Knowledge management as a business strategy
- Transfer of knowledge and best practices
- Customer-focused knowledge
- Personal responsibility for knowledge
- Intellectual asset management
- Innovation and knowledge creation ( APQC 1996 )

FIGURE B22: DEVELOPMENTAL PHASES IN KM HISTORY



The various eras we have lived through offer another perspective on the history of KM. Starting with the industrial era in the 1800s, we focused on transportation technologies in 1850, communications in 1900, computerization beginning in the 1950s, and virtualization in the early 1980s, and early efforts at personalization and profiling technologies beginning in the year 2000 (Deloitte, Touche, Tohmatsu 1999). Figure B22 summarizes these developmental phases. With the advent of the information or computer age, KM has come to mean the systematic, deliberate leveraging of knowledge assets. Technologies enable valuable knowledge to be *remembered*, via organizational

learning and corporate memory; as well as enabling valuable knowledge to be *published* that is, widely disseminated to all stakeholders. The evolution of knowledge management has occurred in parallel with a shift from a retail model based on a catalog (e.g., Ford's famous quote that you can have a car in any color you like - as long as it is black) to an auction model (as exemplified by eBay) to a personalization model where real-time matching of user needs and services occur in a win-win exchange model.

In 1969, the launch of the ARPANET allowed scientists and researchers to communicate more easily with one another in addition to being able to exchange large data sets they were working on. They came up with a network protocol or language that would allow disparate computers and operating systems to network together across communication lines. Next, a messaging system was added to this data file transfer network. In 1991, the nodes were transferred to the Internet and World Wide Web. At the end of 1969, only four computers and about a dozen workers were connected. In parallel, there were many key developments in information technologies devoted to knowledge-based systems: expert systems that aimed at capturing *experts on a diskette*, intelligent tutoring systems aimed at capturing *teachers on a diskette* and artificial intelligence approaches that gave rise to knowledge engineering, someone tasked with acquiring knowledge from subject matter experts, conceptually modeling this content, and then translating it into machine-executable code (McGraw and Harrison-Briggs 1989). They describe knowledge engineering as "involving information gathering, domain familiarization, analysis and design efforts. In addition, accumulated knowledge must be translated into code, tested and refined" (McGraw and Harrison Briggs, 5). A knowledge engineer is "the individual responsible for structuring and/or constructing an expert system". The design and development of such knowledge-based systems have much to offer knowledge management that also aims at the capture, validation, and subsequent technology-mediated dissemination of valuable knowledge from experts.

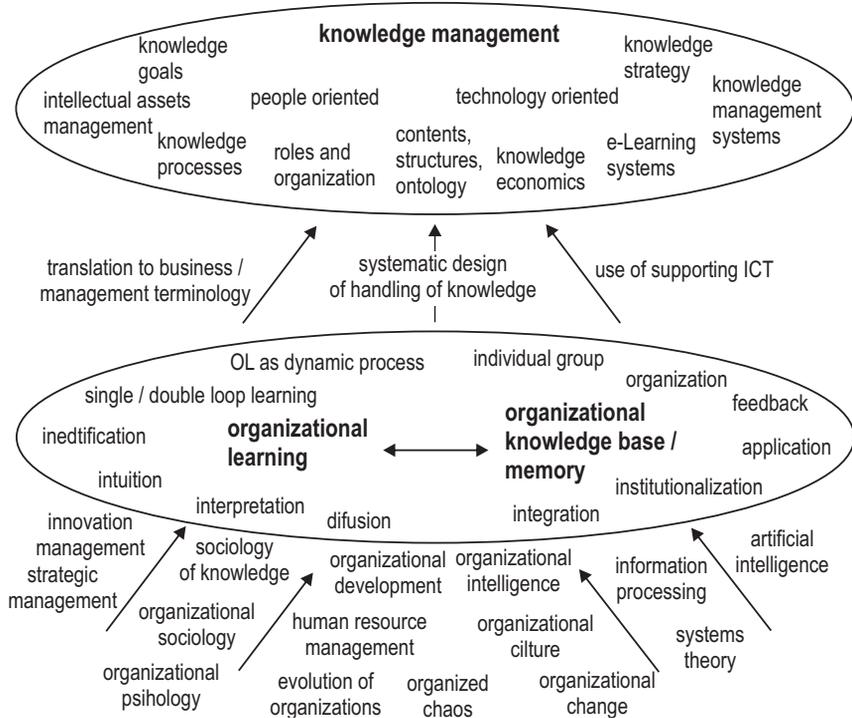
By the early 1990s, books on knowledge management began to appear and the field picked up momentum in the mid 1990s with a number of large international KM conferences and consortia being developed. In 1999, Boisot summarized some of these milestones. At the 24th World Congress on Intellectual Capital Management in January 2003, a number of KM gurus united in sending out a request to academia to pick up the KM torch. Among those attending the conference were Karl Sveiby, Leif Edvinsson, Debra Amidon, Hubert Saint-Onge, and Verna Allee. They made a strong case that KM had up until now been led by practitioners who were problem-solving by the seat of their pants and that it was now time to focus on transforming KM into an academic discipline, promoting doctoral research in the discipline, and providing a more formalized training for future practitioners. Today, over a hundred universities around the world offer courses in KM, and quite a few business and library schools offer degree programs in KM ( Petrides and Nodine 2003).

Source: [http://mitpress.mit.edu/sites/default/files/titles/content/9780262015080\\_sch\\_0001.pdf](http://mitpress.mit.edu/sites/default/files/titles/content/9780262015080_sch_0001.pdf)

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Box 18 - Individuation

FIGURE B23: INDIVIDUATION



Source: Maier 2007.

## 2. MODELS OF KNOWLEDGE MANAGEMENT

Science intensity of industries and the resulting increase in the share of intangible assets in the capitalization of the company is characteristic of the modern economy, ie. the “knowledge economy”. Information and knowledge in theory and practice are treated as *immediately productive force* and a strategic factor of production. If we ignore questionable hypothesis underlying the

mathematical modeling of the knowledge impact on economic growth and development, applied mathematical and statistical instrumentation and alternation of obtained scenarios (results), there are two important general conclusions: Investments in the knowledge economy sectors are more profitable than other investments; and Positive impact of investments in the n.e. sectors on GDP, in the long term, is greater than the corresponding impact of investment in other sectors. Lately, much has been written about n.e., which is based on knowledge, information and services, dominated by:

- high-tech industries, with low material and labor intensity and high cost of scientific research in the added value, and
- industries of so-called “soft” technologies, dealing with the elaboration of software support, system integration, etc. As these are sectors with high risks and long periods of return on investment, private capital usually avoids them in many states (the most of post-socialist countries) because it strives towards more profitable investments in business and industries of raw material, construction, retail and other. Therefore, in the considered area of innovation often requires an active role of the institute of state regulation. Simplified and most general model of knowledge can look like following.

B. Kogut and U. Zander (1992) were the first to establish the theory of knowledge management, which underlines the strategic importance of knowledge as a source of competitive advantage. Their work is based on the idea that *“company will benefit more from creating and transferring the knowledge within the organization, than from the market.”* Knowledge consists of information and know-how, individually or together. Companies act as “skill storage”, defined with social knowledge, obtained through individuals who are connected through organizational principles. They observed that: a) companies are more efficient if they rely on the knowledge, b) the common understanding develops by individuals and groups within the company through interaction of knowledge transfer from the concept to production and markets, c) company has to rely on knowledge to overcome shortcomings of the market, and d) limits of the company are defined by knowledge, not by shortcomings of the market.

Recent work of M. Earl represent a set of heuristics, generated by the model of *Chief Knowledge Officer*. It is about the function of knowledge within the organization, which regulate the activities of knowledge. He distinguishes data, information and knowledge, and lists three categories of knowledge: received (*accepted*) - science (*data*), acheaved (*workable*) - conclusion, opinion (*information*) and potential (*potential*) - experience (knowledge), which is, according to

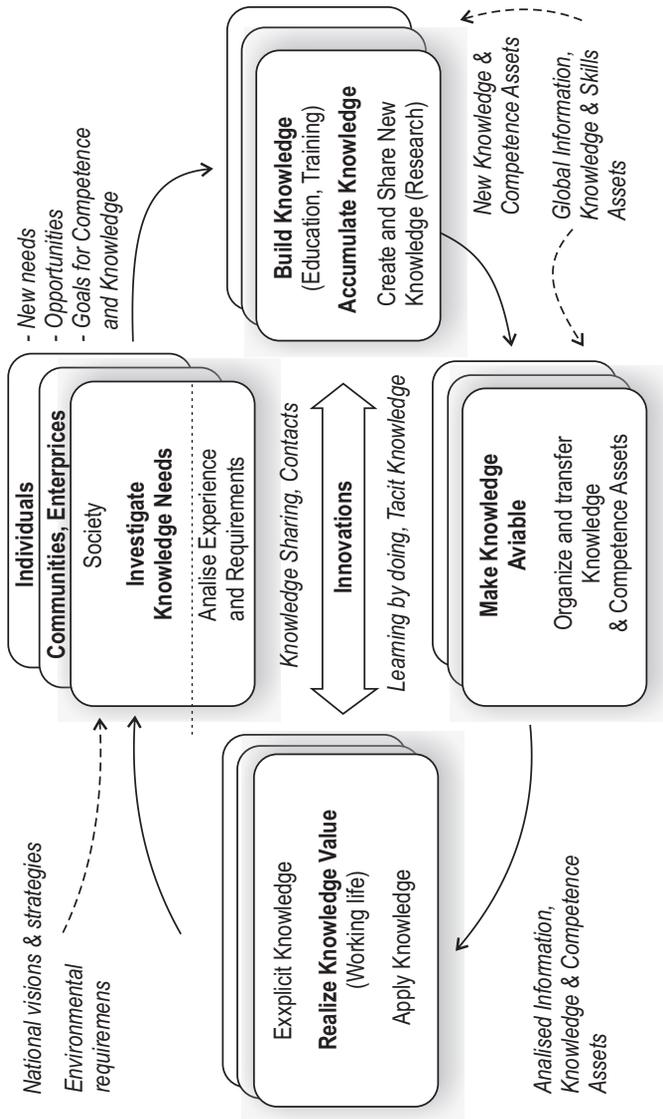
him, the most valuable, because it has the greatest applicability. M. Earl (1998, p. 7) points out that “*this banal classification with flaws indicates that knowledge consists of expertise, experience, know-how, skills and competence*”. Further, he identifies two organizational conditions, important for knowledge management: knowing and knowledge. He believes that the organization should care for creation, protection and encouragement of its knowledge assets using four functions: *inventory* - mapping of individual and organizational knowledge, *revision* - estimating the character and scope of ignorance and knowledge development through cognitive activities, *socialization* - initiating events that creating the possibility to share the informal, experiential knowledge, and *review* - pointing to the problem of ignorance by learning from the experience, through activities and overcoming unusual situation. On those grounds Earl forms his own knowledge management model, which consists of four technical and social components: knowledge systems, networks, workers of knowledge and training organizations (according Barantsev 2007, p. 119).

*Model by E. Carayannis* is based on *Organizational Knowledge Network* and *Organizational Cognition Spiral*. He (1999, p. 219) proposes a “*synergistic symbiosis of information technology, management and organizational learning*”, all linked by knowledge management. Information technology is accessed by adding the value of technological infrastructure to management/organizational knowledge as “*the capacity for individual and mutual acting, learning, expressing emotions and predicting,*” to the knowledge management as a “*socio-technical system of tacit and explicit business policy and practice*”. Carayannis was trying to define the systems and structures, real and virtual, which would allow an organization to achieve maximum efficiency and effectiveness of its cognitive processes. Crystallized form of this intent includes the term *Organizational Knowledge Net*. Based on three key elements (meta-cognition, meta-training and meta-knowledge) and matrix (2x2) “consisting of successive knowledge circulation, where individuals and/or organizations overcome four levels of understanding and ignorance,” he (Ibid., p. 224) has formulated a model, explaining the situations listed in quadrant matrix (ignorance of ignorance, ignorance of the understanding, comprehension of ignorance and understanding the understanding). Thereby, the actions are focused on transition from one state to another, which is accomplished in two ways: the ability of interaction and concerted actions, supported by information technology. Properly directed actions lead not only to the spiral (expanding) knowledge, but also to increased knowledge of training methods. He argues that the link between *knowledge* and *meta-knowledge* is essential for management knowledge, which is a famous issue in the community of organized learning.

*Model by Viig* (knowledge-technology-business-management) is based on four assumptions (based on three pillars) for directing the knowledge management, namely: the foundation of the knowledge management are answers to the question of who produces the knowledge, how is it used in problem-solving and decision-making, and how knowledge is expressed in the cultures, technologies, and procedures; pillar of the continuous knowledge research; pillar of the knowledge assessment in an business prior, during and at the end of the process; and a pillar of active knowledge management throughout the life cycle of the organization, in all phases of the life cycle of goods and innovation (Ibid., s.120). Societal knowledge management in the Industrial Age was very institution oriented - focused education, research, administrative, and corporate institutions. In the Industrial Age societal knowledge management consisted only two main operations: those who construct and create knowledge (education and research), and those who apply and exploit knowledge (mainly working life). We need new solutions. One solution is to use an analogy taken from the concepts of organizational knowledge management. In the Knowledge Age we need more operations involving investigation of knowledge needs and making knowledge easily available.

In a knowledge-based society, the requirements for working skills and knowledge change very fast. We need new ways to investigate environmental requirements and experiences and from that basis focus and direct resources, and establish the main goals of public education and research in order to balance better the demand and supply for skills and knowledge. This calls for new ways of communication and knowledge intensive cooperation between working world and the public sector. We need educational reform. The operation mode, content, methods, role of teacher, learning/teaching environments of the whole education chain have to be developed to respond more flexibly and proactively to the needs of knowledge economy. This means a new way of networking among educational institutions as well as with working life. The key knowledge accumulation experience is learning by doing in everyday tasks, in human networks. In the Knowledge Age globalization and virtual communities change the way for creating new knowledge. A big part of created knowledge is tacit, and therefore not easily transferable to colleagues, new employees and students without face-to-face communication or more systematic knowledge sharing. Today, we are faced with information overload and the difficulty of quickly finding needed, meaningful information and knowledge. The Internet and intranets serve a common environment for information and knowledge access, sources and services. But, search engines which we use have a lot challenges. There is a need to find methods to better navigate in information networks.

FIGURE 3.6: MODEL FOR KNOWLEDGE & COMPETENCE MANAGEMENT



Source: Kautto-Koivula (1998), adapted from K. Wiig 1995.

This could be done by analyzing, organizing and mapping existing information and knowledge assets and by producing meta-level information, information about information, taxonomies. The ongoing development around semantic web is a good example of the right step to this direction. How to apply and exploit new knowledge globally? There are national research centers. Challenges are how small and medium size enterprises and institutional research centers can be supported in developing their operation mode and skills to adopt the new working methods of the Knowledge Age. This requires the globalization of national and regional research centers, support for establishing new value chains and motivation for organizational and individual innovations. In addition to technical innovations, social innovations will become important in the future.

*Model by Edvinsson* is based on the company scheme, that values the knowledge assets. According to him, there are four components of IC whose interaction creates new value: *Human capital* with its knowledge and habits, which can be converted into value, where the knowledge is in the people, organizational routines and procedures; *Structural capital* as supporting infrastructure of the company. It is defined as physical structures (buildings, computers, etc..) and intangible or nonmaterial infrastructure (history, culture, management); *Business assets*, used by the company in commercial processes (the means of production, distribution networks); and *Intellectual property* of the company, which is protected by law. According to Edvinsson, dynamic aspect of this model is related to creating the value with two key sources. The *first* are innovations, which human resources transform into legally protected intellectual assets, and the *second* are products and services, resulting from the commercialization of innovation.

Model by Nonaka (model of four phases: socialization, externalization, combination and internalization - SECI), consists of the following elements: *First*, two types of knowledge:

a) *informalized* (closed: subjective thinking, ideals, shared values, emotions, premonition, personal beliefs, views and opinions, intellectual models, expressed beliefs, approaches to solving problems, skills, technological habits, competencies), and

b) *formalized* (open, public: expressed in words and numbers, simply arranged in a form of balance, descriptive models, mathematical and other formulas, projects, algorithmic processes, business plans, technical documentation, methods, textbooks, lectures, instructions, standards, laws, hypotheses and concepts);

*Second*, interactive dynamics, ie. knowledge transfer of the mutual actions - handing knowledge from stage to stage, from cycle to cycle; *Third*, three levels of social aggregation: individual, group and context; *Fourth*, four phases of knowledge construction (SECI); *Fifth*, conditions for knowledge construction; and *Sixth*, structure of organization, focused on knowledge.

