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KNOWLEDGE AND INNOVATION - THE ROAD TO
COMPETITIVITY

Abstract

The central idea around which this essay is built is that knowledge, as an appreciating asset, intellectual capital and investment in education is becoming a dominant reality in the new economics and knowledge-based society.

The first chapter underlines the importance of knowledge and intellectual capital as the main driven forces in the new millenium.

The nation's output depends not only on the number of hours people work ,but also on how productive those hours are. One of the important determinants of workers' productivity is education Both private and public returns to education are highlighted in the third chapter.

The implications of globalisation on the business world are of such a nature that it is necessary for us to redefine the economic concepts and models,aspect which I've tried to focus on in the fourth chapter.

In the fifth chapter the attention is headed towards the new economies, which in the global civilisation are based on innovations and, furthermore, on technological development which leads towards a high level of competitiveness and human development.

More and more countries are interested in becoming knowledge-based societies, thus being more prepared to face the challenges of the new millenium.

1. The knowledge-based society and the appearance of the intellectual capital as a resource

1.1 Knowledge - the main propelling force in the new millenium

The last decades have seen an expansion of the concept of "new economy" as a new type of approach concerning the economic science. A part of the economists think the modern economies are dynamic adapting systems rather than closed equilibrium systems, as it has been thought for a long time. Some of these are Kenneth Arrow, winner of the Nobel Prize and one of the first promoters of the neo-classic modern model, and Brian Arthur of the Santa Fe Institute. Sometimes the *new economy* is known also as the *economic school from Santa Fe* because many of the economists preoccupied with complexity thinking are affiliated to the center of interdisciplinary

research in this institute. The complexity specific to the modern economy environment determined some authors to plead for a new approach of the basic economy to a dynamic adapting system. That's why sometimes the economists studying the new economy are also called complexity economists. These economists argue that economies are like the human biological systems, following the same fundamental laws. These laws will manifest differently in economy as compared to biology, but if we can improve the level of understanding them, we will gain from the possibility of getting closer, to a greater extent, to the functioning mechanism of markets and firms. The difference between approaching the equilibrium in the classic economy as compared to the new economy is presented in a suggestive way by **Ilya Prigogine**: *"The classic economic model puts accent on stability and equilibrium. Today we notice the existence of instabilities, fluctuations and evolutionist tendencies that manifest themselves practically at all levels. We are in front of a universe much more complex and more structured than we could ever imagine. The end of this century is associated with the birth of a new vision on nature and science which brings the human being a little closer to nature, a science that makes from human intelligence and creativity an expression of a fundamental tendency in the universe. Thus new perspectives open up for the interdisciplinary research."*

In the new economy and in the society of knowing the intangible goods such as knowledge and the management of information and knowledge become the new nucleus of competences. In professor Quash's opinion, from the London School of Economics, we are in a world that places accent on the economic value of the intangible goods. We are dealing with "cognitive domains" where ideas are worth billions, while the products may cost less and less. In Peter Drucker's opinion, in the future there will be other success factors: "the traditional production factors - the land, the labour and the capital - haven't disappeared. But they have become secondary. Knowledge becomes the only resource truly relevant today." The new economy requires a rethinking of the production factors' theory. Knowledge becomes the essential component of the contemporary social and economic development system. The spreading of inovations and convergence of the top technologies will play a key part in increasing the spreading of knowledge in the context of the process of globalisation."

The modern concepts of "e-economics" and electronic trade demand the appealing to a nucleus of competences where knowledge will be the main propelling force. The new economy means showing a greater

interest to the so-called knowledge society, to the employee who is the the mean of knowledge, to the intellectual capital resource, as well as to learning organizations.

Knowledge has always been extremely important, we aren't homo sapiens for nothing. Throughout history, victory has been in the hands of those who used knowledge, being aware of its matchless potential: among these winners are the primitive warriors who learned to build iron weapons, the businessmen from the United States who, for a hundred years, are the beneficiaries of the best public school system in the world, with an extremely well educated work force and, of course, the list can be continued. But knowledge is much more important than before, because we are at the center of an economic revolution that gives birth to the Era of Information.

Knowledge, unlike labour, land and capital is an asset which gains value while being used. The more used, the more effective and efficient the knowledge becomes. In Karl Erick Sveiby's opinion, in the new economy, knowledge has four characteristics: it is tacit/implicit; it is action-oriented; it is based on rules; it modifies constantly being updated.

