

## Going on Digital: A Short Brief of the ICT Firms from Romania

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### Abstract

*The digital economy has become a topic of interest for many international organizations due to the fact that technological innovations dominate both individuals' activities and business organizations. Thus, the strategies of more and more companies have started to focus on the development of products / services that ensure the way of managing productive operations through the use of digital economy tools. From this point of view, we mention that the information technology has been gradually included in companies' current activities which concurs significantly to the efficiency of their operations. At the same time, it has increased the interest for hardware and software products, but also for other similar products that have changed the way of doing business. In this context, the activity related to the ICT sector is higher internationally, given the fact that the big economies of the world develop complex plans for the progress of the digital economy of the society.*

**Key words:** digital economy, information and communication technologies, innovation

**J.E.L. classification:** O33, M15, M19

### 1. Introduction

The changes from the business environment determine the business organizations to grant significant resources in order to discover innovative solutions that allow them to maintain a competitive position in the market. From this point of view, the innovative activity has become the central element of successful business organizations strategies. Given these facts, the digitalization is an option taken into consideration for many business organizations, which highlights the increasing role of companies in the ICT sector in the development of the digital economy. Their importance lies in the extent to which their products/services increase the digitization of the activity of other companies and even some public institutions. Thus, the innovations in the medical sector have changed the way of performing the medical act, given the fact their contribution in obtaining superior performances in the treatment of certain conditions. At the same time, the discovery of medicines / solutions used to cure certain diseases as a result of the digitization of certain operations has significantly improved the quality of life.

Regarding Romania, we mention that there has been a significant progress in terms of carrying out operations in which are involved the latest technologies, fact that had a significant contribution to the development of the ICT sector. This is the result of the presence of many foreign companies on the national market, but also of the increasing relations with foreign partners (outsourcing). Based on these considerations, the research aims to highlight the activity of the ICT companies, as a result of the increasing need for the organizations of any kind to exploit their resources and to obtain a high level of performance.

### 2. Literature review

The digital economy is closely linked to the knowledge economy based on knowledge, human resources and technology. Thus, we mention that successful business organizations will implement business models based on knowledge and technology in order to gain a competitive position in the market. One branch that stands out in the current context is that specific to knowledge-intensive

services that contributes to the creation and the development of knowledge in order to support the innovation process through the technologies provided by the ICT sector and through the application of new methods of organizing companies activities (Aslesen et. al. 2007, p.46).

Innovation is defined by both theorists and businessmen as the foundation of economic growth and long-term progress. From this perspective, businesses that include knowledge-intensive services are considered innovative business organizations because they have an innovative activity internally and at the same time implement strategies that support innovation (Doloreux and Laperrie' re, 2014, pp. 638-639). The decisions made within the company are focused on identifying solutions in order to improve current services/products, to develop new services / products, but also to identify new methods to carry out the specific operations of the company. A major position in this regard will have the technologies used, the research and development activity carried out by the company, the level of human resources training, etc. An important role in the development of the digital economy had the changes in the software and hardware area, but also the Internet, the mobile applications and broadband networks, which are considered the foundation of economies digitalization. In this context, the sector related to information and communication technology represents a driver for growth and innovation in the digital economy (OECD, 2015, p.85).

The development of the ICT sector worldwide has been based on the outsourcing by the big companies of a certain part of their activities. Thus, more and more multinational companies choose the collaboration with smaller companies from other states in order to make their activity more efficient (lower costs with personnel, well-trained human resources). The difficulties that the decision makers must face are related to the coordination of the operations, to the control of the delivery terms and the guarantee of a high quality of the services / products (Oshri et al., 2008, p.288).

Regarding digitization, we mention that there is no clear definition of the process, but the references to this process mention the use of data and the Internet, as well as the use of specific technical tools for carrying out operations within companies, within a state institution and even activities within one's own home (for example, using a certain equipment in order to manage the temperature by using an application that allows the control of the thermostat without being physically present, with one condition: a connection to internet).

Concerning the digital economy, we mention that this is defined most often as being made up of online platforms, but also of the activities that are provided by the existence of these platforms. At the same time, all operations involving digitized data are a part of the digital economy. From this point of view, some studies approach the subject of digital sector that includes activities that ensure the digitization process: online platforms, software production, hardware components production and other online applications (IMF, 2018, p.7). Some authors claim that the digitization has become a necessity for companies that want to be competitive on the world market. In this context, business organizations must be creative and effectively include disruptive technologies in their activities. Thus, employees use laptops and smartphones to perform their tasks, access information from the cloud (a way of storing company data and information, or ask for feedback from a crowd (a help desk where real-time solutions can be identified) for certain problems) (Andriole et al, 2018, pp.68-69).

