

ACCOUNTING IN KNOWLEDGE-BASED ECONOMY. THE CASE OF THE ROMANIAN ICT INDUSTRY.

Bogdan Victoria¹, **Popa Dorina**², **Beleneși Mărioara**³

¹ Department of Finance-Accounting, Faculty of Economic Sciences, University of Oradea, Romania

² Department of Finance-Accounting, Faculty of Economic Sciences, University of Oradea, Romania

³ "1st December 1918" University of Alba Iulia, Romania, PhD student and Department of Finance-Accounting, Faculty of Economic Sciences, University of Oradea, Romania

vicbogdan@yahoo.com

dorinalezeu@yahoo.com

mimibelenesi@yahoo.com

Abstract: *The first objective of the paper is to carry out a retrospective of the literature written on the topic at the national level, yet especially at the international level regarding the aspects of accounting in knowledge based economy, starting from concepts such as knowledge, typology and the role of knowledge, knowledge based economy and the characteristics of accounting in knowledge economy. In order to review the literature in the field, we used the quality research with a descriptive-conceptual perspective of a fundamental type, according to the deductive method, starting from concepts and theories existing at the level of knowledge based economy and the accounting used in this new economy. The paper has also in view the drafting of a study at the macroeconomic level, regarding the evolution of ICT Industry in Romania in the last half of decade, a period in which the economy and its sectors have been seriously affected by economic imbalances. The study is framed within the area of quantitative research, in a preponderantly inductive approach, using interpretative methods for the understanding of the effects of economic conjunctures on the ICT industry, a knowledge-driven industry, as a component part of a knowledge-based economy. The collection of data has been made by accessing the webpage of the Institute of Computer Technology through an IT programme installed on a personal computer which has allowed the downloading of files in an intelligible format. The data presented in these have been retained and processed simple arithmetic calculus: data processing was made with tabular calculus. After collecting and processing the primary data, the results have been analysed quantitatively, both as absolute and relative sizes and as evolution in time, by graphically representing them. The second objective refers to the analysis of traditional accounting model versus the knowledge based accounting model, emphasising the limits of the traditional model and outlining several orienting directions for the knowledge based model.*

Keywords: *knowledge, knowledge based economy, accounting, ICT industry, Romania*

JEL classification: *M41, D83, O11*

1. Introduction

We are the witnesses of some major changes. The world economy is experiencing an almost radical transformation. The land, the labour and the capital, the main factors of production of neoclassical period, are now much more inferior to the new factors which contribute to the economic growth. If for the agrarian period, the land used to represent the only source of exploitation, for the industrial period, the scales is moving towards the physical capital which consists in industrial type buildings (plants, combine group of enterprises, industrial halls) and technological equipment (technical installations, machines, equipment). And in what the man is concerned, this one was rather perceived from a quantitative perspective than a qualitative one. Their number being more important than individual qualities.

The 20th century adds two more important factors of production: technology and entrepreneurship according to Joseph Schumpeter (in Carayannis et al., 2006). The phenomenon of globalization and the tremendous development of Industry of Communication and Information Technology has led to important changes in the society's structures overall (Negucioiu, 2009: 2).

The post-modern period shows the tendency to dematerialize and virtualize many of the component elements of the society and of the economic-social relations, introducing modern technology in all of its aspects and the technological development depends on intellectual resources not on material ones. The era of technological changes and of innovation has considerably altered the way we live (at work, home and in our free time) and has intensely changed the way we do business, has redefined the resources and directions of the companies. By the end of the 20th and the beginning of the 21st century, there could be seen a new change of conception. Many scientists and specialists such as Peter Drucker (1993), identified knowledge as being, perhaps, the sixth and the most important input and output key factor of the economic activity. There are more and more proofs that intangible assets such as the knowledge, the know-how and social capital will become the goal, the oil and the diamonds of the 21st century (Carayannis et al., 2006).

The newly created economy is knowledge based. An economy based on production, distribution and use of knowledge and information (OECD, 1996). The interest has shifted rather towards the individual, towards his capacity of innovation, creativity, scientific research, continuous learning and relational capital. From an economic point of view, all these changes have a special resonance when evaluating a company and this represents a real challenge for the economists. *There are many examples of companies such as Facebook, Google or Yahoo, for whose activity the main tool is the Internet and whose market value exceeds the value recorded by accounting. Hence, the questions: can accounting reflect the faithful image of the economic reality and eliminate this discrepancy? Is the accounting system ready for this new economy? Does the accounting practice manage to assess and recognize in financial reports the entire whole of intangible forces which results in value creation?*

Knowing all these, the research subject of this paper is to analyse and provide a quantitative and qualitative system of information regarding the literature in the field at the national level and especially at the international level regarding the aspects of accounting in knowledge-based economy, starting from concepts such as

knowledge, typology and role of knowledge, knowledge-based economy, the characteristics of accounting in the knowledge economy.