An organisation based on knowledge can give a new entrepreneurial vibe within itself and can motivate the top managers to be preoccupied with transforming the organisation so that it becomes capable of capturing, applying and developing value as a consequence of implementing some high performance technology solutions. Knowledge and advanced technologies can transform in a significant way, a nation's economy.

Knowledge and information are the thermonuclear, competitive weapons of nowadays. Knowledge is more powerful and more valuable than natural resources and big factories. Let's take, for example Microsoft and Toyota which have not become what they are today because of being wealthier than IBM and General Motors. On the contrary. But they had a much more precious thing than physical and financial assets, they had intellectual capital resources.

1.2 The appearance of the intellectual capital resource

The society of the third millenium disposes of employees who are valuable because of their knowledge. In many of these companies, value isn't found with the tangible assets, but with those intangible resources.

The intellectual capital is the term applied to the combined intangible assets that allow the company to work efficiently. The intellectual capital is the practice and the intuition of a team of chemists who discover a new drug worth millions of dollars, is the ability of workers to innovate in thousands of horse-power to improve the efficiency of a factory. It is the electronic network that transports information at the speed of light through a company, so that the answer is faster and prompter than that of the rivals. It is the collaboration between a company and its clients, the strong bond between them which brings back the client again and again. It is the power of the collective mind. It is very difficult to identify and even more difficult to use it efficiently. But once we find and exploit it, we will surely win.

The components of the intellectual capital are:

- **The market assets** - are those deriving from a good relationship of the organisation with the market and the clients. The market assets reflect the potential of an organisation due to some intangible assets concerning the market. Examples can include: the clients and their degree of loyalty, the distribution channels, different contracts and agreements etc.

- **The assets based on intellectual property** - include the „know-how”, the commercial secrets, the copyright, the patents, or other rights. The intellectual property represents the legal protection mechanism of several assets of the organisations.

- **The assets based on human resources** - refer to the ability and creativity shown in solving problems, as well as to the leader, entrepreneur and manager qualities of the employees of an organisation. The individual is not abilitated to carry on a certain activity, on the contrary, he has to prove he is a dynamic person, who can carry on a variety of activities in time. As they become more competitive in the activity carried on, people learn more and more and become increasingly valuable.

- **The assets specific to infrastructure** - have in view those technologies, methods and processes allowing an organisation to work efficiently on a long term. The examples include: the organisation culture, the methods of management, the financial structure, the data bases and the information about the market or about the clients, the communication systems like the e-mail and the modern teleconference systems.

A hundred years ago, labour was relatively cheap. In the third millenium labour stops being cheap. The assets based on human resource with which an organisation has to operate will be rare and expensive. The

amplifying of the importance of the intellectual capital reflects the increase of the dependancy of some organisations on the intangible assets. Every day new types of companies that have intangible assets appear. Their products are intangible and can be electronically distributed in the "virtual market space" via internet.

The intensive organisation, from a point of view of media, means and of knowledge, whose products are digital, are the organisations of the third millenium. The world has changed again and new means of monitoring and managing these organisations that reflect these changes must be found. The people of the third millenium rely more and more on knowledge. They want to understand and enable objectives to be achieved and to know their role in the organisation.

In the third millenium the organisation from Romania must place the accent on encouraging the personnel involvement by showing consideration to the contribution of an individual inside an organisation. There are several ways to try to increase the potential and the obvious value of the people in an organisation. The modern forms of investing in education are especially recommended: high performance degree training, activities about knowledge as well as forming some components concerning the carrying on of some activities. As the labour force becomes increasingly global", the valuable employers and employees invest in themselves the more. This can contribute to the protection and the increase of the components' nucleus. The so-called analysts of knowledge are ever more requested to work with the individuals of an organisation to identify the key assets for knowledge. To permit the increase in the people's power, it is necessary to measure the asset values based on the human resource. Knowledge is power and profit.

Each country, company and individual depend more and more on knowledge: license patents, abilities, technologies, information on clients. Even Pope John Paul the 2nd acknowledged the increasing importance of knowledge in the "Centessimus Annus", by writing: " if some time ago the decisive production factor was the land, and later the capital, nowadays the decisive factor is the human being himself, the human being and his knowledge."

The spreading of the intellectual capital can be reached in the third millenium if innovation and creativity are ubiquitous in an organisation. The feeling of success is expressed and the need of a permanent mutation and change is felt.