In addition to these elements, considered model explains following: intellectual approaches and systems thinking in organizations with learning concept by Senge, a knowledge that is produced and used in the dynamic modeling of the business concept by Jansen, a knowledge that is required for the development of models to make a profit and business model innovation, a knowledge needed to manage intellectual capital according to the concept of E. Brooking, and A. Zinoviev, a knowledge that is produced and used in the creative process of solving problems according to the concept of G. Altshuller, and in the process of training according to the concept of G. Dryden, and J. Voss, and knowledge and intellectual productivity according to the concept of P. Drucker.

This model allows analyzing following issues: increase of human resources value, intellectual property rights, competitiveness of business, productivity, mental labor, support of management solutions in the strategic management of innovation and so on. He suggests that a company that creates knowledge consciously facilitate interaction between the tacit and open knowledge ie. four processes of knowledge creation. This is achieved by using the systems, structures and corporate culture that facilitates interaction. In addition: *socialization* is a division of tacit knowledge between individuals through joint activities and physical proximity; *externalization* is expressing the hidden knowledge in publicly comprehensible form; *combination* is the conversion of explicit knowledge into its complex forms: communication, distribution and systematization, and *internalization* is the conversion of externalized knowledge into tacit knowledge at the individual or organizational level, ie. embodiment of the explicit knowledge through actions, practices, processes and strategic initiatives. According to Nonaka, dynamics of interaction between knowledge forms and organizational levels is essential. The key of creation is a spiral that results exchanging formalized and informalized knowledge through various organizational levels, and re-creating the knowledge at the same time. Companies should recognize the importance of the dynamic interaction between knowledge and incorporate mechanisms, enabling interaction between different kinds of knowledge.

*Model by Demarest* emphasizes the construction of knowledge within organization. This construction is not limited on scientific inputs only, but also includes social construction of knowledge. Thus, constructed knowledge within

organization is product of explicit education programs and social exchange (McAdam and McCready, 1999). It is also a process of expanding knowledge throughout the organization and its environment. Knowledge is seen as an economic resource. This model is attractive because it does not assume any definition of knowledge, but strives to holistic approach. According to R. Frid's (2003) methodology of knowledge management, evaluation of knowledge management maturity level and its implementation can be divided into five levels: the chaos of knowledge, awareness of the knowledge necessity, focusing on knowledge, knowledge management, and knowledge as a center of the organization. *First* level, where knowledge is chaotic, is a stage where organizations are in the process of understanding and implementing. Frid's methodology of knowledge management sets his vision, goals, and indexes. *Second* level (awareness of knowledge necessity) is a step further, where Frid's methodology is recognisable and begins the application on units within the organization. *Third* level (focusing on knowledge) indicates that organizations are focused on the implementation of knowledge management in the engineering process, establishing the initial infrastructure, organizing training, supporting community knowledge, monitoring and informing of achievements in the process of knowledge management application. *Fourth* level implies that the applied fundamental activities are changed and that knowledge management is established as a structured process in the organization. *Fifth* level is the maturity of knowledge management, where knowledge is emphasized as an intellectual asset.

M. Stankosky and C. Baldanzi (2001) have developed a framework for the knowledge management related to learning, culture, leadership, organization and technology. This framework shows that knowledge management includes a wide range of disciplines: cognitive science, communication, individual and organizational behavior, psychology, finance, economics, human resources, management, strategic planning, systems thinking, re-engineering, systems engineering, computer technology, etc.. They proposed four main foundation of the organization, important for knowledge management: leadership, organizational structure, technological infrastructure and learning. Leadership is responsible for the implementation of strategic planning and systems thinking, the best use of resources, supporting a culture that encourages open dialogue, team learning, encouraging and rewarding the risk taking, learning and sharing knowledge. Key elements of leadership are strategic planning, communication, systems thinking and business culture.

Structure of the organization facilitates individual learning and supports communities to collect hidden and explicit knowledge within organizations. It should inspire confidence among the people within organization and to encour-

age free exchange of knowledge and managing the changes. The key elements of the organizational structure are processes, procedures, performance of system management and communication. Technological infrastructure enables the exchange of information without a formal structure. It should increase the effectiveness of transferring hidden knowledge into explicit knowledge and to support knowledge sharing within the organization. Communication, e-mail, intranet, Internet, storing data and systems of decision making are some of the key elements to make this possible. The final pillar of learning is establishing organization that learns and uses knowledge. The role of learning is to control information in order to develop knowledge across the company and be used as a key resource for achieving effectiveness.

*Model by G. Hedlund* (organization of N-type) refers on organizations based on knowledge, opened and closed, where each has three types of knowledge: cognitive, experiential, and achieved, as well as four carriers: individuals, small groups, organizations and inter-organizational sectors. Driving forces of knowledge transfer are processes of forming and internalization, with reflection as their mutual acting, expanding and adopting, with dialogue as their interaction, assimilation and sowing, referring to extracting knowledge from the environment and inserting it in the middle. G. Hedlund introduced the concept of N-form corporation (1994). He has pointed that N-form corporation exceeds the M-form, being more assimilative to the new imperatives of organizational modeling based on knowledge. Hence, the corporation derives its wisdom from the “*gray zone between economics, organization theory and strategic management*” (1994, p. 74). The main feature of this model is linking two sets of concepts (hidden and open knowledge) and four levels of social aggregation. There is also a driving force behind knowledge creation, development, transfer and use, resulting in a structure made of three basic dimensions: a) two types of knowledge (hidden and open), and within each three forms of knowledge (cognitive, experiential, realized), b) four carriers (individuals, small groups, organizations, inter-organizational sectors), and c) dynamics of knowledge transfer and transformation, articulated in the following processes: formation and internalization, with reflection as mutual acting; expanding and adopting, with dialogue and interaction of assimilation and seeding, referring to “*knowledge that we extract and insert in the middle*” (Ibid., p. 76). Hedlund has laid the groundwork for his dynamic model, making the difference between types, forms and levels of knowledge. He opposes hidden and articulate knowledge from different levels of social aggregation. This results in a classification scheme, which assumes that cognitive, practical and applied knowledge exists in two forms (hidden and articulated) across the organization, ie. at its different levels. On this foundation he builds

dynamics of knowledge transmission and transformation. Knowledge transfer, repository and transformation are presented as a set of processes, whose interaction through various types and levels of knowledge is provided by creation of knowledge and, therefore, advocates the N-form organizational design.

*Model by D. Snowden* is based on accessing the knowledge management programs. Snowden has elaborated a system of knowledge, focused on the activity and including four main elements: explicit/experiential knowledge, means of knowledge, confidence and certainty/uncertainty, when it comes to decisions regarding: a) goals, and b) conditional relationships. Matrix and model of decision making shows that organization operates with four types of transition activities: classification of formalized, explicit knowledge using systems and structures, classification of informalized, hidden knowledge through psychosocial mechanisms, transforming hidden into explicit knowledge using *Business Process Reengineering*, documentation and releasing hidden knowledge through trust and its dynamics.

*A. Inkpen and A. Dinur* have introduced an empirical model of knowledge management, designed to explain learning and sharing knowledge between partners in strategic alliances. According to them, “*company is a dynamic system of processes, which involves different types of knowledge*” (1998, p. 454). They continued to explore how companies acquire and use new knowledge, especially in terms of clustering in alliance. Their model distinguishes experiential, hidden and explicit knowledge, where the key challenge is conversion of hidden individual knowledge into explicit organizational competence. They (Ibid, p. 456) argue that “*creating organizational knowledge should be viewed as a process in which individuals have knowledge, which is magnified and internalized by being a part of knowledge base in organization.*” Knowledge conversion, creating and learning are performing in multi-leveled context, initiating different processes, depending on the level. At the individual level, the key is identifying and finding a sense, at the group level it is an integration, at the organizational level, integration and institutionalization.

*Model by Van Buren* elaborates IC management, where author includes human capital, innovation, process and a client capital. It is a model of effective knowledge management (virtual organization of those involved in knowledge management in different industries). This model includes two sets of criteria (rules) that can be used to evaluate activity of knowledge management in different companies, related to the amount of intellectual capital, including: a) human capital, b) innovation capital, c) process capital, and d) clients capital and set of regulations, directly related to the financial performance and business effective-

ness. Starting point is the amount of intellectual capital in the company, whose identification is used as an input to the knowledge management processes and so-called catalysts. Despite the fact that they are not visible, they are “*starting points which are crucial for improving the ability of knowledge management in the company*” (Ibid., p. 76). The key processes of knowledge management, involved in the activities and initiatives of the company are following: definition, creation, acquisition, distribution, and use of knowledge. Catalysts are corporate functions of the company/systems/ structures that define, initiate and constitute the structure of company activities: leadership, action, communication, processes, technologies, policies, in terms of human resources and so on. Accent is on interaction process and catalyst, all of which is placed in the context of the company’s business strategy - efforts related to knowledge management should be initiated by strategic intent. Output can be achieved through measures related to the financial success and changing the quantity IC. Van Buren suggests various measures of financial success, including the market-book value, return on equity, revenue and value added per employee. He points out fifty criteria of IC, distributed through four categories of capital (people, innovation, processes and customers), including education level, training period, number of copyrights and trademarks, average age of patents, IT access per employee, and annual sales per customer.

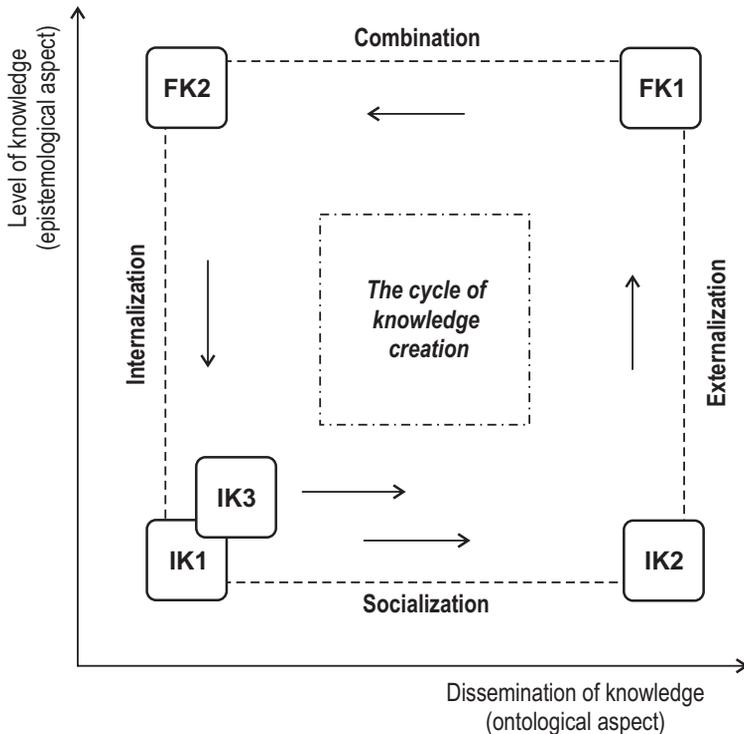
## 2.1 Models of Knowledge Transformation

**D**ynamic model of Nonaka & Takeuchi’s knowledge construction assumes social mutual conditionality of formalized and informalized knowledge between individuals, which is called the knowledge transformation. There are four phases of knowledge transformation: *socialization* (from informalized to formalized), resulting in positional and targeted knowledge (partnership); *externalization* (from informalized to formalized), resulting in conceptual knowledge; *combination* from formalized to formalized (result of systemic knowledge) and *internalization* from formalized to informalized (result of operationalized knowledge).

There are two ways to achieve knowledge transformation: *cyclic* and *spiral*. Cyclic means creating and accumulating knowledge in a certain cyclical process, which involves the following relationships: *intellectual models - goal - concept - system - operations - actions*. In all cycles are present four phases (modes) of

creation, ie. knowledge transformations (Figure 3.7). Spiral knowledge creation is a continuous and cyclic process of transforming one knowledge into another: from individual to the collective, from one level of knowledge to another, from informal to formal, and vice versa. In a spiral transformation, which includes a number of alternating cycles, and contains four abovementioned phases, the cycle is completed within one task. Harder tasks are solved in several cycles and in shorter or longer period of time T, while cycles alternate spirally.

FIGURE 3.7: SPIRALMODEL OF KNOWLEDGE CREATION



Legend: IK- Informalized knowledge; FK- Formalized knowledge

*First phase of the cycle is socialization, which begins with internalization, ie. analyzing previous experience, followed by understanding the situation, identify-*

ing its own positions, defining development goals and formulating tasks, where focus is on constructing the positional knowledge and detecting the tacit knowledge (as a sort of hidden, reserve potential). The last step of socialization is delivering knowledge to participants of the next phase - outsourcing. The world is rapidly changing under the influence of innovation. The future becomes more uncertain, with less possibility of the exact predicting. This is largely contributed by the new technologies, goods and services, new methods of financing and management. All of this requires a continuous learning. Therefore, three basic processes (knowledge construction, training, and troubleshooting) must occur parallelly and simultaneously, which is essentially the *knowledge spiral*.

The Nonaka & Takeuchi's model clearly explains the knowledge spiral, which includes a number of cycles, and every cycle contains the four stages of knowledge transformation (SECI). *Second stage* elaborates hypothesis as the main idea, followed by concept, and then creates a model of possible strategic solutions. Finally, this accumulated knowledge is delivered to participants the *third stage* - a combination which creates a systemic-detailed knowledge and make decisions for prototype of the project and system plan. In the *fourth stage*, the knowledge internalizations have a character of system experience and operating type, due to a collective opinion of the realized project. With time, memorized details are being erased, transforming into systems and blocks.

TABLE 3.2: THE PROCESS OF CONSTRUCTION;  
USING, TRANSFORMING AND IMPLEMENTING THE KNOWLEDGE

*knowledge sources: external and internal* ↓

*epistemological aspect: informalized and formalized knowledge* ↓

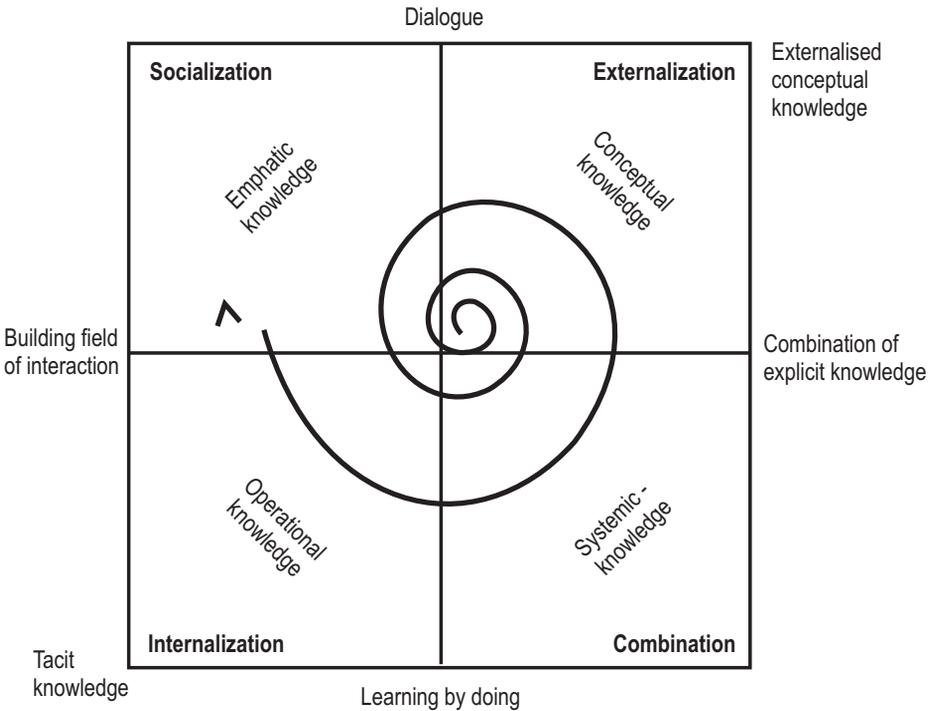
*ontological aspect: individual and collective knowledge* ↓

*objectivization: troubleshooting, development and implementation of innovation projects* ↓

*methods of knowledge transformation: socialization, externalization,  
combination and internalization* ↓

*knowledge realization: goods, services and technology systems*

FIGURE 3.8: THE COMBINED MODEL OF KNOWLEDGE - CYCLIC (PHASE 4), AND THE SPIRAL OF KNOWLEDGE



Source: Barancev Ibid., pp. 155-156.