Therefore, the first part of the paper makes a review of the literature in the field regarding the knowledge, categories of knowledge and its role, the knowledge-based economy and the characteristics of accounting in the new economy. The second part presents a study at the macroeconomic level, regarding the evolution of the main indicators of the ICT industry in Romania in 2007-2011.

The reasons behind this choice are based on the fact that this research theme is perfectly framed within the times we are living. The drawbacks of the traditional accounting model applied in the new economy, the knowledge-based economy, make the subject more and more exciting.

2. Theoretical framework.

The appearance of the Internet has brought major changes in the economic and social life. The WorldWideWeb type recipes have facilitated the access to an immensity of products and services which has determined a growth in the dynamics of scientific and economic environment. Nowadays, we have access to a large volume of information, yet this is not enough. It is the human force who decides, capable of thinking, creating more and innovating. According to Muntean et al (2001), the information serves us and it comes from outside while knowledge is related to human reasons, it is an internal development, an enrichment of our practical existence, a result of our operative and creative capacity.

2.1. The knowledge - conceptual delimitations

According to most of the authors, (Muntean et al., 2001; Brătianu, 2006; Andone, 2003; Luban, 2005) before defining knowledge, we should have in view the pyramid of knowledge which has on the base data, followed by information, on a superior stage being knowledge, on the top of the pyramid being wisdom. On the other hand, David Rooney (2005) appreciates knowledge as being misleading and its precise nature has been a long-debated thing for three centuries onwards.

Scanning the literature in the field, we find opinions placing the concept of knowledge within the sphere of the individual, as a subject of knowledge (Howitt, 1996 quoted by Sabău, 2010; Davenport and Prusak, 2000; Sabău, 2001; Stan Davis and Jim Botkin quoted by Muntean et al, 2001, Rooney, 2005) referring to the ability of a person to learn, enterprise, organize and train so that by the experience accumulated they get the appreciated surplus from material sources. The authors of more recent studies see knowledge as as the most important factor of production of current economy whose efficient use generates wealth and economic growth (Shapira et al., 2006; Carayannis et al., 2006; Lin, 2006; Burja and Burja, 2011, Heng et al., 2012). According to Shapira et al. (2006), the knowledge represents the sum of all individual and collective human capabilities to learn, disseminate and commonly use knowledge, informational capital and collaboration relations, intellectual property and management values.

Knowledge is nowadays the prominent economic resource – more important than raw materials and, many times, even more important than money (Stewart, 1998), and the economic finality and generating added value is the objective of having knowledge, its complexity and modernity (Nicolescu and Nicolescu, 2005).

2.2. Knowledge typology

The diversity of knowledge with different applicability is different in managerial, economic, technological, educational processes, yet with partially heterogeneous characteristics, has been emphasized in time by the analysts in the field. For example, Jones (1999) classifies knowledge according to content, in two categories: *know-what*, which help us perceive and understand a phenomenon, a stage of a process or even a process in itself and *knowledge of how to get things done or know-how*, which help us produce and capitalize in a profitable manner goods and services, being the result of applicative research, of the processes of enhancing and modernizing the techniques, systems products. In the opinion of other OCDE – Organisation for Economic Co-operation and Development – (1996) specialists, the two categories are enhanced with *know-why* knowledge, that scientific knowledge based on laws, rules and principles of nature according to which technology is developed and the *know-who* type products, services, systems and knowledge is developed which represent a combination of knowledge about something (*know-what*) with that on how things get (*know-how*) and consist in the development of special relations, involving some experts, being oriented towards organization and its environment (see Figure 1).