The true "heroes" of an organisation are those in their careers and thus helping their organisation to be a winner in the competition to develop in the long run. This means also the creation of a culture of the organisation which promotes and supports the innovation process. There is a direct relationship between the extent to which an organisation proves to be innovating and its ability to expand its intellectual capital resource. The extent to which a company is innovating is also a measure of its surviving force.

2. Knowledge and Innovation - the Road to Competitvity

Starting with 1998, OECD (the Organisation for Economic Cooperation and Development) and the World Bank cooperated in their activities to create economies based on knowledge, and were helped in their efforts by countries going through transition also.

In Carl Dahlman's opinion, manager of the Programme "Knowledge for Development inside the Institute of the World Bank": "To benefit by the knowledge revolution, concrete strategies that can satisfy the four pillars of the knowledge economy are necessary:

- an institutional and economic background that promotes the efficient use of knowledge;
- an educated population endowed to create and use knowledge;
- a dynamic information infrastructure;
- an efficient innovating system inside the companies and the research centers that can satisfy the new needs of the population."

3. Investment in Education

3.1 The private benefits of investment in education

The employees gain additional value. Their value for the organisation, when they are understood and appreciated, is incomparable." David Decenzo

Managers all around the world make decisions on investing their own capital. They weigh things carefully before making a decision and analyse every alternative and opportunity to acquire asset values. Let's take for example the buying of a car. They think which one is best and which one would bring the most benefits. In the end, they will invest tens or maybe hundreds of thousands of dollars for that car.

For the managers to appreciate the employees according to their contribution, it is necessary that they should have an appropriate education. A person's level of education affects the level of his earnings, as there is a direct proportionality relationship between them. The more profound the studies of a person are, the better this person is acquire to absorb the new information and to familiarise with the new technologies, thus their earnings are considerably greater.

The education a person receives has strong implications on his work place. In his book "Studies on the Human Capital", Jacob Mincer specifies: "the educated employees have at least two advantages in comparison with the less educated, among which are: bigger wages and a bigger job stability at their work place."

Another aspect worth mentioning and closely related to education is represented by the quality of our lives. The persons with a higher level of education tend to have a better health state than those with a lower level, the former making an investment in themselves, which they protect by taking preventive measures.

3.2 The public benefits of the investment in education

Economists have been interested in the economic growth the moment Adam Smith elaborated his study on the nations' riches.

The education's contribution to the economic growth is made through two mechanisms. The first and the best known is the creation of new knowledge, also known as the "Schumpeteriana growth". The much more educated persons will later become scientists and investors working to contribute to the growth of the human intelligence stock by developing new processes and technologies. So, we arrive at the second mechanism through which education affects the economic growth by transmitting knowledge and information. The schools ensure the level of education necessary to understand the new information, and in this range of ideas Romania is among the first countries, in my opinion. The rising of the educational level facilitated greatly the process of innovation, that took place in the computer industry, for example if there hadn't been for the schools to teach the pupils and the students how to use these new applications, the innovation's effect would have been much diminished.

Education transforms people, they become better citizens, mothers, fathers and children. In his study "Capitalism and Freedom", written in

1962, the winner of the Nobel Prize Milton Friedman describes some of the effects associated with education: " a stable democratic society can't exist without a minimal degree of studying and knowledge by its citizens and without the acceptance of a common set of values. Education can contribute to both."

4. The Knowledge Economy and the Competitive Advantage

The implications of globalisation on the business world demand a redefining of the concepts and of the economic models.

Today the accent is placed on flexible, agile enough organisations that need specialists who work together in teams. Such teams are suggestively called multi-functional teams. We thus move from the world of narrow specialisations towards the world of teams and especially the world of inter-functional teams underlying not only the product quality, but also that of those making decisions in the business world. The inter and multi-functional teams consist of members having different qualifications and competences. And this fact is full of meanings in the new economy and in the knowledge society. Here is a new challenge Romania has to accept a condition she must provide in her process of transition towards a knowledge society. The work teams also require other organising structures rather than the pyramidal structures specific to the traditional organisation based on hierarchies and the division of labour. A horizontal structure facilitates the labour organisation around production processes which share the clients' needs and not around the functions and duties that need to be fulfilled. Career directions favour those who can practice several professions and who show real qualities for working in a group and for continuous improvement. the new business world remodelling and reconfiguration has had a considerable impact on some of the key economic concepts and models, which implies:

- introducing multi and inter-functional teams;
- adopting horizontal structures and removing hierarchies;
- re-engineering processes.