## 2.2 The Knowledge Creation

Individual learning is an essential precondition for the effectiveness of organization. However, that is not sufficient. Recent studies have contributed a deeper understanding of the group and structure dynamics in the organization, as well as creating a context where learning “thrives” or decreases. Knowledge is analyzed in a context of learning and how the organization can succeed through the use of learning and knowledge as a key resources for innovation, productivity and competitiveness. First, the critical consideration is a widely accepted

hypothesis that harmonization between individual and collective development is a key to competitiveness. Experience shows that this harmonization is not easily achieved in practice. Personal plans and organizational context usually limit the willingness of individuals to express themselves and share their knowledge. Methods and techniques, designed to gather knowledge and experience of individuals, are often not efficient because they do not resolve the tension that exists between organizational need to control (and systematically access), and unconformity of the learning process to management and control. Often companies are not able to respond to radical changes in the business environment, because of the atmosphere in which learning and acquiring knowledge is taking place in an organization, not allowing the full use of manager's and employees working experience. Recognizing a special "political" nature of organizational knowledge is a key prerequisite for the successful management of these processes.

Learning is important conceptual bridge, connecting companies with their surroundings, strategy with operational levels of the organization and previous experience with current practice. In order to realize the learning, it is necessary to decide which knowledge is important, so that individual knowledge can best be transferred to organizational knowledge (and vice versa). The question is: Is it possible to systematically manage the most useful forms of knowledge and what is the weight of knowledge drawn from the top or the bottom of the organization? We believe that it is fundamentally important for managers to find the right balance between individual and organizational learning in order to maximize their potential. To check how this could be done, we will analyze three concepts, which have been deployed after 1990: organizational learning, knowledge management, and development of dynamic capabilities. We will briefly look back on their main principles, give examples of how to develop the best practices and stress the lessons that should be learned. Learning and knowledge are the foundation for dynamics of organizational competitiveness, not only as an organizational resource, but also as the main practices and routines. As a linking tool for individual and organizational development, learning is a critical process for supporting flexibility and imagination, a bridge between the operational and strategic priorities, present and future, known and unknown.

Managing knowledge and learning is not easy, particularly in terms of achieving lasting results. Our examples will highlight the important conclusion that learning and knowledge have social and "political" nature. These are not tangible assets that can be measured and controlled. Learning and knowledge are intangible assets, and the power of learning and acquired knowledge is based on their application in systematic ways that contribute developing formal

and informal mechanisms for linking the internal and external environment. A key challenge is the coordination between individual and organizational goals, which should support development of the organization and its dynamic abilities.

So, the following messages are crucial: In learning, for significant contribution to corporate development managers need to be sensitive to policies that support learning and knowledge, and they should be aware of the positive and negative implications of the “political” guided learning plans; Fostering knowledge and learning from internal and external sources and ensuring consistency between the operational and strategic practices are essential; Formal and informal systems and structures must support, not hinder, ideas and information, in order to support collective learning, managers need to pay particular attention to the legitimacy of ideas and experiences arising from operational level, and requires awareness of organizational power and politics; Learning based on success and failure is essential. Success is often attainable, a successful formula can be repeated; Failure is a better teacher, but since no one wants to fail, his potential for learning is not sufficient (if not a profound failure); Learning culture requires a combination of aggressive and rigorous, searching for ideas while learning on mistakes.

## 2.3 Organizational Learning

In the early 1960s, the idea was that organizations can learn in a way that is similar (with all the differences) to independent learning. Researchers (R. Cyert, J. March, J. Cangelosi and others) have noted that organizations adopted routines and operating procedures, developed over time as a response to accumulated experience and crisis. Through this process, they incorporated the practice and complexity, which were above the knowledge of any person. Some researchers were debating whether valuable knowledge derived from incremental improvements or radical response to major crises. This debate on corporate strategy and innovation (Argyris, Schön, and others) is still actual in the literature. Next major contribution to the study on organizational learning is the work of C. Argyris and D. Schön, in the late seventies.

They have pointed out the difference between incremental and radical forms of learning, with the argument that organizations need to develop a greater ca-

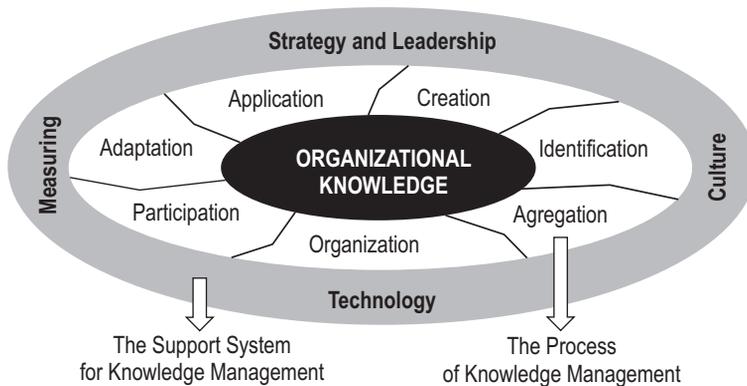
capacity for radical form of learning. They called it a "double loop". It is about learning that involves detecting and correcting errors that occur during modification of organizational norms, policies and objectives. Suggestion was that organizations did not realize the challenge of learning such as "double loop" because managers were reluctant to accept the nature and consequences of adverse news, bad performance or organizational deficiencies. Instead, they established "defensive routines" to protect themselves. This led to a "gap" between their declarative statements and practice. For example, senior managers may verbally encourage radical and critical thinking, but also punish subordinates for suggestions that are radical or critical in terms of current practice.

Theories by Argyris and Schön are often criticized as naive and impractical, because they do not impact the wider organizational system. One decade later, Senge (1990) analyzed them in his book *The Fifth Discipline*, which popularized the idea of "learning organization". He proved that learning must be widely organized, not only based on the behavior of "enlightened" highest managers. His model includes five elements:

- *personal skills* - all employees must develop their own skills through training and education,
- *mental models* - managers must examine their own assumptions about potential discrepancies between theory and practice,
- *team learning* - emphasizing greater awareness of working methods and behavior of groups and teams, whether they support or hinder the collective learning,
- *shared vision* – encouraging creative ideas that can inspire the organization and its members, and
- the *fifth discipline* - systems thinking, which assumes that all the previous elements should be present, because it enhances the effect in the whole.

Senge was not the first one who used the term "*learning organization*", but his work had a great impact for several reasons: his ideas were skillfully systematized, he explicitly enlarged the work of Argyris and Schön and arguments of J. Forrester. His book contains practical corporate examples and was supported by a network of consultants and companies. Years later, many companies have followed the concept of "learning organization", although some were more interested in using this concept for marketing purposes. Here are examples from the 1990s showing that one can find right and wrong activities under the term "learning organization".

FIGURE 3.9: ORGANIZED LEARNING MODEL



Source: Adapted from APQC, [www.apqc.org](http://www.apqc.org)

In the first case, company *Rover* discussed the contents of “learning organization”. *Rover* has been the subject of many studies which showed that its decline and ultimate failure was a result of bad strategy, decision-making, poor production relations and so on. Survived only part of the *Rover* that was a pioneer of “learning organization”. *Rover* has established an independent company called “Rover Learning Business” (RLB) in Great Britain (1990) in order to disseminate the principles of learning within the company. Evident feature was the provision of learning opportunities for all 35,000 employees through personal development plans, supported by £100 allocation to spend on any aspect of personal development.

Four year later (1994) senior managers were achieving significant benefits. During the sales of the BMW group in 1994, it was estimated that the development initiatives of people improved shareholder value by £650 million. *Rover* got the *Global Learning Organization* award, as a global leader in the development of learning organizations and for its commitment to continuous learning. *Rover's* future path was well documented: it was sold to BMW for £800 million, but the new owner was not able to recover it, in 2000 it was bought by *Phoenix* consortium for £10. Shortly after that, *Rover* went bankrupt. Its reputation as a learning organization has outlived the company’s disaster. In an interview, the consultant I. Rose described how *Rover* “has become a lighthouse for all learn-

*ing organizations.*” But a new study has shown that a large part of that reputation was based on rhetorics. Research has shown that systematic calculation of the financial benefits from learning initiatives in the *Rover* did not exist. Most of the information that appeared in the paper were based on a superficial calculations of senior managers on the way to the place of presentation or meeting. Also, the emphasis of the program that teaches the organization is on staff, but in practice it did not seriously spread widely, but everybody in the “*group of chief executives were doing the same - the old way.*” On the positive side, the initiative have enabled the significant benefits for individuals, who were enthusiastic. Even employees, who left in the process of workforce reduction were still enthusiastic about the initiative of learning to which they were exposed. However, this had very little effect on the company, for two reasons. *First*, not more than the first principle of Senge’s five principles of “learning organization” was accomplished. *Second*, a concept was used by senior managers mainly as a marketing story, and the initiative was not actively supported by their behavior. In short, learning was used as a tool for improving the company’s reputation, without a fundamental transformation.

Organizational learning is envisaged in many ways. Dominant concept describes learning as an activity to increase knowledge through changes in organizational behavior, caused by identified deficiencies in performances when creating advanced knowledge (Argyris and Schön, 1978). Insufficient performance is described as a lack of perception, communication and inertia of organizational routine. That is why learning happens when organizational members oppose “the existing theories” (Argyris, 1991) or mental models (Senge et al., 1994), ie. when individual perception does not coincide with reality. In that case, the organization learns. The managerial perception can change and adapt through the process of learning in order to master the new reality. However, creative behavior in the company and constructive response to the changing market environment are also necessary. The above conceptualization of learning is consistent with hyper-competition, where constant innovation is constantly changing the competitive environment.

Organizational learning is defined as a process of purifying and analyzing the changes in existing routine. This type of learning is called “first order learning”, “second-order learning”, “single loop”, “double loop”, “first” and “second”. According to the first order learning, the existing abilities are improving by training the current practices. In contrast, second order learning creates new knowledge that enables organizations to change practice. Adherence to certain capabilities may become a “trap” preventing the organization to consider new responses to variable market conditions, ie. to update knowledge through learn-

ing. This is an imperative, for only thus can be responded to market changes and, possibly, with implementing the elements of the first and second levels of learning. Learning is individual and takes place in a social organization with the inclusion of cognitive and social basis for communication. Every individual is specialized in organizational ideologies, beliefs, values and norms. These elements of organizational culture may influence the formal and informal organization, and decision-making. Ideology/beliefs and norms have preceded, as well as the consequences of the higher and lower levels of organizational learning. Higher level of learning is a double loop (Argyris, 1991). It reveals the contradictions and resolves them. Detecting contradictions creates knowledge, changing individual and organizational ideology (beliefs), values and norms. Higher level learning affects the entire organization, developing understanding of the causes and complexities, that bring new activities. It is characterized by changes in decision-making and in the organization itself. In contrast, lower level learning (one loop) develops through repetition, in the familiar context, focusing on the behavioral results and formal institutional rules. One loop learning maintains the organizational ideologies (beliefs), values and norms. It allows detecting errors in the system of rules.

Strategic response is realised by application of the learning process at a higher level. That, over time, enables development of corporate value, which is built on famous axiom by Reg W. Revans: For individual to survive, his rate of learning (L) must be equal or greater of the rate of change (C) in the environment, ie.  $L \geq C$ . This attitude becomes a central value for solving organizational issues. In times of uncertainty, this is vital position, which should exist at all levels of the organization, from the board of executives to the meetings of department managers, from sales teams on the field or engineers for maintenance to the operators in call center. In a complex and turbulent outer environment, traditional hierarchical organization can not successfully implement a higher level learning. This type of organization focuses only on the inside. An effective approach to strategic response means turning the hierarchical pyramid upside down. This enables opening of the organization to the outer environment and updating the knowledge, which is an important aspect of preparing an organization for strategic response.

Perspective of organizational learning is complementary to the concept of dynamic capabilities. They reflect the corporate ability to modify existing and develop new capabilities for creating competitive advantage in a variable environment. Some argue that competitive advantage comes from learning and creating knowledge, which increases the range of possible corporate activities. Creating potential activities is similar to identifying the latent options, which ex-

pand strategic choices available to the management. To the extent that organizations have a variety of alternative activities, the greater is the ability to change their market position in an uncertain environment.

Constant research of external market conditions and opening to the changes is necessary for creating a competitive abilities as a strategic response. The possibility of learning about the changes in the environment is affected by managerial cognitive understanding, which is reflected in its structure of beliefs. To conduct the process of learning and to accept new knowledge and understanding, organizations must reject parts of their existing dominant logic. Changing the prevailing beliefs facilitates adoption of knowledge. Even successful companies show a desire for change. In time, the managerial mental model can disappear, because the existing organizational practice is gradually becoming obsolete. Learning can include a combination of these types of knowledge creation, learning and the process of disintegration.

TABLE 3.3: ORGANIZATIONAL LEARNING AND MARKET POSITIONING

Decision about learning ↓	Concepts (variables). Deciding on a new teaching about the market (endogenous variable of decision making)
Learning about the market ↓	Learning that complements the knowledge of market conditions (costs related to learning)
Market knowledge ↓	Skills based on knowledge that enable firms to adapt its market position
Decisions on adaptation ↓	Deciding whether to reposition the company in the market (endogenous variable of decision making)
Market positioning ↓	Maintenance or adaptation of strategic positioning of the company in the market (adaptation costs)
Economic results	Cash flow generated from the strategic activities (revenues, costs, profits, net present value)

Table 3.3 shows the process of implementation of the proposed approach to organizational marketing learning and positioning. Marketing learning should be a continuous activity of the business process. Its main goal is to coordinate organizational resources (human, financial and physical) with customer's needs and desires. It is a part of the overall competitive strategy context, where advantage has the company closer to the customer.

This process is complex and challenging, because it involves skillful management and number of variables. While some of these variables are under control of the organization (availability, affordability and sustainability) others are beyond the control of interest rates, new legislation, and economic trends. To successfully meet the consumer needs it requires an organized activities-monitoring and valuation of the market environment. Marketing knowledge contributes to the managerial and/or political decision-making. Corporate and strategic managers need reliable information on the market environment and competitors to be able to determine the strategic direction of the organization. Given their importance, marketing information is necessary to collect, organize and apply in a manner appropriate to decisions. In searching for the marketing information, it must be clearly understood what is needed to make appropriate, responsible decisions. Research topics may include internal to external areas. In order to improve the marketing learning, it is necessary to consider: an analysis of market share, market potential and its features, sales performance, business trends, economic forecasts, products, competitors, studies cost, product testing and information systems. Integrated with marketing activities, marketing information is viewed as a resource, but transient and of limited duration. Like other resources, it has a value when used. When managers know less about the marketing problem and when the risk associated with a wrong decision is higher, the information becomes more valuable. There is a strong link between knowledge and the way people use it. Being well informed (educated) is not only having the information but knowing how to use it in action and while interacting with others. In short, knowledge reflects the way in which individuals and groups balance the inherent conflicts contained by what is expected of them, what they expect and, consequently, what they do in the context of the societies where they belong. Social and collective nature of knowledge has become the primary focus of research. It's been shown that practical knowledge is often developed and distributed under the "society of practice" - a group of people dealing with similar issues, whose relationship is based on the their work, reinforced by the social bonds. This informal knowledge is often different from the formal systems and manuals that provide instructions on, for example, how to repair complex machinery or how to navigate the aircraft carriers.

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**Box 19 -A Conceptual Model of LO and KM**

Based on our literature analysis we have developed a holistic conceptual model including both LO and KM. Even if the holistic perspective implies that the model is on a fairly generalized level, it is necessary if the aim, to serve as a basis for developing guidelines for how to introduce KM and the work to become a Learning Organization, should be fulfilled. The model is presented in Figure 26.

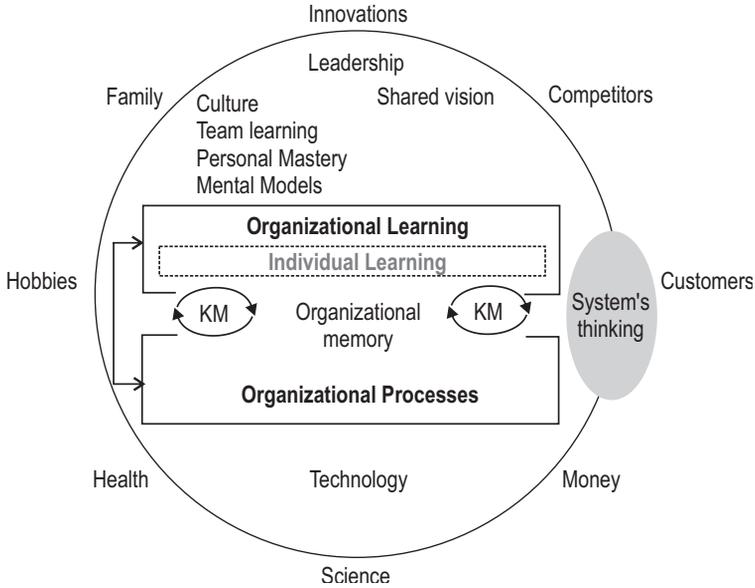
The work of Senge (1990) has been widely referred to by both academics and professionals. It covers the main aspects found in our literature review about LO. This implies that Senge's work about the five disciplines should be a central part of the conceptual model. The fifth discipline, System's thinking, is the conceptual cornerstone that underlies all of the disciplines. It is a cornerstone of how learning organizations think about the world, and how they look at the world. Thus the conceptual model is shaped as an eye which regards the world from a system's perspective. Personal mastery, Mental models, and Team learning are as we see it different perspectives on the organizational culture. Culture is the result of the organization's accumulated learning about values, assumptions etc. It evolves with the strength of that culture; in turn dependent on the length of its existence, the stability of the individuals' membership, and the emotional intensity of the actual historical experiences they have shared. It is the leader who initiates this process by imposing his or her beliefs, values, and assumptions, but culture only arises when individuals' assumptions lead to shared experiences. The importance of a Shared vision is well stated in the literature. There cannot be a learning organization without a shared vision. A shared vision is a part of the organizational culture. The importance of the vision is well stated in literature, and the conceptual model must therefore place great emphasis on this. As consequence, it should be an obvious part of the Learning Organization, and not only of the organizational culture.