Some studies underline that the use of ICT tools by companies supports a better position in the market, reducing production costs and increasing productivity. Moreover, the use of such methods can entail the diversification of the product range, and also can improve its ability to better respond to market demands. In fact, these tools can help companies to improve their ability to innovate (OECD, 2003, p.11). Given these facts, we mention that such methods ensure a high level of performance that will definitely support other investments and also new innovations.

Regardless of the perspective of the analysis on the changes that will be registered in the world economy as well as of the solutions that can be applied, we observe that they are largely influenced by the level of knowledge. ICT products/services depend on the level of knowledge, but also on the experience of human resources within the companies that carry out operations in this field. Thus, within the knowledge-intensive companies are developed products/services based on a higher level of knowledge. The base of the development of these companies is represented by the competences of their employees fact that will be highlighted in the development of innovative products /

services. From this point of view, a large part of the employees will have academic training / higher education as well as a specific experience (Alvesson, 2004, p.26).

Knowledge transfer within business organizations takes place through IT tools that provide the necessary methods to store and transmit explicit knowledge (Jennex, 2007, p.14). In this way, the specific the processes /operations specific to companies are efficient, since the human resources have access to all the information necessary to fulfill their tasks. Moreover, the use of such tools allows the request of expertise from other areas, thus increasing the chances of identifying the optimal solutions for certain problems in a very short time.

Technology development, the accessibility of information, as well as the efficiency of the communication processes, have determined a significant increase of the international trade, but also of the investments due to the large number of countries participating on world markets (North et al, 2014, p.39). From this perspective, the ICT sector had an important contribution to the economic development of the states of the world.

### 3. Research methodology

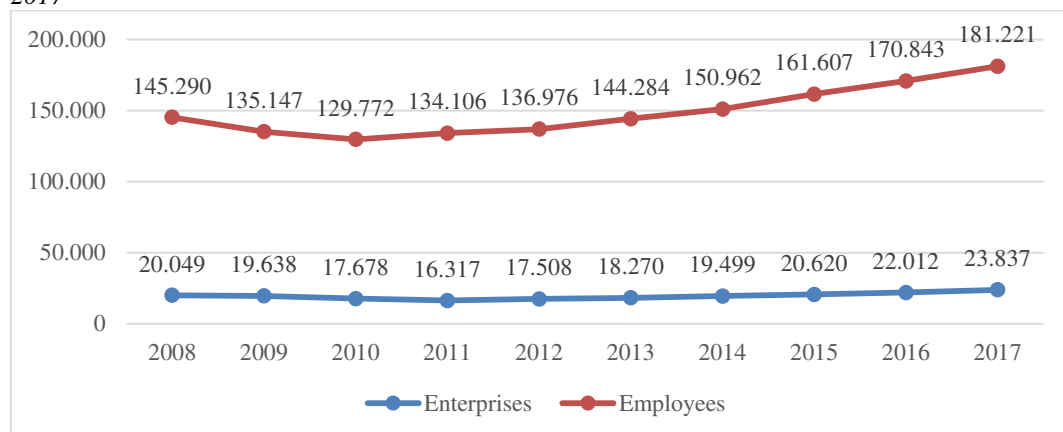
The purpose of this research is to highlight the key sectors in which business organizations have an intense innovative activity in the context of digital economy development. At the same time, the aim is to analyze the evolution of the ICT sector in Romania and the impact of these companies activity on the growth of the national economy.

In order to accomplish this paper, it was considered both the use of qualitative instruments sometimes, as well as of quantitative tools in order to ensure an optimal framework for the analysis. Thus, on the one hand, the attention was focused on studying works in the existent literature in order to create an overview on the studied aspects, as well as to determine the level of knowledge in the field. On the other hand, we decided to analyze some specific indicators that reflect the position of the ICT sector in the national economy. The research is based on statistical data available on the specific platforms of the National Institute of Statistics. For all the indicators studied, a period of at least 10 years was taken into consideration in order to outline a trend regarding the evolution of the ICT sector in Romania.