The accent has been moved from organising labour as a traditional production factor based on the division of labour, towards organising people in teams and towards identifying and developing the career and competence management. Experience has proved that dynamic performing

teams can be more efficient in an environment dominated by change than the big organisations individually or the singular persons could.

The new economy must take into consideration such an approach and incorporate these new concepts into the economic science discipline. Many of the performing modern organisations change and are no longer interested exclusively in maximising profits, but they look to maintain themselves in the business area, in competition with other performing organisations. Some organisations transformed and eliminated the formal structures, especially the pyramidal structures. The personnel of such organisations is no longer interested in having a job that formally takes place at the same office; such persons simultaneously attend several work places; the accent is no longer placed on the traditional specifications of a certain duty in a work place or on a severe programme, strictly observing certain hours.

The competitive organisations think individuals become much more interested in the activities that challenge them to manifest their creativity and inventiveness, bringing them satisfaction; such individuals show less interest in a certain formal socio-professional status or in detaining certain titles with social resonance.

The economic and technological convergence are generated by globalisation changes and will continue to change the manner in which wealth is created both at a national level and at a transnational level. To facilitate the effective spreading of knowledge and innovation, an important information-based structure is developing more and more. Amplifying the convergence will have a significant impact on the economic bases of all countries involved in or affected by the process of globalisation. Globalisation considerably modifies the manner in which business is conducted and make the spreading of the "know-how" and of innovation.

From this point of view organisations must become more and more competitive. This makes it necessary to reformulate the principle of the comparative advantage by appealing to a concept much more suggestive in the context of the new economy and of the knowledge society, that of the competitive advantage.

The main factors allowing Romania to become innovative have in view:

- **Consistent investments** as size order in education in general and in the superior level education in particular
- **A quality technological and information-related basis**

- High levels of Government spendings on research and development
- Efficient laws to protect the intellectual property to sustain the research-development activity.

5. The Knowledge Economy and the Technological Process Effects on the Human Development

In the global civilisation, the new economies based on innovation have, as a main component, the technological development which leads to a high level of competitiveness and to human development. The technological progress is essential for the human progress. The digital, genetic, molecular innovations open up new perspectives and "break the frontiers" related to the way people can use technologies to extend their knowledge, by stimulating growth and development. The new technologies spread both among different countries, and inside them. The technological innovations affect the human development. The human development and the technological progress are supporting, intensifying and propelling one after another:

- The technological innovations can improve the human potential and abilities
- The technological innovations are a means of ensuring the human development
- The human development is an important means of sustaining the technological development.

The analysis of the Human Development Index in the countries in transition provides results of open offers. So, even if it is placed last, compared to the value of the human development index among the seven countries in transition grouped as states with a medium value of the HDI, Romania recorded, during 1990 and 1998, the lowest negative value in the modification of the human development index.

In Gerardo Berthrin's opinion, author of the **National Human Development Report, Romania 2000**, "... the synergy and the articulation of these three dimensions will ensure favourable premises so that the Government's actions lead to Romania's acceptance as a EU member and to the ensurance of a human development on the long term."

The analysis of the tendencies recorded in the evolution of the human development index in Romania during 1995 and 1999 proves that there are some evolution tendencies of the three components of the HDI in less synchronized directions:

- The medium life expectancy at birth reduced starting with 1995 up to 1997, then it began to grow reaching a 69,7 years level in 1999
- The last five analysed years under analysis have proved among adults, an illiteracy-eliminating rate staying relatively constant, a slight growth of 97,2% rate, being registered only after 1998
- On the whole, the situation of the development index on the educational system in Romania improved.

The knowledge society, in general and the knowledge economy in particular lead, according to some authors, even to the modification of rules specific to the traditional economic development: "...Societies or regions can evolve from economies with a strong agrarian character towards knowledge economies without necessarily going through an industrialisation phase."

A society based on cultural diversity has to invest strongly in education, in health protection and in other programmes of a social character. The key-principle that has to reign in modern societies over the investment policies, public or private should be that of allowing and favouring a special investment in the human and social capital resource. This principle can be applied and linked to the systems that ensure prosperity and life quality as well as to other aspects of the socio-economic development. The traditionally understood prosperity, based on the transferable programs payment system, on bureaucratic services and on the so-called social engineering, must give way to the new approach about the active prosperity, the continuous education and the development of systems which ensure life quality by appealing to a set of priority investment programmes, like those concerning the investment in education.

Education and implicitly the investment in education must become key components for the ensurance of an authentic human development on the long term.

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