In accordance with our analysis the model regards LO and KM as system and subsystem. They are two inseparable parts when an organization wants to become a learning organization. A LO can be compared to a learning system with distinctive characteristics that are able to meet the demands of its internal and external environments. The model clearly shows different types of both external and internal demands. Learning and knowledge-creating is performed by individuals, but it is important for the organization to provide the appropriate context for them. A LO is an environment that promotes a culture of learning, and that ensures that individual learning enriches and enhances the organization as a whole. This environment requires a shared vision. To build this type of culture including a common vision is a management responsibility.

KM aims to create value for the organisation. It enables individual learning, and in an organizational perspective this individual learning contributes to both the organizational learning and processes. All in order to reach business values. KM must also be integrated into every mission critical business process, and be adapted to business and knowledge processes. When an individual learns something he or she obtains new knowledge, which will be stored (hopefully) in their personal memory and used both in its present form but also as a basis of transformation to new knowledge. In order to stimulate learning of other members in the organization the knowledge has to be stored in the organizational memory, e.g. in books, documents, databases etc. Learning results in more potential knowledge to store, and in this perspective we consider that an organization can learn. The organizational learning depends on individual learning, and when an individual has

learnt the organization as a whole has learnt. This is in accordance with the System's thinking of Senge (1990).

FIGURE B24: A CONCEPTUAL MODEL OF LO AND KM



Source: Aggestam 2006, p. 300.

Individual learning becomes organizational know-ledge when organizations function as hold- ing environ-ments for knowledge, and when organizations directly represent knowledge in the sense that they embody strategies for performing complex tasks that might have been performed in other ways. One part of organizational knowledge is stored in IT-supported repositories, organizational memories. When stored knowledge is shared and used it gives rise to learning and possible new knowledge. KM is concerned with new knowledge. It supports organizational learning by both taking care of the result, the knowledge, and making the result reachable for individuals in the organiza- tion. Therefore it stimulates learning and the creation of new knowledge. KM is a prerequisite for a LO, the learning culture must assume that accurate and relevant information must be capable of flowing freely in a fully connected network, but KM's efficiency is in turn dependent on the LO.

## 2.4 Strategic Knowledge in the Function of Developing Dynamic Capabilities of the Company

The idea of dynamic capabilities is based on organizational learning and knowledge management. Particularly, there is a need for systematic support, integration, learning and crucial role of senior managers. Interaction between and within organizational structures, systems and human behavior, is very important. Strategic knowledge is necessary as a major determinant of value creation in a dynamic and knowledge-based market. Based on this fact, new models should improve strategic knowledge through learning about the market and environment, in order to effectively respond to the challenges of change. New knowledge of environment is gained through information. Knowledge, information and art of their use, with new ideas, are pushing the limits of social-economic growth and development, becoming a core wealth and production resource. New business environment is characterized by telecommunication technologies, satellite, computer equipment, softwares, operating protocols and complex global information infrastructure. In terms of n.e. all of this is increased by the speed of transactions. Therefore, at the company level there is a need for new knowledge.

According to T. L. Friedman, a document that has defined Cold War was an agreement (negotiations between countries). Document that has defined the post-war period was a bargain (negotiations between banks and corporations). The cornerstone of the Cold War was a territory and military power. Final calculation of the cyber era is speed: trade, travel, communication and innovation. Einstein's formula  $e = mc^2$  has been replaced by Moore's Law, where the power of computer chips doubles every 18 months. Innovation has become the driving force of global economic developments. The new economic order is based on knowledge and continuous innovation that rapidly change the market conditions. Global entity is very dynamic, uncertain, turbulent and complex. There is a clear need to develop organizational skills and processes that will answer all of these environmental changes in an efficient manner. These responses must be far-reaching and adapted to the consumer, whose needs are changing in every sense: political, physical, economic, social, technological and commercial. What is the critical change in a relationship between the management of organizational structure and internal processes and the current market environment? It is a new knowledge. A struggle to attract knowledge as the key strategic response. Continuous learning must be encouraged at all levels of the organization and society.

The superior performance of the organization depends on corporate capabilities that enhance the learning opportunities about the current market conditions, enabling it to adapt its strategic position to variable market conditions. Accordingly, we will consider organizational changes, organizational learning, knowledge creation and strategic perspectives for developing a model that encourages understanding the effects of new markets and corporate repositioning. Sustainable competitive advantage must rely on existing capabilities specific to the company, but focusing on dynamic capabilities suggests that the current value creation in relation with the process of learning, which improves the ability of corporations to be strategically sensitive (Teece, Pisano and Shuen, 1997). Discussions about this issue did not initiate systematic research on potential corporate value creation at the dynamic markets. According to Iintch, D'Aveni and Lewin (1996), *"it is necessary to continue research on how to manage organizations that are under pressure to respond to the uncertainty ... of hyper-competitive environment."*

In this regard, the key motivation of this review is to improve organizational capacity in order to successfully deal with the complex and turbulent environment. Accordingly, we will emphasize the effects of the value creation through a learning process, which improves the knowledge necessary to change the strategic position in the light of changing market conditions. It is necessary to analyze the effects of changes in market conditions and the importance of learning and adapting the market knowledge. This provides the basis for an alternative policy responses and possible corporate decisions to change market position. Uncertainty is incorporated as a current stochastic change in market conditions due to the influence of hypercompetition, while periodical generating of cash and volatility of cash flow are the main output variables. In an era where the uncertainty is large and information is imperfect, the market exchange has more flaws than transactions within the company. In the old economy, dominated by a high degree of certainty and information predictability, transactions within firms are more efficient than market exchange. This is compatible, with the works of R. Coase (1937) and O. Williamson (1975), who have set the analytical distinction between exchange over markets and transactions within the company. According to them, size of the company was determined by answering to the Coase's question (Ibid., p. 30): *"Is it profitable to make additional transactions under the auspices of organization"*. Furthermore, they pointed out that uncertainty and imperfect information increase transaction costs within the company. Our opinion is that it increases the risk, especially by the uncertainty of the results. Many organizations are faced with the question: How to increase the confidence in achieving desired results, and how to effectively limit the threat

to acceptable levels and make decisions about research opportunities? Every organization should have a risk management strategy, designed to reduce uncertainty. The application of this strategy, of course, must be based on organizational learning.

### 3. THE KNOWLEDGE APPLICATION

The knowledge application is the final step in the cycle of knowledge management, including learning, encoding and sharing knowledge, which afterwards enables its application. If the final step is not completed successfully, everything done previously is futile. Knowledge management is achieved only if the application knowledge is completed. However, today it is imperative to understand what kind of knowledge is needed to specific groups, teams or individuals, and how to make them apply it at work. Knowledge management usually refers to one of two general goals: reusing knowledge in order to improve efficiency and innovation, and introducing more efficient working methods. The knowledge application is related to the actual use of knowledge which has been learned or created and inserted in the KM cycle.

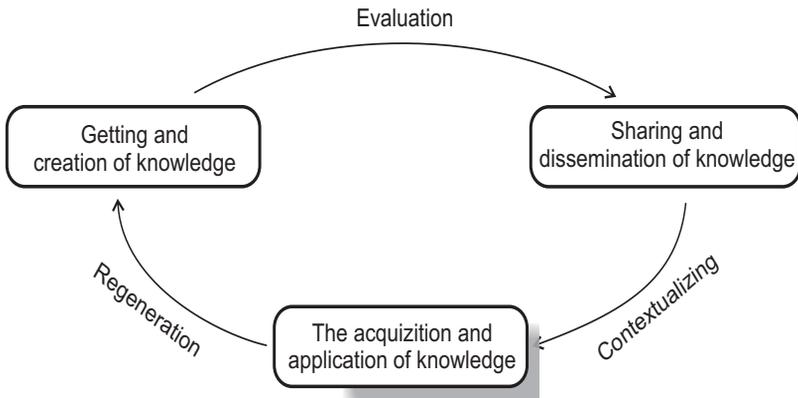
The knowledge spiral is completed by successful internationalization of knowledge. Internationalization process consists of accessing and understanding the contents, as well as deciding on the best working methods. Therefore, it is applied to decisions or solving problems in real life. Reuse of knowledge is necessary, and also beneficial, and performed to avoid “inventing the wheel”. Learning organizations are based on the corporate memory and “knowledge objects.” Corporate memory is often incomplete because it includes only explicit knowledge. It is also essential to insert valuable tacit (hidden in individuals) knowledge in the corporate memory, not only for reusability of tacit knowledge, but explicit knowledge. Reuse of explicit knowledge enables the realization of long-term comparative advantages. While reuse of tacit knowledge can be beneficial to individuals, who seek advice from experienced colleagues, the knowledge objects, stored in knowledge respiratory, are available to all employees and as such, they remain purposeful.

Every organization faces many problems in the process of knowledge application. The basic question is: How to apply knowledge in solving various problems; innovation, creativity, intuitive design, good analysis and efficient project

management? Knowledge management systems, which focus on collecting, storing and evaluating various personal knowledge, used in the interaction between individuals, have proven costly and unsatisfactory. Organizations that do not realize the importance of tacit knowledge will repeat mistakes related to this methodology. A common assumption in the past was that all relevant knowledge can to be packed in packages of the “best practices”, which can be repeated if necessary. When faced with the reuse of knowledge, as an important issue of knowledge management, there are new issues or, at least, different ways of finding solutions to the problem.

How do we find the necessary components (of knowledge)? How do we gain confidence that these components will do what we need? What is the distance (organizational and geographical) between the creator of these components and its user? Are there people who have used a component of knowledge that we can discuss and learn from them? Do we have access to the author of certain components? What do other people think of the component efficiency? How should we test a specific component?

FIGURE 3.10: INTEGRATED KNOWLEDGE MANAGEMENT CICLE



How will this component integrate into our environment? Going further, we will discuss the knowledge application, with emphasis on the key to organizational success in terms of global competition, the ability to collect organizational skills, effective reuse of knowledge gained with effective tools, through synthesis of knowledge, enabling intelligent identification of problems, better strategic

analysis and the best selection of strategic directions. Organizational memory enables making the most intelligent business decisions. This is the case when individuals have access to data, information and knowledge that is stored in organization respiratory. However, just taking the stored knowledge is not enough. It must be accompanied by the knowledge application, and the success of its application is a function of individual characteristics, knowledge content, purpose of its reuse for particular task and the organizational context or culture.

Individual differences play an important role in knowledge sharing behaviors. Knowledge workers differ in terms of familiarity with the subject and in personal and cognitive style. Cohen and Levinthal (1990) found that knowledge sharing rather happens when there is a basis of relevant prior knowledge. A number of studies (eg. Ford et al. 2002; Kuhlthau, 1993, Spink et al. 2002) have found a significant correlation between online behavior in research and cognitive styles of learners. On the other hand, the business world favors the use of instruments, such as *Myer-Briggs Type Indicator*) for evaluation of personal style (Myers et al., 1998). Several studies have been conducted to explore the interrelationships of MBTI type with behavior in the knowledge transmission. In a study of *Waterhouse Coopers* consulting firm (1998), Webb showed that a strong personality is very important in dissemination and sharing of knowledge, regardless of qualifications and prior experience. Characteristics of the person, who wishes to apply or reuse knowledge, also affect the efficiency of finding, understanding and using organizational knowledge. Individual characteristics may include, for example: personal style, preferences in learning and receiving information, and the best methods of putting knowledge into operation. A good framework is Bloom's taxonomy of learning objectives (Bloom, Mesia, Krathwohl, 1964), created to help teachers to set learning goals for learning activities. It can be easily adapted to objectives of the knowledge application for each object in knowledge respiratory.

One of the ways to personalize knowledge is imagining the company with one person or a library with one person. In such assumption, all sources of knowledge are available to one person, reflecting its preferences, its education and so on. Personalization and profiling are currently popular means of characterizing a particular website visitors. This is particularly true in virtual shops, where data on consumers can be analyzed to improve market efforts. However, in the knowledge management we are less concerned about the collection of data for the marketing profiling and personalization, and much more about opportunities to ensure that finding information and knowledge application are conformed to every knowledge worker. If a knowledge worker easy find, understand and internalize certain knowledge, he will then successfully apply that

knowledge. Instead of using profiling technology, for better understanding of the consumer can be used similar techniques to monitor trace of individual interaction with a set of corporate memory interface. This alternative approach will create a user model, which helps to better understand the types of interaction by the worker, in order to optimize the knowledge application within organization. For example, push technology is based on user models that look at historical information requirements, in order to push or automatically send a similar new content, which becomes available. We should be able to find and use content based on personal model of individual and his prospective of the reality. It is usually influenced by his education (eg Information Technology vs. Sociology). This model is often represented as a semantic network.

There are also systems that monitor user activities on-line and interpret it in context, based on the traces they have left behind. They are successful for the tasks that are well identified and where knowledge can be described in a clear ontology (eg. a template for the mailing address). This approach is based on user interaction with a computer system in order to perform the tasks that lead to system changes. Observer (software routines) detects these changes in accordance with observation model for generating the logs or records. Trace is then analyzed in order to identify and separate significant episodes, which are interpreted in accordance with given explanations for each job (task). Each episode is a pattern (model), which can be mapped to a task, subtask or specific step, which is a part of the subtask. For example, if user tries to locate, open, print a file, there are three episodes of behavior related to locating, opening and printing the file. These episodes can be used by agents assistants that help users in work. Episodes performed by agents can be reused in the future. That way, the system has modeled behavior of the user and can recognize how and when to take certain jobs (tasks). An important factor is that the user modeling is continuous process, not a one-off. Dynamic profiling system should be developed by combining human and automated means of monitoring, in order to continuously adapt to a changing environment, organizations and individuals (different job responsibilities, different preferences, new skills and new interests).

### 3.1 Bloom's Taxonomy of Learning Objectives

**B**loom (1956) has classified knowledge within a hierarchical scheme according to psychomotor skills, affective domain (eg, attitudes) and cognitive do-

main (eg, knowledge). Cognitive domain is often used, although the changes in attitude (affective domain) are often required in knowledge management. Bloom points out that learning is hierarchical, ie. learning (objectives) at the highest level depends on gaining knowledge and skills at lower levels. Cognitive domain of taxonomy is shown in Table 3.4. The levels are: knowledge, comprehension, application, analysis, synthesis, and evaluation.

The affective domain includes emotions, such as feelings, values, appreciation, enthusiasm, motivation and the like. Psychomotor domain includes physical movement, coordination, and motor skills. Developing these skills requires practice. It is measured in speed, precision, distance, procedures, or techniques.

TABLE 3.4: BLOOM'S "COGNITIVE DOMAIN TAXONOMY"

<i>Level</i>	<i>Description</i>	<i>Verbs that can be used</i>
Knowledge	Remembering previously learned material.	Underline, repeat, define, describe, guidance, identification, labeling, matching, naming, formulation.
Understanding (cognition)	Ability to understand the meaning of material (eg, translation from one format to another, an assessment of future trends, explain or give examples).	Classification, conversion, discussion, explaining, generalizing, giving examples, paraphrasing, rewording, summarizing, reviewing.
Application	The ability to use learning materials to the new and concrete situations by applying rules, methods, concepts, principles, laws and theories.	Articulating, assessment, computer design, determination, development, discovery, establishment, expansion, operationalization, participation, forecasting, provision, showing, solving, use, application, demonstration, sketching, practicing, illustration.