Most of the authors (Muntean et al., 2001; Luban, 2005; Nicolescu and Nicolescu, 2005; Brătianu, 2006; McPhail, 2009) are, yet, preoccupied with the distinction between tacit knowledge and explicit knowledge, a differentiation made according to transferability criterion. *Explicit knowledge* is knowledge that can be expressed. It is accessible to any person who can understand the presentation language, being easy to codify and send. *Tacit knowledge* has a personal character, related to the ideals and values specific to each person whose knowledge is clearly based on their own experience and actions. In order to use and capitalize this knowledge to the best, organizations are trying to store the knowledge they consider explicit to be able to give it to their employees while the organizations which appreciate more the tacit knowledge (especially those organizations with an oriental culture) are based on facilitating the meeting places of the employees so that they can establish direct connections among them, in order to voluntarily, unconsciously gain the others' knowledge. Yet, for the organization both categories are equally important and this is conditioned by the way in which the corporate culture combines it.

Regarding the economic *roles* knowledge has in contemporary economy, they are resumed by specialists like Nicolescu and Nicolescu (2005) to four main categories as it can be seen in Figure 1. According to the authors, the knowledge has the role of *raw material* especially regarding the modern products obtained. If we admit that the raw material represents the main substance in the composition of the finished product, being found in it totally or partially, in an initial or transformed form, in order to make a tab, for example, knowledge represents the main "substance" participating to a great extent to getting the finished product. Generally, the high-tech products are based on substantial incorporated knowledge so that we can say that it is the raw material in the ICT industry just like the flour in the panification industry. Let us think to the composition of a tab of almost one thousand euro which weighs less than one kilogram, plastic, metal and other materials are incorporated (whose cost is of only a few tens of euros) and a lot of knowledge

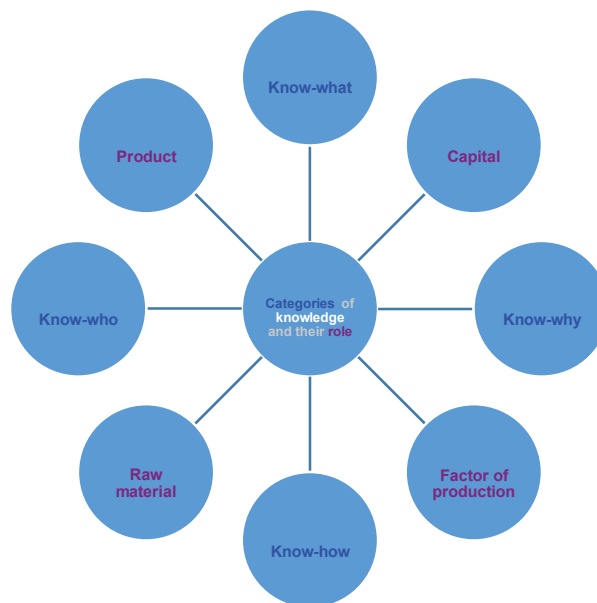


Figure 1: The main types of knowledge and their role in economy

Source: the authors' processing according to Nicolescu, O. and Nicolescu, L. (2005) "Economia, firma și managementul bazate pe cunoștințe", Editura Economică, București, p. 33 and p. 36

As a *factor of production*, knowledge – intellectual factors – participate together with physical factors of production, in all the stages of the production processes, from getting the raw materials to processing and selling the finished product. By the contribution it has as a factor of production, knowledge has brought in economy changes related to the structural-organizational nature by the appearance of new types of organizations such as the network-firms. These forms of organizations are characterised by the fact that they are small firms whose objective is to produce and commercialize a product which is made only with the help of other firms. *Knowledge has the form of the stand-alone finished product*, when it can be found in software programmes, technical projects, patents, quality standards, management analyses and studies, marketing, high-tech products, etc. The diversification of this range of products contributes to the establishment of the role of knowledge as finished products according to its contribution to a firm's turnover and in the GDP in economy. *The knowledge capital* owned by a firm contributes to the firm's overall value. Together with the tangible capital of a firm, the intangible capital – technologies, the commercial, managerial, financial know-how have a decisive role in monetary expression. Currently, the importance of the role of personnel in a firm is demonstrated by the stock exchange quotation of the well-known firms in the IT field such as Facebook, Google or Yahoo, where the value of knowledge significantly exceeds the value of physical assets. In the future, the tendency to assess a firm's capital is considered by specialists to be highly influenced by knowledge as a distinct component. All these represent arguments showing the multiple and essential roles knowledge has in contemporary economy. The knowledge-based economy depends

on the value that knowledge can generate, thus being the result of knowledge revolution.