### 4. Findings

The Romanian business environment has changed significantly in the recent years due to the evolution of technology that has been used both by the business organizations but also by central and local government institutions. Thus, has been made significant progress in many sectors of activity, mostly in the ICT sector. Moreover, currently, some specialists find Romania as a Europe Silicon Valley. That is a fact given the number of companies that carry out activities related to this field has increased quite a lot in recent years. In the table below we give an overview of the sector, considering the number of existing companies as well as the number of employees within them:.

Figure no. 1 The evolution of ICT sector given the number of enterprises and employees during 2008-2017

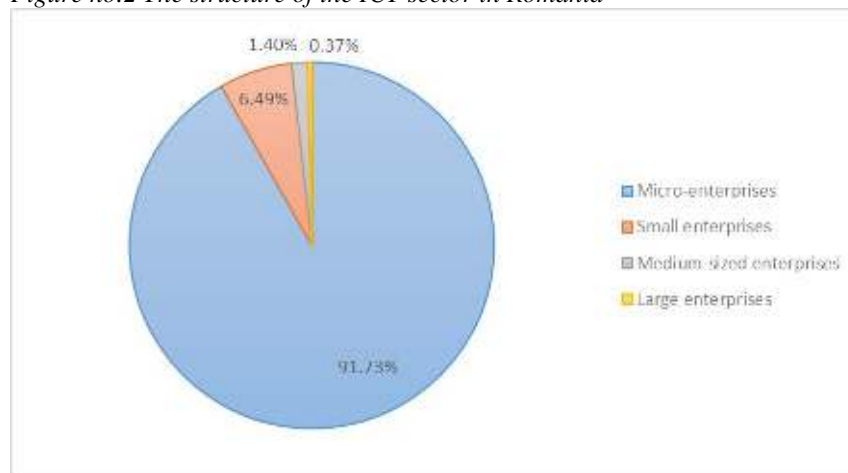


Source: Data processed by the author using The National Institute of Statistics database

The data available from the National Institute of Statistics shows that the number of companies in the ICT sector in Romania has increased significantly during the analyzed period. Thus, in 2017 the number of economic agents operating in this sector increased by about 20% compared to 2008. At the same time, the number of employees in the economic entities from this sector increased by about 25% in 2018 compared to 2008. The data available for 2018 shows that companies like ORACLE (4,463 employees), IBM (3,207 employees), Ericsson Telecommunications (2517 employees) and Endava (2,275 employees) have the highest number of employees. Although the financial crisis of 2008-2009 has also affected this sector, we observe that starting with 2012, the predominant trend that characterizes the evolution of both indicators is increasing. Regarding the concentration of businesses in this sector we mention that the largest number of companies, specific to this field, are in the city of Bucharest (9135 companies), Cluj county (2,127 companies), Timiș county (1036 companies) and Iași (949 companies), according to the available data for the year 2017. This is a result of the fact that these cities are also the largest university centers in Romania, providing companies access to well-trained human resources in various fields, not just the technical ones. Thus, in recent years the number of graduates in the field of information and communications technology has also increased significantly as a result of the increasing demand of employees for companies in the ICT sector. For example, in 2017 the number of graduates of higher education in this field was 10% higher than in 2016. The level of training of the human resource at national level in this field, as well as the reduced costs with the salary expenses had a great influence on the decisions of many multinational companies to carry out operations in Romania. To these motivations are added the high quality of the software products created by the Romanian companies in the field, an aspect that was the basis for establishing various partnerships.

Regarding the structure of the sector we present in the figure below the situation in the year 2017, taking into consideration the methodology of the EU to define the SMEs given the number of the employees.

Figure no.2 The structure of the ICT sector in Romania



Source: Data processed by the author using The National Institute of Statistics database

According to the data presented, we can notice that most of the companies that carry out operations specific to the ICT sector are microenterprises. Thus, over 90% of the economic entities existing in this economic branch have up to 9 employees. Some studies regarding the EU business environment highlights that most of the economic agents at the European level are micro-enterprises. Regarding large companies (economic entities with over 250 employees) we can mention that these businesses represent only 0.37% of the sector as a number. At the same time, the most representative economic players in the Romanian ICT market are dominated by multinational companies such as IBM, ORACLE, Endava, Microsoft or SAP, companies with a strong global position.

In order to give an overview of the results obtained by the companies in the ICT sector in Romania, we present in the figure below the evolution of these businesses turnover during the period 2008-2017.