<p>Analysis</p>	<p>The ability to divide the material into components in order to understand its organizational structure. Identifying the parts, relationships among parts, accepting the organizational principles.</p>	<p>Analyzing, correlation, diagram, differentiation, focus, reasoning, showing, displaying, acceptance, detachment, division, comparison, enumeration, relating, research.</p>
<p>Synthesis</p>	<p>The ability to assemble the parts in order to form a new whole. Creative behaviors emphasized in the formulation of something new.</p>	<p>Customization, categorization, collaboration, combining, communication, preparation, creation, design, facilitation, formulation, generation, incorporation, individualization, initiation, integration, modeling, proposing, preparing, organizing.</p>
<p>Evaluation</p>	<p>The ability to evaluate the material based on specific criteria.</p>	<p>Assessment, conclusion, criticism, decision making, defending, judgment, justification, evaluation, evaluation results, priority, choice.</p>

These taxonomic categories can be used from “inside out” in order to understand what users are trying to do. The level of internationalization can be identified for effective enforcement. For example, one can set a minimum level for worker to understand and properly use the object of knowledge. This feature can be incorporated in response to the user model. Bloom’s taxonomy is a means to determining not only worker’s knowledge (skills or expertise), but the level of performance that is expected (higher level). Using cognitive skills of Bloom’s taxonomy enables qualifying a particular object of knowledge, for example, the most appropriate practical procedures on how to successfully present a summary of the project team in the preparation of project proposals. Knowledge worker preparing an offer should have a level of understanding that enables critical judgment necessary to accomplish the task for the required knowledge level. He must not only be skilled in selecting team members to be included in the proposal, but also to overlap their resume into a form that proved to be the best in the previous practice.

Another example, when using the affective domain of Bloom's taxonomy, again can be used in the best practice, but this time must be determined the best method of evaluation whether candidates who meet the required technical skills also have the matching "fine arts", such as team work, collaborative approach to work, individual knowledge at the expense of group work. Bloom's taxonomy provides a good basis for estimation of the methods for knowledge application. Often in the KM, using some contents of knowledge base means that they are applied or re-applied. However, this methodology is far more useful to estimate how learning affects the knowledge, stored in the knowledge base, particularly how it affects the new methods. Only through behavioral changes can be concluded about the effects of the knowledge use, and Bloom's taxonomy provides a detailed framework for assessing the extent to which knowledge is internalized (using Nonaka-Takeuchi model of 1995). For example, at lower-levels of cognitive skills, clear recognition that knowledge exists in the organization can easily be seen, because the workers are able to locate content within the knowledge base. Access is monitored through statistical log fail, which is similar to the number of visitors attracted to the website. The knowledge application, however, requires that knowledge workers achieve a much higher level of understanding, such as analysis, synthesis and evaluation. Only at these levels the knowledge is truly applied. Opposite to someone who points out the templates to knowledge base, knowledge application will manifest itself in the way the employee performs at his work.

### **3.2 The Knowledge Application at Various Levels**

**K**nowledge Management Systems (KMS) are tools oriented to support knowledge management. They have evolved from tools for information management that have integrated many aspects of collaborative working environment with a system of information and documents (Ganesan, Edmonds, Spector, 2001; Greif, 1988; Kling, 1991). The key features of the KMS are support: communication among different users, coordination of user activity, cooperation between user groups on the creation, modification and expansion of the products and controlling processes to ensure the integrity, and monitoring the progress of the process. Systems that support KM provide specific functions related to: communication (e-mail and discussion forums); coordination (divisible calendars and task lists); cooperation (divisible objects and workspaces); control (signs of internal control and automatic version control). KMS focused on

user contributes to the organizational culture of cooperation by giving sense to the community of users and supporting reciprocity among users (Marshall and Rossett, 2000). KMS expands horizons of employees as knowledge workers by giving them the means to create knowledge. KMS supports many information functions, including: learning and indexing, collecting and archiving; finding and evaluating; creating and applying; combining, comparing and modifying, and monitoring (Edmonds and Pusch, 2002).

These KMS features enable the individuals to arrange significant activities around divisible objects, which can be reused to achieve specific goals. KMS is based on distributive nature of the work and expertise (Solomon, 1993). In the business and commercial activities, KM technology is used to support organizational learning (Morecroft, Sterman, 1994; Senge, 1990). Dynamics of the global economy puts priority on organizational responsibility and flexibility. Partly as a response to the highly competitive global economy, KMS technology has emerged as a new generation of information management systems. In contrast to previous systems of information management, KMS is designed for multiple users with different and changing requirements. The key KMS technologies include object orientation, extensive communication and adaptive systems. Object orientation enables creating knowledge that can easily be found, modified and reused. For the users separated in space and time, wide communication provides to work on large data objects efficiently as a team. Adaptive systems recognize that different users may have different requirements and preferred working styles. MS can be regarded as a system of activities involving people who use the facilities (tools and technologies) to create objects and products that represent knowledge in order to achieve the goal of being divisible.

Previous systems of information management were focused on a small part of such a system, like a small set of objects in the form of a recorded collection or simple communication between team members. KMS includes a whole system of activities, but it still focuses on the aspect of human-users (people with common goals), not on the technology. KMS has already achieved considerable success in business and is spreading to other sectors including education (Marshall, Rossett, 2000) and instructional design (Ganesan, Edmonds, Spector, 2001). Architecture of organizational knowledge management has at least three levels: *data layer*, which is a unified abstraction through different types of data, with potential mechanisms for storage (eg database, video, audio), *process layer*, which describes the logic that links data with its use and users (other people or systems using data) and *user interface*, which provides access to information resources of the company, through logic incorporated into the process layer.

KM can not support the simple integration of mass data. It requires structuring and navigation of content with the support of meta-data, a formal description of the content and relationships with other objects or content knowledge. Meta data includes a number of tools and techniques available for the implementation of knowledge application in the KM cycle. Tools for spreading and publication include certain design type of stored knowledge. It will have features, such as routing and delivery of information to those who need it (push vs. access. Pull). E-mail or workflow are examples of technologies that work on a “push” principle, informing users of any changes, new contents or information on expired content. Harmonization of forms can be done for user profile in order to determine where to push the content. Other tools help structure and navigate through content. They provide a classification scheme for organizational knowledge assets. Such navigation is to be found in the user interface. When content is properly indexed and organized, many windows can be available for the same content to meet the needs of the user and the task.

### 3.3 The Knowledge Reuse

Reuse of knowledge includes withdrawal and acceptance, as well as the actual knowledge application, if using Bloom’s taxonomy. The knowledge reuse starts with formulation of questions for the search. Here could be seen the difference between the professionals and expert, who knows the right questions. After quiring the system, begins quiring the expert knowledge using a system of location expertise, then selecting the appropriate expert, and/or council, and after that knowledge can be applied. The knowledge application may include general instructions and its adjustment to the situation, which sometimes refers to *knowledge recontextualisation* (where decontextualisation has occurred to a certain level while collecting and codifying a knowledge). There are three main roles required for the knowledge reuse: *knowledge creator*, a person who creates or documents the knowledge object; *knowledge mediator*, one who prepares knowledge for its reuse by indexing, cleaning, packaging or marketing the knowledge object; and *knowledge re-user*, who takes over, understands and applies the knowledge.

However, these roles are not permanent nor the same person simultaneously performs all of them. The knowledge repackaging is an important step in adding value, a step that may involve people, information technology or, often,

a combination of both. For example, automatic classification systems may index the content, but the loop almost always requires a man to confirm and add context, command for suspension and other useful indicators for effective use of that knowledge object. Markus (2001) suggests that there are *four types* of knowledge reuse situations pursuant to individual who performs the knowledge reuse which is fully compatible with a user and with the approach adjusted to tasks referred in this section. These are the four following situations: team work of knowledge producers, creating knowledge for its reuse; team work of practicians, working together and reusing knowledge of others; seeking expertise from novices; and sorting the secondary knowledge. Team work of knowledge producers is usually performed in collaborating workgroups. A common example is the MD, who reads the patient's chart to determine diagnosis by other doctors or teachers, dealing with special education, or by therapists who issue the student files, to determine which interventions have been done to the patient. This is the easiest way to re-use knowledge, because everyone is familiar with the knowledge content. They share the same context, which makes the knowledge use quick and effective. Practicians who share knowledge are members of the same professional community. This form of knowledge reuse requires a higher level of personalization and filtration. Re-users need to confirm the credibility of the knowledge. They must believe that the content is valid and should be applied. Their contexts will not completely overlap, so the knowledge reuse will require contact with others, who are familiar with the knowledge object.

Beginners eager to learn are often found in the learning scenario. Unlike the previous two types of re-users, beginners are the farthest or the most different from the knowledge object's author and those experienced in their use. Knowledge mediators have a greater role in ensuring that novice access to general information (such as FAQs, introductory texts, glossaries), before attempting to apply the knowledge object or to contact experts in using the same. EPSS and other kind of support, such as e-learning modules, which are also of great help to re-users. Secondary knowledge miners are analysts, trying to extract interesting patterns by studying the use of knowledge repository. They are analogous to the librarians, who periodically join the collective possession of the library, whether physical or digital, in order to see which items are not actively accessed and, perhaps, should be archived or replaced by newer and better practices. Different types of re-users will in many ways be associated with the knowledge repository and will differ in needs for support. Therefore, repositories should be able to personalize each individual differently or at the level of appropriate community.

The knowledge repositories are usually intranets or portals of certain type, used for storing, managing and influencing the organizational memory. Currently, there are different types of knowledge repositories, which can be categorized in different ways. A knowledge repository contains more than one document (Document Management System), data (Database) or records (Records Management System). It contains valuable content, which is a mixture of personal and explicit knowledge based on the unique experiences of individuals who are or have been part of the company, as well as the knowledge that has been used, tested and proved to function in work situations. There are so-called *Data Warehouse*, which include a collection (set) of data, isolated from external and operational base, and stored in a separate database ie. data warehouse. R. Kimball (2000) in his book *The Data Warehouse Toolkit: Practical Techniques for Building Dimensional Data Warehouses* defines a data warehouse as a copy of company's transaction data, specifically structured and tailored for querying and analyzing. Here, data is collected and organized to be accessible to managers, so they can quickly and easily use it for the analysis of their business. According to B. Inmon (1992), data warehouse is subjectively focused (on object), integrated (in the same format), related to time and essentially unchangeable data set, in order to support management decision-making.

The main goal of a data warehouse is to release information "locked" in the operational databases and to "mix" them with information from other (external) sources (data of the competition, demographic trends, sales trends, etc..). Information "highway" provides access to a growing number of data sources. The main function of a data warehouse is the collection of data and the creation of a logical and integrated subject-oriented information. Multidimensional data structure provides great opportunities to explore many details of analytical processing such as aggregation and detailed performance (*drill up, drill down, drill through, cross tabulation, slice and dice requirement*), rotation and the highlighting one dimension while others are in the background (pivoting), forecast modeling, graph (charting), statistical analysis (trend, clustering) and so on. These techniques enable continuous finding new information for managers, to serve them in strategic, tactical and operational decision-making. By introducing the concept of data warehousing, operational bases are no longer burdened with complex queries. The whole information system now consists of two parts: operational and data warehouse, which is more efficient and easier to control and restructure. To meet its goal, a data warehouse must meet the following requirements: access to all employees, a large amount of detailed data, continuous refresh (update) with new data, immediately when a business event occurs, a continuous availability and design so it can serve each purpose, the ability to

capture and interconnect data in order to get all the performance indicators of the company (*slice and dice*), filtered data and confidentiality of sensitive data.

TABLE 3.5: REVOLUTIONARY STEPS IN STORING DATA

Period	Steps	Business inquiries	Technology	Features
60's	data collection	what is the total income in the last 5 years?	computers, tapes drives	static delivery of historical data
80's	access to data	what was the sales in certain retail units in an area over a period?	relational database, SQL, ODBC	dynamic delivery of historical data in a single level
90's	data warehousing and decision support systems	what was the sale of some retail units in an area over a period?	OLAP, multi-dimensional databases, data warehouse	dynamic delivery of historical data with multiple levels
2000's	data mining	what will happen with the sale on allocation for a period and why?	advanced algorithms, multi-processor computers, massive data-bases	predictable and proactive information delivery

With the growth of databases grows a needs for storing a large amounts of data, analyzing and visualizing in order to obtain the necessary data, information and knowledge. Today is increasingly implemented the concept of so-called finding (getting) new data (*Data Mining Data Mining*), used in storing and retrieving data and knowledge, and discovering knowledge in databases, with

a greater emphasis on business and less on the technical aspects. That is the final manifestation of the data storing process ie. the process of finding hidden trends, models, principles and relationships between data. These days it has been perfected to extract data into sub-areas of the text (*Text Mining*), Web (*Web Mining*) or organizing data in time series. In the evolution from business data to business information and knowledge, each new step is built on the previous one. With expansion of the use databases and dynamic new approach to research data (*Data Exploration*), the large amounts of data are leading to hidden data, which are important for getting new information and knowledge discovery, based on existing data and creating a new business value. In this sense was developed a concept of BI (*Business Intelligence*) as an architecture and the collection of integrated operational applications, decision-making support and databases applications, enabling easy access to data in business systems.

As a set of new application, BI has the ability to organize and structure data on business transactions in a manner that enables the analysis useful for decision-making and operational activities in the company. Davenport, De Long and Beers (1998) have distinguished the warehouse of external knowledge, such as stored competitive intelligence, and demographic or statistical data, from other public data sources and internal storage with informal information, such as transcripts of group discussions, emails or other forms of internal communication. Internal knowledge warehouse has less restrictive or formal structure in order to successfully adjust its subjective knowledge content.

Zack (1999) has classified the warehouses based on the content type, namely: *general knowledge* (eg. published scientific literature) and *specific knowledge* (knowing the local context of the organization). This distinction is very useful because the knowledge re-users should be aware if the knowledge credibility derives from the general or common knowledge, or was it discovered by their colleagues. This makes sense in the distribution of global knowledge warehouse along similar lines. Attention should be paid to the role of mediator who needs to develop and maintain the corporate memory of the organization. The authors of content are vital for the successful implementation of knowledge reuse as storage place. There are several methods that enable an individual to apply knowledge being a knowledge user models the task. Here is important to adjust the knowledge content to the requirements and performance of employees. EPSS and Bloom's taxonomy of cognitive, affective and psychomotor skills are good resources that provide learning and support to knowledge workers, who apply their knowledge and optimize its correspondence between needs of users and content that should be applied. The organizational architecture of

KM needs to be designed, developed and implemented in order to facilitate the application of knowledge at the organizational level. Reuse of knowledge is a good tool of management and conservation of valuable content in systems of the organizational memory management. Knowledge support systems can help in the use and reuse of organizational knowledge through particular forms of knowledge warehouses or Internet applications.

#### 4. INNOVATION OF THE KNOWLEDGE PROCESS

The possibility of improving and innovating the knowledge processes in the company assumes a dynamic approach to changes ie. the elaboration of dynamic the knowledge models and integration with business processes. Knowledge is an activator of economic development. The ability to invent and innovate, ie. to create a new knowledge and new ideas, embodied in products, processes and organizations, is the main engine of development. There have always been organizations and institutions dealing with the creation and dissemination of knowledge. However, the knowledge economy offers a lot more possibilities. The point is to increase the speed of the knowledge creation, accumulation and devaluation in relation of actuality and value. This trend, among other things, has reflected through the rapid growth of scientific and technological progress. This has had some consequences, initiating new challenges. Today, a new type of organization follows the new phenomena related to knowledge, namely: communities based on knowledge, ie. network individuals trying to create a new knowledge and put it in circulation.

Many scholars (eg, Drucker 1995) have argued that knowledge was one of the very few sources of sustainable competitive advantage and that the knowledge management application weakens the power of a group, organization, or even at the company level (Davenport and Prusak, 1998). According to Brown and Duguid (1998; 1999) knowledge is transferable entity (such as electric energy, fluids, cargo), which causes the phenomenon of knowledge conceptualization as the flow. Research in these works are based on the current theory, which refers to the knowledge flows, with focus on its dynamics, and supporting the improvement of design processes. A good understanding of the knowledge process, extends the theory, leading to a more comprehensive approach to the process of knowledge innovation. Synthesis of the different approaches to KM

allows extracting four dimensions, analyzed in the most discussions: a) *time*, as a linear and simplified representation of cognitive processes, including: mapping, adoption, codification, storage, use and transformation of knowledge and its elements b) *type*, referring to tacit and explicit knowledge, c) *level*, referring to a variety of social welfare aggregation d) *context*, which refers to finding the meaning, so the knowledge elements would not contain any meaning outside given context.

KM has always been rooted in the individual and his behavior, and the formalization of the area has been directed towards the systems and structures that provided incentive to the production, transfer, use, and re-invention of knowledge in the company. That orientation was largely caused by information technologies, enabling communication one-one, one-all and all-all. Innovation has become a dominating activity, whose sources that vary more than ever. Additional reflections in applying the role and importance of innovation is the increase of the speed at which they arise. There are two main methods that lead to new innovation breakthrough: *first*, through formal research and development outside the Internet connection *offline* (ie, isolated and protected from the usual provision of goods and services), and *second*, through learning via Internet connection - *online*, where individuals can learn and, as a rule, to estimate what they learn, improving their skills for the following activities. That can be very convincing form of knowledge production when it comes to many professions. Meanwhile, the need for innovation becomes larger as innovation itself becomes the only tool for survival and prosperity in a highly competitive and globalized economies. For the purposes of this manuscript, the literature on KM has been summarized in four key concepts: hierarchy of knowledge, information technology, systems based on knowledge, and life cycle of the management knowledge process.