3. Research methodology

The objective of the paper is to make a retrospective of the literature in the field at the national level and especially at the international level regarding aspects of accounting in knowledge-based economy, starting from concepts such as knowledge, typology and roles of knowledge, knowledge-based economy, the characteristics of accounting in knowledge economy. The international literature is effected by the theoretical contribution of researchers like Carayannis, Davenport, Prusak, Drucker, Heng Jones, Lin, McPhail, Rooney, Stewart, Mansour etc. At the Romanian level, researchers like Nicolescu, Burja, Luban, Muntean, Negucioiu, Andone, Brătianu and others bring an important theoretical and empirical contribution to this field.

In order to review the literature in the field, we used the qualitative research of fundamental-type descriptive-conceptual perspective, after the deductive method, starting from concepts and theories existing at the level of knowledge-based economy and accounting used in this new economy. The humankind has been living and experiencing for some time the most *profound* and *extensive scientific-technical, technological, informational and telecommunication revolution* (Negucioiu, 2009: 2). What appeared in the emerging economies in the last years of the 20th century is the knowledge-based economy – an evolutionary framework of the social transition dominating human behaviour of the 21st century. Among the leading forces towards a knowledge-based economy are the informational and communication technologies. Considered validators of change, they release creative potential and open up global markets, increasing competition (Carayannis et al., 2006).

Based on the ideas presented previously, the paper has in view a study at the macroeconomic level regarding the evolution of ICT Industry in Romania in the last half of decade, a period when the economy and its sectors have been affected by serious economic imbalances. The active implication of informational and communication technologies in all economic and social sectors has determined the ICT industry to become the most dynamic sector of the national economy. Although a new industry (approximately 50 years old) compared to the classical branches of economy, it has been growing in a pace comparable to that of other countries.

The ICT Industry is structured into two main components: ICT Services and ICT Processing Industry. In its turn, the ICT Services field contains 2 sectors: Telecommunications and Software and IT services, while the ICT Processing Industry refers to hardware and electronic. The information contained in this study is based on the annual analyses of the Institute of Computer Technology, which, in its turn, was mainly based on processing the balance sheet data of the firms in the ICT Industry in Romania and, also, on information communicated by the companies and provided by other public institutions like NIS, NRB and NCA.

The study is framed within the area of quantitative research, in a preponderantly inductive approach, using interpretative methods in order to understand the effects of economic conjunctures on the ICT Industry, a knowledge-based industry, as a component part of a knowledge-based economy. The collecting of data is a simple process in this case, consisting in accessing the webpage of the Institute of Computer Technology through an IT programme installed on a personal computer

which has allowed the downloading of files in an intelligible format. The data presented in these have been retained and processed through simple arithmetic calculus. Data processing is made with tabular calculus. After collecting and processing the primary data, the results have been analysed quantitatively, both as absolute and relative sizes and as evolution in time, by graphically representing them. By comparing sizes and evolutions, we will conclude the results through a qualitative analysis.

4. Results and discussions

Regarded as a set of the three sectors: Software and services, Telecommunications and Hardware and electronic, the ICT industry experienced extreme times in the last decade, also remarkable moments and moments of constraints. The year of 2008, the year when the global crisis started is the one concluding a period of eight years of continuous growth, expansion which was difficult to repeat in the following years. Even so, the ICT industry has overcome the period of recession more easily than other spheres of economy. The ICT industry experienced in 2010 and 2011 some predominantly positive tendencies. The IT sectors (software and hardware) have evolved ascending with a maximum of growths in 2010 and in telecommunications the contraction was considerably alleviated.

Table 1: The ICT Industry in 2007-2011

| Indices | Period | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------------------|---------------|-------------|-------------|-------------|-------------|-------------|
| Turnover, mil euro | | 8,279 | 9,119 | 8,554 | 9,269 | 9,425 |
| Sold production, mil euro | | 6,809 | 7,830 | 7,661 | 8,357 | 8,489 |
| Added value, mil euro | | 3,733 | 3,793 | 3,475 | 3,403 | 3,424 |
| Export, mil euro | | 2,008 | 3,008 | 3,378 | 4,322 | 4,720 |
| Number of firms | | 20,029 | 20,449 | 19,752 | 19,223 | 18,700 |
| Personnel | | 123,733 | 123,992 | 118,243 | 118,008 | 119,105 |

Source: the authors' processing in accordance with the annual reports published by the Institute of Computer Technology, available online www.itc.ro, site visited on 15.01.2013

Regarding the total turnover of the ICT industry in the period analysed, it records a maximum level in 2011, reaching 9.4 billion euros, 3.25% more than in 2008 and 12.16% more than the minimum value recorded in this time interval, in 2007 respectively. The increase of the turnover in the IT sectors, which have compensated the decrease in telecommunications, has contributed to this favourable situation.

The volume of revenues and production/services sold by over 18,000 firms of the ICT industry had a track similarly with that of the turnover of the interval of time analysed. For the Telecommunications sector, only 2008 represented a growth of 4% compared to the previous year, the rest of the interval presenting a significant diminishing of revenues in services, with 18% less in 2011 compared to 2008. The increase of the production sold of the Software and services sector in 2008 with 27%, followed by a decrease of 9% in 2009, it reaches a maximum level in 2011, with 38% over the one recorded at the beginning of the period. Totally in contrast with Telecommunications, the Hardware sector presents a constant increase during the entire period analysed, with a triple level in 2011 compared to 2007. The added

value had an unfavourable evolution, recording, starting with 2008, a substantial reduction (8%) for 2009, followed by a slight decrease in 2010 and a slow recovery in 2011, thus remaining below the level of 2008. The GDP contribution to the ICT industry fell below 3% in 2011.

The total export accumulated new increases reaching 4.7 billion euros, with 57% over the value of 2008 and 135% over that of 2007, a much superior level to other sectors of economy and comparable only to the automobile sector. In this case, too, the advance has been determined by the hardware and electronic sector, where the export grew exponentially, every year, and also, by the software and services sector where the increase in price, even though not as spectacular, showed a plus of 45% compared to 2008. We cannot say the same thing about the Telecommunication sector whose export volume recorded in 2011 half of that of 2007, with a contribution of only 8% to the entire industry.

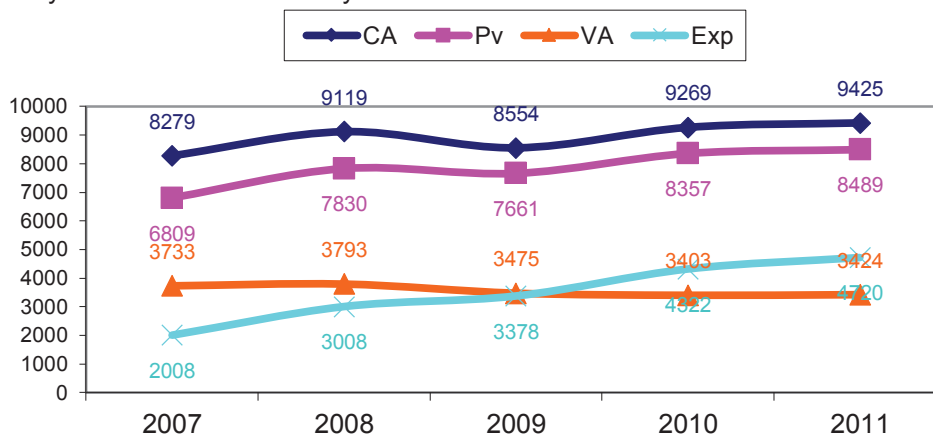


Figure 2: The evolution of the main indices of the ICT industry in 2007-2011 (mil. euro)

Source: the authors' processing in accordance with the annual reports published by the Institute of Computer Technology, available online www.itc.ro, site visited on 15.01.2013

The population of ICT firms was reduced in 2010 and 2011 with 1,000 units, less than 2007, reflecting the condition, still difficult, in companies operate and the accentuation of the tendency to consolidate in industry. The trajectory to reduce is similar to the three sectors of industry. It is worth noticing that the weight of the software and service companies in the total volume of the firms of ICT industry, 80%, while the other two sectors share a percentage of only 20% (16% - Telecommunications and only 4% - Hardware). The contraction of ICT personnel manifested in 2009 and 2010 stopped beginning with 2011, but with different evolutions in the three sectors. In software and hardware sectors, the companies started advertising vacancies and the personnel increased in five years with 4,593, while in telecommunications the redun continued (-10,898). Despite all these, the two sectors mentioned previously have the significant percentage in the volume of ICT personnel (49% and 35% respectively). Taking the three sectors as a whole, the

total number of employees reached 119,105 in 2011, with more than 5,000 lower than in 2008, the percentage decrease (-4%) being significantly inferior to that at the level of entire economy.