Four major areas of knowledge (SECI) must be continuously improved in the company based on knowledge. Improvements can be achieved through information technology, systems based on knowledge and re-modeling of the management life cycle. A very important step in the process of creating new knowledge is conceptualization of the knowledge hierarchy, information and data (Davenport and Prusak, 1998, Nissen 2000; Von Kroug et al., 2000). Each level of the hierarchy is built on a level that is below it. For example, data are necessary to produce the information, but information include more than just data (eg, data must exist within the context). Similarly, information is necessary to produce knowledge, but knowledge involves more than information itself (eg, it enables action).

When it comes to knowledge processes, the knowledge hierarchy is the basis for placing the information technology at the right place. Modern information technology, used to support knowledge management, is limited primarily to the conventional management system - *Database Management Systems*, *Data Warehouses* and data research techniques *Data Mining*, internal network / business community network (*intranets / extranets*), web portals, focus group process (*Groupware* - by O'Leary, 1998). When separately analyzed, the word 'data' in the context of many 'tools of the knowledge management' (eg, DBMS, DW / DM), the problem is insufficient activity at the level of information, and much less on the level of knowledge. Although Internet network provides ordinary, independent mediator for distributing and linking of multimedia documents, actual *intranet* (internal network) and *extranet* (business community network) applications are directed primarily towards the management and distribution of information, and not towards knowledge in particular. This is the reason for the use of knowledge based systems.

The creation and use of *knowledge-based systems* can make knowledge to be explicit and its use to be direct. Primary KBS technologies include following applications: expert systems and intellectual factors, infrastructure and supporting resources, such as ontology, knowledge bases, activators, algorithms, leaf and logic programming languages and variety of representative formalisms (eg, rules, frames, sheet models , semantic networks). In a greater extent, KBS systems are based on winning, formalization and use of domain knowledge. Previous considerations have an important impact on the knowledge process design and its interaction within the organization.

Conceptually, there are three organizational flows: physical flow, information flow, and knowledge flow. All of them interact dynamically, as time progresses. Knowledge moves in cycles with time. Nissen et al. (2000) discuss the sense of process flow or life cycle, which is associated with the management of knowledge. After a complex review of the literature (eg. Despres and Chauvel, 1999, Gartner Group, 1999; Nissen, 2002), so-called "*merger model*" of knowledge management life-cycle is complete because it consists of six phases: learning, knowledge organization, knowledge formalization, knowledge delivery, knowledge use, and knowledge development. The knowledge processes should interact with the physical and information processes. Infrastructure of information technology can support such interaction. The knowledge processes must be optimized and designed to maintain the dynamics of the whole company. The companies should recognize the importance of mutual interaction, willing to incorporate a mechanism that enables it.

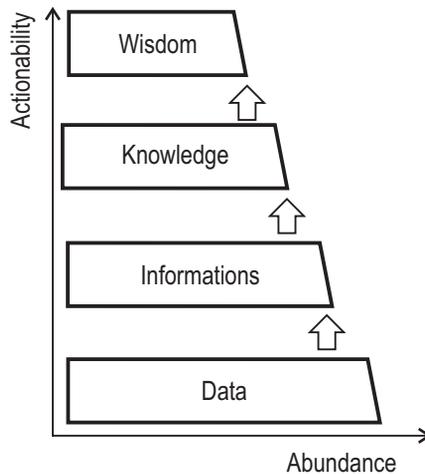
The whole process of knowledge building and rebuilding should be divided into several dense concentrated processes. Each theme design must be in a function of knowledge positioning as the most important company asset. Significant integration of knowledge management and innovation process is viewed as the current progress, until the companies understand the direct link between knowledge management and innovation as a result of the knowledge working process (Davenport et al., 1998). In scientific work that makes more than thirty KM actions, Davenport et al. (1996) note that the practice has “*fundamentally changed the management of projects.*” The newly created theory of knowledge creation and management has, in a dynamic sense, very oriented process (see Nonaka, 1994). Ruggles (1998) suggests that the primary goal of the practice should be accessing the knowledge management as a process, because it is fundamentally important for innovation. However, tedious, costly innovation, prone to “*first wave*” (Cypress, 1994), including IT in the process, do not guarantee the performance improvement. Many successful and effective companies experience degradation in the innovation application process (Caron et al., 1994; Hammer & Champy, 1993). Hammer (1990) has vividly explained this practice as “*automation of disorder.*”

According to Leavitt (1965) and others (cf. Davenport, 1993; Nissen, 1998), the new IT should be included in the design process it supports. In addition to technology, organizations, people, procedures, activities, and other key factors must be considered. Given that many KM projects involve IT implementation (eg, internal network / business community network - *intranets/extranets*, Web portals, targeted group process - *groupware* - Nissen et al., 2000), innovation process and knowledge management process seem to share some repeating errors. Based on these studies, there is a strong interaction between the work flow and the knowledge flow within organization. According to Oxendine and Nissen (2001), these flows are horizontal and vertical processes. In short, two horizontally oriented graphs are presenting two separate examples of the work process (steps are marked in a particular point of time, location and organization).

A graph on top of the Figure 3.11 presents the first example of this preliminary process (derived in one point of time, location and organization), and graph at bottom presents the second example (derived in another point of time, location and organization). Both horizontal graphs represent the *workflow* of the company. Besides that, it is necessary to present the information flow, as a conceptualization of work processes and the knowledge flow (Nissen 2002). Vertical graph is additional set of processes responsible for the information flow and knowledge flow. Knowledge is not equally distributed within the company,

so the company performances depend on consistency and effectiveness of the various workflows. Related knowledge (eg, procedural process, the best practices, selection of resources and their use) is flowing through time, space and organization. The process of intersecting activities leads the knowledge flow in the opposite direction from the workflow. Indeed, Nissen and Espino (2000) have identified seven vertical processes (eg, training, staff mission, IT support) interacting in a more complex way, which is not a reflection of a simple, linear flow shown in Figure 3.12.

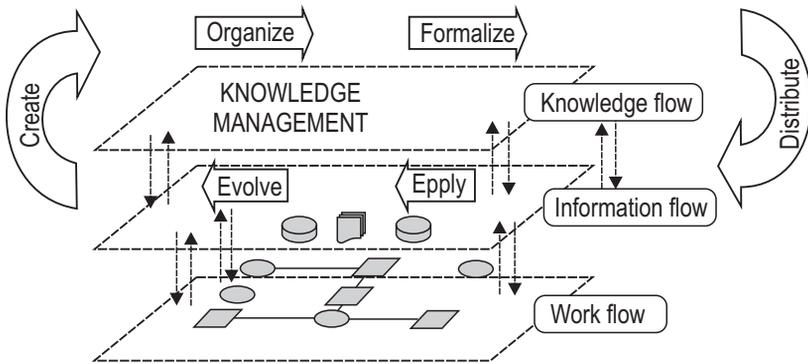
FIGURE 3.11:KNOWLEDGE HIERARCHY



Source: Adapted from Nissen 2001, p. 3.

Knowledge is expertise, experience, know-how, skills and competence. The knowledge processes are synergetic symbiosis of management, organization, business processes and information technology. Traditional organizations have neglected the knowledge processes. Today, many organizations are facing old, inefficient ways of knowledge creation and re-creation, trying to re-conceptualize business processes and knowledge as its main process. Successful outcomes are rare, and that is a fact.

FIGURE 3.12: KEY ELEMENTS OF KNOWLEDGE BASED ENTERPRISE



Methodology of knowledge creation is recommended in following steps: analysis of the existing knowledge process, defining the innovation strategy, mapping the individual and organizational knowledge, re-modeling of knowledge process and other processes, and implementing the new knowledge processes. Improving the knowledge management assumes a holistic approach and complex efforts in every organization, more or less. Knowledge is intangible asset. It can be transmitted and distributed throughout the organization. Implementation of methodology that emphasizes dynamism is strongly recommended. Dynamics is the main feature of the knowledge process, especially of those who create a new knowledge and innovation (cognitive thinking). Design of knowledge process and its interaction should be fundamentally based on dynamics. In conclusion, success of the modern enterprise depends on timely effective knowledge flow throughout the organization. Knowledge is not evenly distributed in the enterprise, so the knowledge flow must be timely and effective established by implementing new processes. Several well-known theoretical models of knowledge support the innovation of knowledge processes.

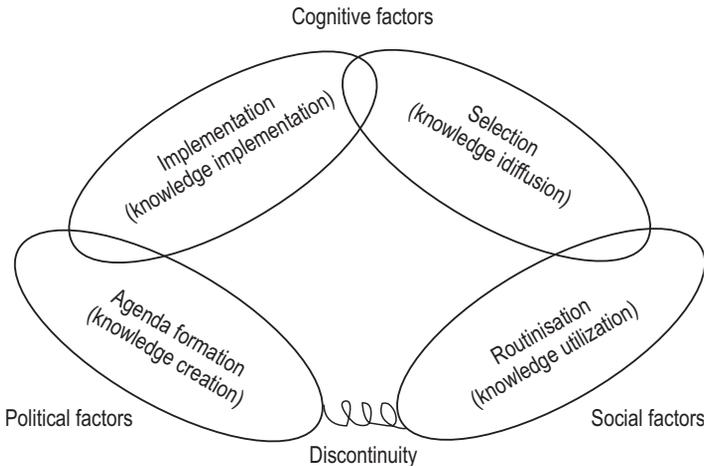
The practical research shows that the innovation of knowledge processes is achieved by trial and error, which proved to be the most effective method. The research described in this paper is upgrading on existing theory and practice of knowledge management, with attempts to extend it in some parts, especially in integration of knowledge flow into coherent processes. Supporting broader understanding of knowledge flows, we want to contribute to the creating of "instrument" which would be used in the field of knowledge process innovation

across the organization. The result is improvement of the current practice of process innovation. This model can be used, and vice versa, and it can be seen as a ground for designing of information systems and business processes. Differentiating the knowledge flows, information flows, and the complementary flows in the company, we have identified the important dynamic, which should be a framework for the formulation of a methodology for the quality knowledge management.

**Box 20 - Innovation processes and knowledge processes**

There is not much research to date that empirically links innovation processes to knowledge processes. Knowledge creation is one of the knowledge processes that may support innovation processes. Knowledge creation is perceived as one of the major assets of innovative organizations, and innovative organizations are defined by knowledge creation (Merx-Chermin and Nijhof 2005). Jashapara (2004) combines the management of innovation processes with knowledge processes in a conceptual model (see Figure B25).

FIGURE B25: EPISODES IN THE INNOVATION PROCESS



Jashapara distinguishes the following innovation processes: agenda formation, implementation, selection and routinization and links these innovation processes respectively with knowledge creation, knowledge implementation, knowledge diffusion and knowledge utilization. He does not

elaborate on the interaction of these innovation processes and knowledge processes but argues that tacit knowledge is more important in the first stage of knowledge creation and agenda formation. Explicit knowledge is said to be more useful in the final stages of knowledge utilization and routinization. This may be explained by the fact that the final stage parallels the codification strategy where knowledge codification, storage and retrieval mechanisms are developed (Jashapara 2004). Others argue that tacit knowledge is more important for innovation than explicit knowledge (Senker 1993; Swan, Newell et al. 1999). According to Senker (1993) the complexity of systems is the most common reason for the importance of tacit knowledge for innovation.

The management of tacit knowledge requires processes of personal interaction. Therefore socialization strategies (Nonaka and Takeuchi 1995) and personalization strategies (Hansen, Nohria et al. 1999) should be used to optimize knowledge processes and consequently innovation processes.

*Source:* Verburg & Hoving 2007, adapted from Jashapara, 2004.

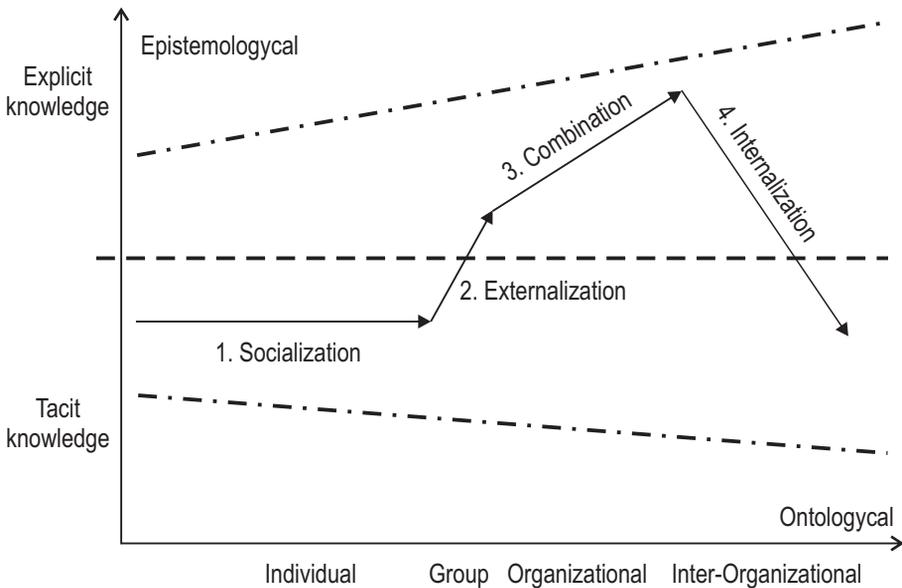
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## 4.1 The Knowledge Flow and its Dynamics

One of the most popular approaches to *knowledge flows* is by Nonaka (1994) in terms of organizational learning. Two dimensions of knowledge have been considered: epistemological and ontological. Epistemological dimension reflects the binary contrast between explicit and tacit knowledge. Explicit knowledge can be formulated through artifacts, such as books, letters, manuals, standard operation procedures and instructions, whereas tacit knowledge contains more understanding and expertise in human mind. Ontological dimension reflects the knowledge that is shared with others in a group or larger aggregation of people within the organization. Although this aggregation of organizational units seems arbitrary, in the context of the company, it can be clearly applied in small teams, workgroups, departments, business units, companies, business associations and networks. As shown in Figure 3.13, Nonaka uses interaction between these dimensions as the principal tool for describing the knowledge flow. This flow has been roughly shown in four steps. First, Nonaka argues that new knowledge is created only by individuals in the organization and that it is, by nature, necessarily tacit knowledge. In theory, the first knowledge flow is going through a process called socialization, pointing to the team members who share the experience and observation; individual should participate in communities and practice. The course of socialization is represented as a vector 1 that

corresponds to tacit know-ledge (ie, includes the epistemological dimension), ranging from the individual to a group level (ie, includes the ontological dimension - Nissen, 2002). Another knowledge flow (vector 2) on theory basis, occurs through a process called externalization and that means the use of metaphors in dialogue. It leads to the removal of tacit knowledge and next formalization into concrete and explicit. The third flow of know-ledge (vector 3) on theory basis, occurs through a process called combination. It points to the coordination of different groups within organization, along with documentation of existing knowledge, in order to combine new internal team concepts with other, explicit knowledge within organization. The fourth flow of knowledge (vector 4) on the basis of theory, occurs through a process called internalization. Internalization points to a various members of the organization, including the above combined knowledge, often through trial and error - and vice versa, transferring this know-ledge in the form of tacit knowledge at the organizational level.

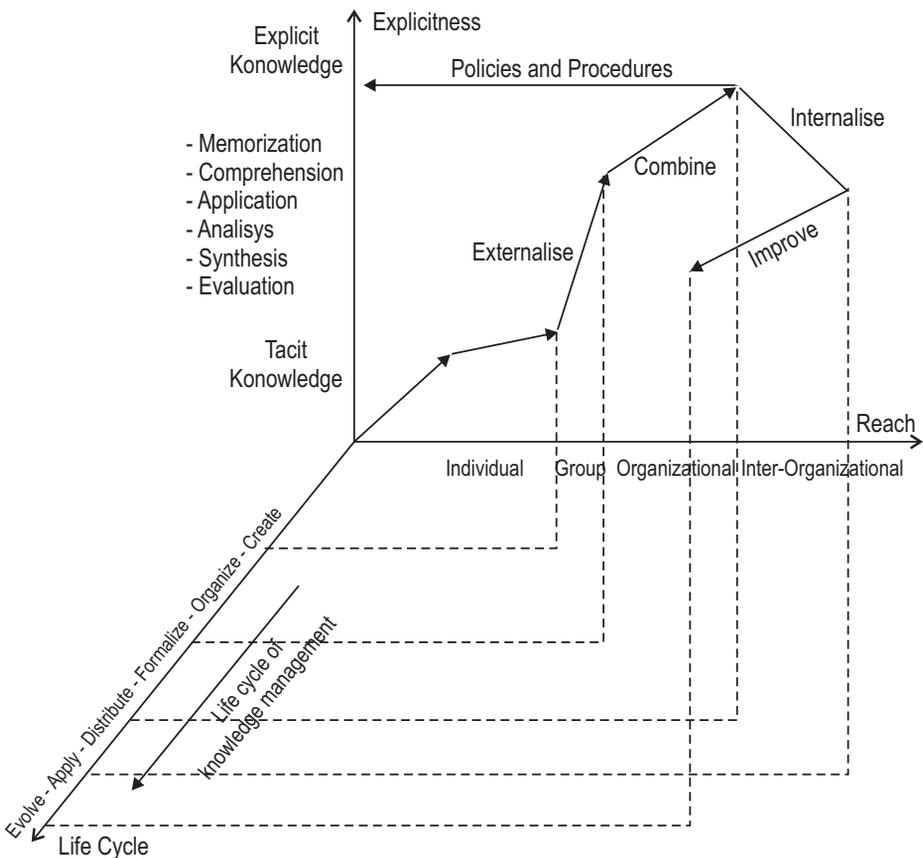
FIGURE 3.13: NONAKA KNOWLEDGE FLOW THEORY



Source: Asapted from Nonaka,1994; Nissen, 2001.