Table 2: The ICT sectors' contribution to GDP

| Period | 2008 | 2009 | 2010 | 2011 |
|-----------------------|--------------|--------------|--------------|--------------|
| Sectors | | | | |
| Telecommunications | 2.07% | 2.13% | 1.90% | 1.66% |
| Software and services | 0.87% | 0.93% | 1.01% | 0.98% |
| Hardware | 0.20% | 0.23% | 0.24% | 0.24% |
| ICT Industry | 3.14% | 3.29% | 3.14% | 2.88% |

Source: Mircea Vuici, *Industria TI&C 2010-2011 – Sfârșitul crizei?*, available online: www.itc.ro, site visited on 16.01.2013

The ICT sectors contributed to the Gross Domestic Product with 3.14% in 2010 and 2.88% in 2011, a decrease in comparison with 2009 (3.29%). In spite of all these, the GDP contribution increased in 2009 (a difficult year challenged by the economic crisis) compared to the previous year (3.14%), which indicates a less severe contraction in the ICT industry compared to the rest of the economy. The contribution of the Telecommunication sector to GDP continuously decreased during the entire interval analysed. Even during the economy's general expansion period, the evolution of the sector was not a favourable one. In 2008 already, the contribution to GDP decreased to 2.07%, in 2010 to 1.9% and in 2011 to 1.66%, a much more inferior percentage compared to 2008. Yet, the other two ICT sectors have recorded major changes of gross added value and the percentage in GDP has slightly increased, yet without counterbalancing the reduction in telecommunications. The contribution of the hardware and electronic sector increased from 0.2% in 2008 to 0.24% in 2011 while the software and services recorded an increase from 0.87% to 0.98%. The initial shock of the crisis was fast overcome by the ICT industry, whose evolution followed a positive trajectory in 2010 and 2011. In these two years, the activity volume in software and services increased reaching the level before the crisis and the continuous growth in the hardware sector double the production and the exports.

The future evolution is quite unpredictable considering the reduction in the external demand already felt in the second half of 2011 and the first half of current year, materialized in the diminishing of production, export and turnover in the hardware and electronic sector and software and service sector. Until it will be possible to narrow the gap of Nokia, by launching the productions of new firms which have taken its place at Jucu, based on the revival of the internal consumption which proved incapable in 2011 to compensate export, the hopes for a positive evolution in 2012 are replaced by the firm belief that we would be the witnesses of the maintenance at the same level as the one as the previous year.

The traditional accounting model versus accounting in knowledge-based economy

The concept of enterprise has known an evolution determined by the necessity to skilfully memorize, use and connect knowledge. Nowadays, the concept of enterprise cannot be summed up only to the capacity to optimally organize identifiable physical assets in time and space. Considering the progressive increase of intangible inventions and of the importance of their more efficient management, their registration as assets is more and more imminent. The problem is that the current accounting systems cannot manage to optimally identify and measure intangible investments. For example, the identification of the assets given “by a proper quality of communication and social reports” (Feleagă and Malciu, 2004: 35) is not easy to achieve.

Even though in the accounting literature there are more and more debates on knowledge-based economy, the literature has focused only on the inability of traditional accounting concepts and methods to represent the intangible nature of the contemporary capitalism. The result of the studies showed that these drawbacks are perceived as being the results of considerable differences between the values existing on the market and those reflected in the accounting records (Seetharaman et al., 2002; Mouritsen et al., 2001; Power, 2001 quoted by Ken in 2009). Regarding the inconveniences of traditional accounting, Lev, a typical fighter of traditional accounting (mentioned Mansour et al in 2008), criticizes the weak results concerning the presentation of the intangibles internally generated such as Research and Development, the brands, the employees’ talent, propellant components of any knowledge-based business. The conventional accounting model recognizes only the assets purchased from others of a knowledge-based business and not the internal initiatives generated by the knowledge-based management. Considering all these, we appreciate that the current accounting treatments underestimate and misrepresent the financial results of the knowledge-based business. The following table presents the obvious comparison between the industrial business model and the knowledge-based business model.

Table 3: Industrial Business Model vs. Knowledge-Based Business Model

| Industrial business model | Knowledge-based business model |
|----------------------------------|---------------------------------------|
| Tangible | Intangible |
| Focus on finances | Balanced set |
| Released by event | Released by process |
| Cost | Value |
| Periodical reporting | Instant access |
| Past-oriented | Future-oriented |
| Value in things | Value on flows |
| Production statistics | Innovation statistics |
| Standards and standard | Common, yet personalized |

Source: adapted after Despres & Chauvel, 2000 in Mansour et al, 2008

With the help of *alternative methods regarding the accounting of intangible assets accounting* it has been tried to remove the drawbacks, or better said, the rules of traditional accounting. The alternative models come to complete the traditional ones and to allow an improved reflection of intangible assets in accounting.

It is certain that, in a new economy, significantly changed compared to the industrial economy, the methods of traditional accounting are not suitable anymore regarding the intangible assets. The new methods have in view the release of value creation from the constraints imposed by a value reporting system based on industrial economy. The new methods of value creation in knowledge-based economy would be more efficient if they were conceived in terms of innovations. The investments in intangible assets such as development and research, know-how, employees training, relational capital and other similar assets create wholly new services, products, processes, as a result of the innovation process and capable to attract surplus value.

Therefore, it is essential to present relevant information, to exist an overall approach of tangible assets and, especially of intangible assets which contribute in the process of value creation, placing the latter in the suitable place in the financial reporting system, giving them the appropriate importance. In order to fathom the understanding of the role of accounting in knowledge-based economy, we will further try to present the main **characteristics** of accounting in knowledge-based economy:

- The diminishing of the percentage of tangible physical assets in the total of fixed assets;
- The development of internal base of knowledge and the expansion of connections with the clients, suppliers and other external human resources;
- The development of research-development, innovation, creativity activities and the recognition of the synergetic collaboration options in the field of knowledge;
- The financial reporting model is based on the internal organization model of the knowledge-based firm and it is analogue to the human cognitive model;
- The evaluation and reporting of the firm's performance according to the managerial skills to emphasize the knowledge through the options, decisions and actions that it runs;
- The reorientation of the firm's major investments towards training , education, continuous professional training and the development of the main human and communication speciality skills;
- The reconfiguration of the employee motivation system according to the IAS/IFRS standards;
- The development of the aspects regarding the financial reporting and communication by the stakeholders in order to meet their needs to be informed;
- The recognition, capitalization, protection and reporting of the intellectual capital;
- The creation of added value preponderantly from the capitalization of the resources of the knowledge-based firm;
- The reconfiguration of the credibility of financial accounting considering that the economic substance of the events and transactions originates in immaterial aspects and it is generated by the knowledge-based economy;
- The adaptation of the financial communication language and corporate culture to the types of innovative firm networks;
- The reconstruction of the structure and content of financial statements and the adaptation to the risks of a knowledge-based economy and to the vulnerabilities of the contemporary business environment.

5. Conclusions

The reasons behind this research theme resides in our interest in accounting and financial reporting in a knowledge-based economy and the discovery of the main vulnerabilities and raw spots of the classical, traditional accounting and financial reporting system. We live in a dynamic world, permanently adapting to new technologies, yet a world profoundly touched by the turbulences generated by the financial and economic crises which draw a series of changes of our perception of the role and functions of accounting and the financial reporting system. This fact was underlined by describing the ICT industry evolution in the past years. We intended in this work to link this dynamic that we have found in the ICT Romanian industry to the necessity of adjusting accounting and financial reporting of today to this major calls.

One of the challenges referring to the accounting and reporting of knowledge-based assets has in view the extremely delicate, even volatile nature of some of them as well as the fact that it is difficult to identify a direct relation between them and the financial indexes and it is not easy to determine the added value by the contribution of these categories of intangible assets, respectively. Therefore, we agree with Raj and Seetharaman (2012) who call for a review of the accounting standards for the contemporary financial reporting system must provide:

- continuous information instead of periodic reports;
- a future-oriented reporting opposed to the classical one, based on historical information;
- feasible assessments of information in fair values rather than based on historical costs;
- information provided via Internet and through other different modern communication ways instead of statements written on paper in the traditional format.

In agreement to those presented above, our paper intends to provide some considerations and invite to reflection regarding the usefulness of information in a knowledge-based economy and the position that accounting should have considering a considerable dynamics within the sphere of intangible assets and of the necessities to adapt the financial reporting system required. The main limits of our study are in regard to the study case and the discussion of results. This inconvenient will be diminish by future works that will concern financial reporting of knowledge assets in Romanian ICT industry and methods of measuring the value added by these type of assets.