The creation process of new knowledge requires an understanding of the knowledge flow. This section is built on the aforesaid understanding of Nonaka and Nissen’s models, related to dynamics of the knowledge flow. This section can help better description and explanation of moving the knowledge through the enterprise. The first step to upgrading the existing theories of the flow of knowledge is the extend of Nonaka’s dimensional framework, including the third dimension, the knowledge management lifecycle.

FIGURE 3.14: EXTENDED MODEL WITH KNOWLEDGE FLOWS



Source: Nissen 2001, p. 19.

Nissen has operationalized the form using the life cycle stages of the *merger model* (Nissen, 2002). Furthermore, because the concept flow is inherently dynamic, Nissen extends this framework by adding time as the key fourth dimension. This increased dimensionality extends Nonaka's two-dimensional framework and provides the basis for more complex models. More complex model can increase our ability to describe and exposure in terms of understanding the knowledge flow phenomenon.

In Figure 3.14 we see several meaningful vectors of the knowledge flow and classification of the different dynamic forms of knowledge that moves through the company. For example, simple rectilinear flow, marked as "rules and procedures", reflects how the most companies inform and perform the training of employees, using these rules and procedures. The explicit documents and guidelines, used by individuals within the organization, are expected to be remembered, used and had in mind. Another example, the cyclical knowledge flow, described by joint KM life cycle model, as shown in the figure 3.14, reflects the complex dynamics of a simple, linear antipode. Mentioned flow represents the cycle of knowledge creation, knowledge transmission and knowledge development within the working group.

Furthermore, Nonaka's dynamic theory of knowledge flow can be described in the space by curvilinear vector sequences that correspond to individual processes, called "create", "socialize", "externalize", "combine" and "internalize". For this purpose, the model contains what Nonaka has proposed, reflecting the complex dynamic of the knowledge flows along with the life cycle. Moreover, analysis of this area indicates the inclusion of more meaningful vector, which is not a part of Nonaka's theory, but a key element of empirically derived model of *mergermodel* (ie, the key of skills evolution). It is clear that many other trends and forms could be displayed this way. Nissen has included the time dimension in the current model, because the static views can hardly visualize more than three dimensions.

# SUMMARY

It has been long since the economic reality has been enriched with many contents which has created the new epoch of pluralistic economic synergetic. Economic science has made great efforts to explain phenomena of the new epoch. With creation, and using of new knowledge, it has contributed to evolution of complex, dynamic, open and virtual business systems based on the principles of flexible self organization, equal partnership cooperation and limited autonomy. Today, more than ever before, knowledge is the driver of competitive advantages of companies, state power, economic growth, and development. However, many countries have a poor starting position, which requires their additional, and much greater attention to the development today's most important, and the only unlimited resource. They must resolutely fight with many obstacles that accompany them in the creation, transfer, and management of knowledge, ranging from institutional, cultural, economic and political, which are evident not only in the countries in transition, but also in all the economically backward countries.

It is evident that the economic and state power essentially reflects through the competition of the levels of knowledge. This book is devoted to a review and elaboration of the leading theoretical and methodological conceptions of knowledge. This is our attempt to contribute to the efforts for enhancing the ability to achieve an efficient, concurrent and sustainable use of knowledge. The book treats a number of significant issues related to the knowledge and its management in modern business. Starting from the undisputed findings that success, stability and sustainability of modern firms and corporate governance are predominantly influenced by the abilities of acquisition and use of knowledge and its functional orientation towards continuous innovation, the aim of this book is to offer a systematic and conceptually original view of the relevant knowledge available, which analytical and methodological points to its paradigmatic. During many years of an extensive research of the key areas of knowledge, from different perspectives, we realized that the special quality of this social and economic resource is precisely its paradigmatic nature. Historical and comparative analysis of the relationship of knowledge paradigmatic and institutional development confirmed the general conclusion their strong correlation...

Fundamental and applied science have always been creating knowledge and changing the world for the better. However, with the increasing complexity of the world, especially during last three decades, the domination of knowledge has been increased in all spheres of human activities. The significance of knowledge as a key element of the economy of knowledge increasingly exceeds the significance of the market of material flows and enhances the role of effective knowledge management. Furthermore, information, and knowledge are conceptual resources, which are fundamentally different from material resources, since they allow management of all other resources.

The sustainability of any business depends on the knowledge, its using and continuous improvement. This is an additional reason for the acceptance of the idea of paradigmatic knowledge, which contains a paradox, because the increase in its quantity increases the speed of its obsolescence.

Knowledge management is growing in popularity, and is being implemented within many organizations as an effective strategy in improving corporate business practices. All successful organizations focus on knowledge as a key resource of intellectual capital. This contributes to finding answers to new market challenges and opportunities. Change in management styles was an introduction to the management of *Fifth Generation* (Charles Savage), *The Fifth Discipline* (Peter Senge) and *Intelligent Enterprise* (James Brian Quinn). Their unequivocal managerial perspectives paved the way to new management thinking, including: cocreation, dynamic teaming, knowledge networking, the learning organization, and organizational strategy revolutionization into intelligent enterprises.

New economy, based on knowledge, implies the existence of modern flexible organization which reacts immediately to changes in its surrounding. Only those organizations that are able to adopt changes, create changes, change them, learn and specialize constantly, continually create new products and/or value added services and innovations may survive and sustain for the long term. Such an approach implies the following:

- Focusing on knowledge,
- Existence of certain technological infrastructure in organization (such as, the existence of developed information system),
- Constant reviewing of its own business,
- Willingness to frequent reorganization of business, and reengineering of business processes, and

- Adopt of changes with real needs.

The transition to the knowledge economy is characterized by several significant steps: information becomes the most important resource, and information-communication technology has become the basic infrastructure of the business. Today, the main key factors imposing conditions of business are customers (final customers) selecting only the highest quality and innovative products having been embodied the new knowledge into.

The subject of our research is the explanation of the main modern development tendencies in the field dominated by knowledge and affirmative relation towards it: new economy, economy of knowledge and knowledge management. It is about the civilization and paradigmatic step and phenomenon deserving the comprehensive consideration. This manuscript indicates:

- Growing role and importance of knowledge for creation of competitive advantages within modern conditions of fast changes and growth of uncertainty, as well as for social and economic development,
- Imperative necessity of its maximal forcing and widest application, at all levels and all segments of a society,
- The necessity of constant learning, specialization and adoption of the new knowledge,
- The importance and paradigmatic of knowledge,
- Gradational connection of new economy, economy of knowledge, and knowledge management,
- The fact that “knowledge is power” but only within the institutionalized environment, and
- The need of critical attitude towards the quasi knowledge.

From the methodological aspect, the book is based on data, attitudes, researches and analyses of the world’s most famous authors as regards the multidisciplinary area such is the knowledge. It has enabled us to form the basic starting hypothesis as follows:

*The dominancy of knowledge and its importance in the modern society and economics substantially determine the competitive capacity at the national and corporate level, and more and more is the main factor of determination and success of development vision, strategies, and appropriate policies at the micro*

*and macro levels. As well as two auxiliary hypotheses, first: For the development of knowledge, besides investments and other factors of influence, developed and stable institutional conditions are required, and second: The paradigmatic of knowledge has led to its revolutionary creation i implementation at all level of economic, politics, and social realities, and new phenomena in the economy called new economy, knowledge society, and knowledge economy are result of its essential characteristic – the paradigmatic.*

By selection of relevant scientific attitudes, their classification, functionality and comparative analysis we have conducted, offered conclusions and adjusted graphical modelling, we have tried to verify the stated hypothesis. The manuscript is structured in the three parts making the compact whole and logical sequence in historical, research and methodological aspect. Reviewing the knowledge paradigm starts with characteristics and phenomena of new economy, society of knowledge, and network economy, further spreading to economy of knowledge and its the most significant determinants (knowledge, innovations, intellectual, and social capital) ending with complex and numerous aspects and models of knowledge management.

The aim of the manuscript is to be the guide mark for all relevant social structures, activities and levels to the necessity of unconditional acceptance of knowledge paradigm as a development imperative in all social and economic areas. It clearly warns that any ignoring, bypassing and substitution of knowledge shall lead to obliquities named crisis and delays in development. It should provoke the attention of new researchers and motivates them to constantly deepen knowledge, improve, expand, develop and scientifically shape in many understated aspects.

We have tried this book to be our humble contribution to the ode of knowledge.

# INDEX

- Abramovitz, M. 7  
 Ackoff, R. 88, 89  
 Akerlof, G. 44  
 Allais, M. 18  
 Altshuller, G. 193  
 Amidon, D. 32, 137, 184  
 Araujo, L. 123  
 Argyris, C. 202, 203, 205, 206  
 Atkinson, R. 6  
 Arrow, K. 34, 92  
 Audretsch, D. 47, 48, 50, 115  
 Aune, A. 5, 164  
 Award, E. M. 180
- Bacon, F. 78, 83  
 Barancev, V. 200  
 Bell, D. 2, 5, 28, 86  
 benchmarking 70, 71, 170, 185  
 Bar Hillel, J. 35  
 Becker, G. 135, 136, 139  
 Beers, M. 225  
 Bjelic, P. 14  
 Bloom, B. 215, 216, 217, 218, 219, 221, 225  
 Bonfour, A. 136  
 Bontis, N. 136, 138  
 Bourdieu, P. 121, 132, 165  
 Brooking, E. 136, 140, 141, 149, 157, 193  
 Brown, J. 226  
 Brynjolfson, E. 6  
 business intelligence XI, 167, 168, 225  
 Byron, G. 81
- Cangelosi, J. 202  
 Cantrell, S. 159  
 Carayannis, E. 189  
 Caron, J. 229  
 Castells, M. 5, 17, 31, 73, 74  
 Champy, J. 229
- Chauvel, D. 228  
 Chandler, A. 3, 6, 47, 48, 49  
 choice 2, 9, 13, 17, 18, 21-27, 34, 35, 42, 62, 92, 162, 207, 218  
 civilization XII, XV, 1, 13, 19, 20, 21, 30, 63, 71, 77, 79, 80, 84, 87, 239  
 Clark, D. 14, 34, 104  
 clusters 47, 63, 64  
 Coase, R. 41, 44, 48, 212  
 Cohen, W. 215  
 Coleman, J. 121, 129, 133  
 competencies VII, 2, 26, 52, 56, 68-71, 105, 141, 143, 145, 146, 150, 157, 159, 169, 176, 177, 192  
 comparative advantages 3, 171, 213  
 Compain, B. 34  
 competition 1, 2, 5, 8, 9, 13, 14, 16, 17, 22-26, 28, 36-39, 46, 47, 49, 50, 51, 53, 56, 58, 59, 63, 64, 66, 68, 78, 90, 97, 99, 100, 101, 116, 121, 137, 145, 167, 175, 180, 205, 212, 214, 223, 237  
 competitiveness 1  
 communication technologies 4, 9, 37, 42, 51, 63, 65, 77, 86, 162, 184, 211,  
 cooperation XI, 20, 22, 23, 32, 38, 40, 46, 49, 53, 55, 56, 64, 65, 66, 78, 105, 120, 121, 129, 133, 176, 178, 181, 184, 190, 219, 220, 237  
 core competencies VII, 70, 71, 146, 150, 176, 177  
 corporation 6, 26, 42, 49, 50, 65, 74, 93, 111, 138, 195, 211, 212, 218, 244  
 Court, R. 6  
 Cunningham, S. 83  
 customer knowledge 173, 174  
 Cyert, R. 202  
 Cypress, H. 229
- Daft, R. 36  
 D'Aveni, R. 212  
 Davenport, T. 80, 88, 176, 225, 226, 227, 229

- David, P. 6, 7, 137, 138  
 Davidov, W. 65  
 Davis, B. G. 35  
 De Long, D. 225  
 Despres, C. 228  
 digital products 27  
 Dinur, A. 196  
 Djordjevic-Boljanovic, J. 178  
 downsizing 177  
 Dragicevic, A. 20  
 Dragicevic, D. 20  
 Draskovic, V. X, 1, 17, 63, 117  
 Draskovic, M. 54, 63, 117  
 Drucker, P. 30, 82, 83, 92, 99, 138, 176, 184, 193, 226  
 Dryden, G. 193  
 Duguid, P. 226
- Earl, M. 171, 188, 189  
 Easton, G. 123  
 e-commerce 14, 19, 63, 86, 177  
 economic growth IX, X, 5, 9, 21, 22, 28, 31, 41, 78, 85, 90, 106, 116, 124, 133, 137, 166, 171, 175, 188, 211, 237  
 Edmonds, G. 219, 220  
 education IX, XV, 3, 5-7, 12, 28, 30, 35, 38, 40, 41, 64, 66, 67, 78, 81, 82, 86-88, 91, 92, 94, 97, 116, 117, 119, 121, 128, 137, 141, 155, 157-159, 162, 164, 165, 171, 182, 190, 194, 197, 203, 215, 216, 220, 222  
 Edvinsson, L. 136, 138, 140, 141, 156, 158, 185, 186, 192,  
 entrepreneurship 5, 16, 23, 34, 38, 84, 98, 157, 177  
 Espino, J. 230  
 explicit knowledge 97, 110, 136, 168, 169, 175, 179, 183, 193-196, 213, 223, 227, 233, 234  
 externalities 8, 26, 47,  
 externalization 192, 193, 197, 199, 234
- Feiwal, G. 139  
 Feldman, M. 47, 48  
 Fisher, R. 35  
 Fleming, N. 122
- Forrester, J. 203  
 Frid, R. 194  
 Friedman, M. 23  
 Friedman, T. L. 211
- Galbraith, J. K. 50  
 Ganesan, R. 219, 220  
 Gaponenko, A. 83, 160, 170  
 Gaston, R. 50  
 Gates, B. 176  
 Gay, L. R. 34  
 Gefter, M. 79  
 Ghaziri, H. M. 180  
 globalization IX, 1, 12-14, 18, 20, 27, 37, 44, 46, 47, 51, 63, 71, 72, 74, 77, 78, 82, 100, 102, 128, 171, 176, 190, 192  
 Gomes-Casseres, B. 49  
 Gompers, P. 50  
 Gordon, R. 7  
 Greif, I. 116, 219  
 Grey, D. 80
- Hallgren, M. 33  
 Hamel, G. 109, 138  
 Hammer, M. 229  
 Hartley, R. 35  
 Hayek, F. 9, 116  
 Hawken, P. 5, 30, 31, 83, 164  
 Hedlund, G. 195  
 Hemingway, C. 176  
 Hicks, N. 126  
 Hintikaka, J. 35  
 Hitt, L. M.  
 Hope, J. 157  
 Hope, T. 157  
 human capital 3, 39, 63, 77, 78, 84, 115, 121, 122, 128, 132, 135-143, 148-150, 152, 154, 155, 157, 159, 160, 166, 170, 192, 196
- Ilic, B. 22, 28  
 Ilintch, A. 212  
 implicit knowledge 136, 137, 168  
 information asymmetry 43  
 information infrastructure 3, 10, 56, 64, 86, 211,