Bibliography

- Andone, I. (2003) "Valoarea cunoașterii în societatea bazată pe competiție", *Revista Informatică Economică*, nr. 1 (25), <http://revistaie.ase.ro/content/25/Andone.pdf>, visited 27.01.2013.
- Brătianu, C. (2006) "Un model de analiză a capitalului intelectual organizațional", *Management & Marketing, Journal* no. 3, <http://www.managementmarketing.ro/pdf/articole/20.pdf>, visited 18.01.2013.
- Burja, C. and Burja, V. (2011) "Assessing the Knowledge Economy's Performance in Romania", <http://www.google.ro/books>, visited 2.12.2012
- Carayannis, E.G., Popescu, D., Sipp, C. and Stewart, M. (2006) "Technological learning for entrepreneurial development (TL4ED) in the knowledge economy (KE): Case studies and lessons learned", *Technovation* 26, pp. 419–443.
- Davenport, T.H. and Prusak, L. (2000) "Working knowledge", Harvard Business School Press, Boston.
- Drucker, P. (1993) "Post-capitalist society", Butterworth-Heinemann, Oxford.
- Heng, L.H., Othman, N.F., Rasli, A.M. and Iqbal, M.J. (2012) "Fourth Pillar in the Transformation of Production Economy to Knowledge Economy", *Procedia - Social and Behavioral Sciences* 40, pp. 530-536.
- Jones, A.B. (1999) "Knowledge Capitalism-Business, Work and Learning in the New Economy", Oxford University Press, Oxford.
- Lin, B.C. (2006) "A Sustainable Perspective on the knowledge Economy: A Critique of Austrian and Mainstream Views", *Ecological Economics* 60, pp. 324–332.
- Luban, F. (2005) "Formarea continuă și managementul cunoașterii", *Revista Economica. Seria Management*, vol. 8, nr.1, <http://www.management.ase.ro/reveconomia/2005-1/11.pdf>, visited 20.02.2013.
- Mansour, E., Mohammad, A. and Missi, F. (2008) "Validity of Accounting Models in the Knowledge Era", *European and Mediterranean Conference on Information Systems 2008 (EMCIS 2008)*, Dubai.
- McPhail, K. (2009) "Where is the ethical knowledge in the knowledge economy? Power and potential in the emergence of ethical knowledge as a component of intellectual capital", *Critical Perspectives on Accounting* 20, pp. 804–822
- Muntean, M., Danaiața, D. and Margea, C. (2001) "Managementul cunoștințelor în societatea bazată pe cunoaștere", *Informatică Economică Journal*, no 2 (18), <http://revistaie.ase.ro/content/18/danaiața.pdf>, visited 21.02.2013.
- Negucioiu, A. (2009) "Forța de muncă, resursele umane, capitalul uman în gândire și acțiune", http://www.history-cluj.ro/SU/anuare/2009/Continut/05_1_Negucioiu.PDF, visited 10.01.2013.
- Nicolescu, O. and Nicolescu, L. (2005) "Economia, firma și managementul bazate pe cunoștințe", Editura Economică, București.
- Feleagă, N. and Malciu, L. (2004) "Provocările contabilității internaționale la cumpăna dintre milenii. Modele de evaluare și investiții imateriale", Editura Economică, București.
- OCDE (1996) "The Knowledge-Based Economy", Paris, <http://www.oecd.org/science/scienceandtechnologypolicy/1913021.pdf>, visited 30.01.2013
- Raj J.R. and Seetharaman A. (2012) "The role of accounting in the knowledge economy", *African Journal of Business Management*, vol. 6(32), pp. 9307-9316,

available online: <http://www.academicjournals.org/AJBM>, ISSN 1993-8233 2012 Academic journals

Rooney, D. (2005) "Knowledge, economy, technology and society: The politics of discourse", *Telematics and Informatics* 22, pp. 405–422.

Sabău, G. (2001) "Societatea cunoașterii. O perspectivă românească", Editura Economică, București.

Sabău, G. (2010) "Know, live and let live: Towards a redefinition of the knowledge-based economy – sustainable development nexus", *Ecological Economics* 69, pp. 1193–1201.

Shapira, P., Youtie, J., Yogeessvaran, K. and Jaafar, Z. (2006) "Knowledge economy measurement: Methods, results and insights from the Malaysian Knowledge Content Study", *Research Policy* 35, pp. 1522–1537.

Stewart, T. (1998) "Intellectual Capital - The new wealth of organizations", Nicholas Brealey Publishing House, London.

Vuici, M. "Industria TI&C 2010-2011 – Sfârșitul crizei?", available online: www.itc.ro, site visited 16.01.2013.