- information services 21, 35-37, 86  
information society IX, 1, 14, 21, 28, 30, 67, 79, 91,  
innovations 2, 5, 6, 14, 27, 47, 51, 54, 63, 64, 97, 98, 100-104, 114-119, 149, 154, 174, 192, 238, 240  
Inmon, B. 223  
Inkpen, A. 296  
institutional pluralism XIV, 41, 116, 124,  
Inozemcev, V. 33  
institutional development 116-118, 237  
institutionalism 8, 24  
tangible assets 111, 140, 201,  
intangible capital 4, 70, 75, 78, 79, 111, 138, 139, 141, 147, 152, 154, 155, 158-161, 166, 170, 175, 187, 201,  
intellectual capital XV, 4, 5, 38, 68, 70, 71, 78, 114, 135, 138-151, 153, 154, 156, 159, 161, 162, 163, 168, 172, 176, 184, 186, 193, 196, 197, 238  
internalization 5, 7, 10, 14, 85, 87, 107, 138, 140, 141, 144, 145, 149, 150, 157-160, 192, 193  
intra-corporate exchange 2, 9, 13, 14, 19, 23, 26  
Itami, H. 136, 137
- Jaffe, A. 47  
Jaksic, M. XVI, 24, 26, 268  
Jevons, W. 46  
Johnson, B. 89, 91, 160, 161  
Jones, C. 176  
Jorde, T. 50
- Kaplan, R. 138, 151, 185  
Kecmanovic-Cecez, D. 165  
Keilbach 115  
Kelly, K. 4, 6, 30, 32  
Kendrik, J. 136  
Kemeny, J. 35  
Keynes, J. M. 18, 23, 24  
Kimball, R. 223  
Klein, D. 113, 136  
Kling, R. 219  
knowledge flow V, VII, 92, 94, 95, 174, 228-236  
knowledge society I, VII, X, XIII, XV, 4-16, 28, 63, 67, 81, 82, 171, 176, 240  
knowledge spiral 199, 213
- Kogut, B. 188  
Kolmogorov, A. 35  
Kolakovic, M. 158  
Kotlica, S. 14  
Koulopoulos, T. 168  
Krathwohl, R. 215  
Krishna, A. 121  
Krsmanovic, S. 174  
Krugman, P. 46  
Krugman, P. (1991), "Increasing Returns and Economic Geography," *Journal of Political Economy*, University of Chicago Press, 99(3), 483-499.  
Kuhlthau, C. 215  
Kuhn, T. 20
- Lane, R. 5  
Levinthal, D. 215  
Lewin, A. 212  
Li Tein 1  
Loasbi, B. 26  
Lukas, R. 136  
Lundvall, B. 89
- Machlup, F. 5, 14, 35, 83, 86  
Makarov, V. 166, 169  
Malhotra, Y. 179  
Malone, M. 65, 136, 138, 140, 141, 156, 158, 185  
Malthus, T. R. 17  
March, J. 202  
Marinko, G. 171  
market failure 26, 41  
Marks, K. 136  
Markus, M. 222  
Martin, W. 33,  
Marshall, J. 84, 220  
Masic, B. 170, 178  
McAdam, R. 194  
McCready, S. 194  
McLuhan, M. 4  
Meljancev, V. 166  
Menger, C. 46  
Mesia, B. 215  
Metcalf, B. 53

- Meyer, C. 90  
 Mill, J. S. 136  
 Mil'ner, B. 155
- Naisbit, I. 21  
 Nakamura, I. 46  
 Narayan, D. 124  
 Nelson, P. 136, 137  
 network goods V, 8, 14, 15, 33,  
 network economy I, 27, 51-58, 68, 240  
 Nissen, M. 227-231, 234-236  
 Noland, M. 50  
 Nonaka, I. VII, 87, 97, 110, 136, 138, 185, 192,  
 193, 197, 199, 219, 229, 233-236  
 North, D. 44, 45, 116  
 Norton, D. 138, 151, 185  
 Nooteboom, B. 48  
 Noyelle, T. 5
- Okuno-Fujiwara, M. 50  
 Olson, M. 48  
 Onge, H. 138, 186  
 organizational capital 140-143, 157, 170  
 organizational learning IV, VIII, 175, 189, 201,  
 202, 205-207, 209-213, 220, 233  
 organizational knowledge 97, 114, 168, 172, 177,  
 185, 189, 190, 196, 201, 210, 215, 220, 221, 226,  
 231,  
 organizational structures 6, 53, 56, 170, 211  
 Orlova, T. 83, 160, 170,  
 outsourcing 105, 111, 164, 177, 199  
 Oxendine, E. 229
- Pareto, V. 22.  
 Pastuovic, N. 7  
 Pejovich, S. 42, 44, 45  
 Peters, T. 99  
 Petrovic, P. 99, 100  
 Pisano, G. 212  
 Pokrajac, S. 98  
 Porat, M. 5  
 Porter, M. 63, 64, 99, 175,  
 Portes, A. 132, 133  
 Poster, M. 34
- post-industrial society 1, 5, 21  
 Prahalad, C. 138  
 Prusak, L. 80, 88, 176, 226, 227  
 Pugel, T. 50  
 Puskas, R. 220  
 Putnam, R. 120-122, 129, 133
- Rajss, M. 52, 56  
 Rashevsky, N. 35  
 Ranson, S. 5  
 Robbins, L. 17  
 Rolf, V. 53, 55  
 Romer, P. 5, 46, 85, 136, 137, 175  
 Roos, G. 68, 149, 155, 156  
 Rose, I. 204  
 Rossett, A. 220  
 Rosenberg, N. 6, 113  
 Ruggles, R. 112, 183
- Savage, C. 138, 238  
 Scarborough, H. 6  
 Schoetze, G. 92  
 Schön, D. 202, 203, 205  
 Schotter, A. 42  
 Senge, P. 138, 161, 184, 193, 203, 205, 209,  
 210, 220, 238  
 service society 58  
 Shannon, C. 35  
 Shapiro, C. 7, 16, 59, 61, 85  
 Show, B. VIII, XIV  
 Shuen, A. 212  
 Shults, T. 136  
 Shumpeter, J. XV, 29, 136  
 Simon, H. 135, 136  
 Smith, A. 46, 77, 136, 139, 158  
 Snowden, D. 196  
 social capital IV, VI, VII, VIII, 15, 75, 120, 121-  
 135, 165, 240  
 socialization 172, 189, 192, 193, 197-199, 233  
 Spector, J. 219, 220  
 Spinello, R. 168  
 Spink, A. 215  
 Stanback, T. 5  
 Stankosky, M. 194

- Stephan, P. 47
- Stewart, T. 5, 107, 136, 138-140, 149, 154, 157
- Stiglitz, J. 43, 44, 50
- structural capital 115, 140-144, 148, 149, 152, 154, 155, 157, 159,
- Sullivan, P. 70, 136,
- sustainable development VI, IX, X, XI, 2, 8, 10, 16, 88, 115, 124, 163, 164,
- Sveiby, K. E. 68, 136, 138, 149, 155, 186
- synergy 29, 79, 120, 154, 179
- Sweetland, S. 139
- tacit knowledge 67, 85, 97, 110, 151, 169, 179, 183, 193, 199, 213, 214, 233, 234
- Takeuchi, H. 87, 97, 138, 185, 197, 219, 233
- tangible assets V, VI, 4, 70, 75, 78, 79, 111, 138-141, 147, 152, 154-161, 166, 170, 175, 187, 201,
- Tapskot, D. 32
- Taylor, F. 47, 120, 136
- technological progress 2, 7, 162, 226
- Teece, D. 47, 49, 50, 111, 137, 139, 212
- Tiwana, A. 89
- Tobin, B. VIII, 159, 162
- Toffler, A. IX, 21, 30, 63, 79, 92
- Toynbee, A. 20
- Trajtenberg, M. 6
- transaction costs I, 32, 40, 41, 44, 45, 56, 64, 105, 121, 166, 212
- transnational corporations 26
- Tsuchiya, S. 136
- Van Buren, M. 196, 197
- Varian, H. 7, 21, 34, 40, 41, 59, 61, 85
- Vercellone, C. 7
- Viig, K. 190
- virtual corporation 65
- virtualization 2, 3, 20, 23, 38, 63, 185, 267,
- Voss, J. 193
- Wallis, J. 45
- Walras, L. 46
- Webb, S. 215
- Weaver, W. 35
- Wells, R. 35, 184
- Wiig, K. 169, 191
- Williamson, O. 48, 116, 134, 212
- Winter, S. 136, 137, 181
- Woolcock, M. 124, 133
- Quin, J. 159, 238
- Zack, M. 255
- Zuboff, S. 6
- Zander, U. 188



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## REVIEWS

This paper outlines the differences between the “New Economy”, the “Knowledge Economy” and “Knowledge Management”. The authors thoroughly analyze the transition from one economy to the other and make a clear distinction among each of them. The authors emphasize the evolving nature of societies and the consequences of these changes from both technological and economic perspectives. The book serves as a guide for many dimensions of both current and future social structures. The authors center their thesis on the crucial need for what they call the knowledge paradigm. They warn that any substitution or neglect of knowledge may ultimately lead to delays in a society’s development, be it socially, economically, and scientifically. Knowledge is given an important designation at the start of this worthwhile manuscript. Innovations in technology are attributed to economic and social advances.

The author calls these innovations “knowledge revolutions”. They are: innovations in information technology, such as but not limited to computer network and telecommunication systems, employment structure. They assert that the labor force has become more focused in the private sector, leading to not only dominant production of goods, but also dominant production services. The introduction of the internet allows everyone easy access to an enormous number of markets and practically unlimited space for information, which is one of the attributes for the more general concept developed by the authors of knowledge. The new economy that is outlined in the first part of the book is also based on knowledge. It implies the existence of a modern flexible organization that reacts swiftly to changes in its surroundings. Entities that are able to adopt changes and continuously specialize will thrive in the long term. Some characteristics integral to the new economy are focusing on knowledge, having technological infrastructure in organization, continually reviewing the practices of their diversified businesses, and readily embracing changes. The authors describe the transition of the former economy to the knowledge economy by convincingly arguing that information has to be the most important resource, and information communication technology has to be the infrastructure of any modern business.

The knowledge economy is characterized by an imperative necessity of its maximal forcing and widest application, at all levels and all segments of a society. Incorporating this principle will lead to a greater increase in competitive advantages under conditions of constant change and increased uncertainty, due to their flexible structure which nature and maintain their ability to adapt. This in turn will spur social and economic developments, allowing countries to climb the growth ladder. Knowledge Keystone to Modern Economy provides unique insight on the unpredictable world of economics and society. The distinction between the economies of old and the new knowledge economies are made clear in this manuscript. The book systematically details the steps economies have taken to thrive in societies where changes are inevitable. Most importantly, the authors redefine what is considered to be knowledge. This new perspective is applicable in eco-

conomic, social and scientific settings, which truly make the book a useful tool for students, researchers and policy makers alike.

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Authors sent me for review text of the monograph "Knowledge - Keystone of the Modern Economy" with volume 300 pages, format 153 x 208 mm, font Arial, Pt 10. with boxes font Arial Narrow, Pt 9, which consists of the next parts: Contents, Preface, Part I: The New Economy (1. The Knowledge Society; 2. Paradigmatic of New Economy; 3. Old and New Economy; and 4. The Network Economy); Part 2: The Knowledge Economy (1. Paradigmatism of the Knowledge Economy; 2. Concept of Social Capital; and 3. Concept of Intellectual Capital); Part 3: The Knowledge Management (1. Concept of Knowledge Management; 2. Models of Knowledge Management; 3. The Knowledge Application; and 4. Innovation of the Knowledge Process); Summary; References; and Index. There are 20 boxes, 48 figures, 24 box figures, 23 tables, and 3 box tables in the monograph. The text is modern, written with high level of still, and balanced, with quality technical preparation. I know the authors of this monograph "Knowledge - Keystone of the Modern Economy" first of all the Professor Veselin Draskovic, for many years. They are very nice specialists in the modern economy and very nice scientists in the sphere of institutional economic theory. Professor Veselin Draskovic with coauthors explained their wide experience in preparing the good magazine "Montenegro Journal of Economics", and organizing the international conferences in Montenegro (in Kotor) for the preparing the materials for this new monograph.

This new monograph "Knowledge - Keystone of the Modern Economy" is devoted to the problem of knowledge application in economics. Here one may see many spheres of application and authors analyzed this spheres: new economy, society of knowledge and network economy. Also the monograph "Knowledge Keystone of the Modern Economy" was divided on several perspective sections. Growing role and importance of knowledge. The necessity of constant learning, the importance of knowledge, the connection between economy of knowledge and knowledge management, and other items discussed in the book. To my mind this monograph titled "Knowledge Keystone of the Modern Economy" will be the good handbook and scientific investigation for the scientist who lake part in the knowledge economy researches. With above listed characteristics, this monograph is the significant scientific text, and I propose it with great pleasure for publishing to the publisher SPH - Scientific Publishing Hub Celje - Osijek - Czestochowa - Kotor.

Professor Evgeny Popov  
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The motto of this valuable, interesting and innovative book is the view of Li Tieying, President of the Academy of Social Sciences of China, "*The soul of knowledge economy is constant striving for innovation, and the source of its power is education. In modern world, the power struggle between states is essentially a competition in the level of knowledge.*" This unbreakable and increasingly more important link between education, knowledge, innovation, and competitive advantage of nations is the subject of the book written by Veselin Draskovic, Radislav Jovovic, Mimo Draskovic, and Borut Jereb called Knowledge - Keystone of the Modern Economy.

After mercantilists have found the source of wealth in trade, the physiocrats in agriculture, classicists in material production, sources of the wealth of nations are now to be looked for in these intangible factors. The authors explain the determinant paradigmatic in the following way: "*We refer to fundamental economic theory that dominates a given time (period) of its development. A paradigm is based on a general idea or concept that finds its concrete expression in a) the initial or original concepts; and b) in the system of fundamental principles, laws, or sufficiently plausible hypotheses.*"

The three parts - the New Economy, the Knowledge Economy, and the Knowledge Management, illuminate the most important factors, their inter-dependence and mutual effects on the overall economic and social development of individual countries. In this book, the authors discuss the growing role of knowledge in creating competitive advantages in the modern conditions of uncertainty that impose the determinants of innovation, sustainability, inclusive institutions, supportive regulatory environment, continuous learning and acquiring new knowledge, investment in knowledge, the dissemination of knowledge, development of the existing and available knowledge as the imperatives.

The main idea of the authors of this book is that the dominant importance of knowledge decidedly determines the development strategies and respective policies at national and corporate levels, and that development of knowledge requires developed and stable institutional conditions. One of the authors of the book explains it in the following manner: "*Each stage had its own development paradigm with the corresponding criteria and values. They changed revolutionary. Each new historic period required (mainly pragmatic) a change in thinking and behavior. Generally, it has reduced down to adapting to civilized norms, achievements and challenges.*" Academic, scientifically based, tolerant and open comprehensive analysis characterizes general theoretical approach and a specific realistic analysis that enables the authors to explain important issues of modern society and economy comprehensively and thoroughly, without apriority and exclusivity. And the axis of knowledge - innovation - institutions - development is precisely that element which makes the distinction between the successful and the unsuccessful. The prosperous and the stagnant, allowing them the much desired climbing the global ladder of social and economic development.

Innovation and openness to new knowledge are embedded in new institutions and social order and have enabled England, unlike Spain, to use the Atlantic trade as an encouragement for the introduction of efficient economic, market, and democratic political institutions, unlike Spain and Portugal, which have not yet used this opportunity, and

which maintain the medieval order of the monopoly and the rule of non-productive elites. These important drivers of social and economic development are also explained by the authors when they write that *“In terms of knowledge economy, an almost unprecedented phenomenon occurred - an open virtualization of economy, its dematerialization and great independence from national borders. Economic, political, civil and social power in the world will no longer be determined merely by the amount of resources that a specific social group and/or nation possesses, its size and economic power. but the knowledge and skills to enrich its wealth and power most efficiently.”* This suggests and supports the key levers of social and economic development of countries. Instead of the Tyranny of Space and Place, the Westphalian notions of national sovereignty, countries and their leaders need to turn towards Prigozin’s and Wallerstein’s survival in the conditions of tolerance, or what Kenichi Ohmae described as Nothing is ‘overseas’ any longer,

In order to become the ‘knowledge society’, it must constantly learn. the authors indicate, pointing to the effect this has on the organization of companies and economy, the nature of institutions. The establishment of network relationships, the growing importance of incentive mechanisms of regulatory bodies which should encourage networking between stakeholders like a spider would create its web. The term New Economy is used in the same meaning as the term ‘economy based on knowledge’ (knowledge economy), and it is, as the authors correctly point out, industry intensive, adjusted to measure, with high fluctuation of products, there are flexible manufacturing systems, a virtual network of organizations, cooperative governance, integration, services are accompanied by products, power distribution/knowledge sharing, generalization of skills and knowledge, the state co-ordination and regulation.

In old economy, the authors conclude, traditional production factors (land, labor and capital) were prevalent as a source of comparative advantage, while in the new economy comparative advantage is based on innovative activity. The new economy is characterized by change, turbulence, diversity, heterogeneity, competitiveness and partnership, flexibility, and incentives. The growing importance of knowledge affects all spheres of social and economic life - how businesses entities, government and social institutions are organized, and how each individual behaves. The authors stress the great importance of the link between knowledge and the paradigmatic attitude of institutions that can provide overall social and economic development in the conditions of constant change. It is my great pleased to propose the publication of this book, which in its nature is a scientific monograph.

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