Figure no.3 The evolution of ICT firms turnover during 2008-2017

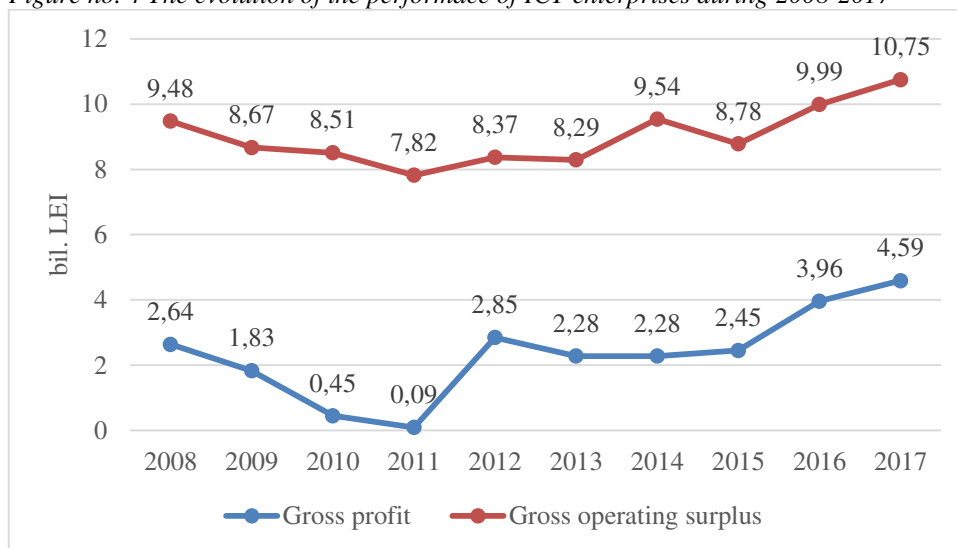


Source: Data processed by the author using The National Institute of Statistics database

According to the presented data, we observe that the predominant trend regarding the turnover is related to a high increase. Thus, in 2017 the incomes of business organizations in the ICT sector increased by 6.94% compared to 2016 and by about 48% compared to 2008. We also mention that the value of the revenues obtained by the companies in the ICT sector recorded the lowest value in the period after the financial crisis.

Other aspect highlighted for the purpose of analyzing the performance of the companies in the studied area are the gross result and the gross operating surplus. Therefore, we present in figure no.4 their evolution in the period 2008-2017.

Figure no. 4 The evolution of the performace of ICT enterprises during 2008-2017



Source: Data processed by the author using The National Institute of Statistics database

Regarding the presented indicators we can mention that they have a predominant growth trend, however, there is a short period of decline in the years preceding the financial crisis (2009-2011). The decrease period of the sector was short, being successfully exceeded by the companies in the field, given the high values obtained in the following years. Moreover, in 2012, the gross result obtained by the entities that carry out operations in the ICT sector was higher than before the financial crisis. Regarding the gross operating surplus, we find that in 2017 it registered the highest value, being about 13% higher compared to 2008. The high value of this indicator underlines the high capacity of self-financing of companies in the sector. At the same time, the gross operating result showed a similar evolution, given the fact that the value registered in 2017 was about 74% higher than the one obtained in 2008. The high values of the analyzed indicators indicate the rise of

the ICT sector as well as the high performance obtained as a result of strategies implemented by the management of these companies regarding the innovative activity.

Regarding the activity of the companies studied on the international markets, we present in figure no.5 the evolution of the export related to the sector during the period 2008-2017.

Figure no.5 The evolution of ICT firms export during 2008-2017



Source: Data processed by the author using The National Institute of Statistics database

As respects the presence of the Romanian ICT firms in foreign markets, we can mention that this has increased significantly in recent years. Thus, the value of exports registered in 2017 was about 300% higher than that registered in 2008. The high value of the exports is due, in large part, to the presence of many multinational companies, that have a competitive position worldwide, on the national market. In fact, the available data shows that the activity in the ICT national is ruled by foreign capital companies. At the same time, Romanian companies have also developed, which have asserted themselves on foreign markets through tools such as outsourcing. Moreover, recently, some domestic companies in the field have succeeded in offering innovations that give them competitive positions on the world market (Bitdefender, UiPath, Arobs Transylvania, etc.).

## 5. Conclusions

The increasing importance of the services specific to the ICT sector in carrying out the operations of the companies will intensify the activity of the business organizations involved in developing software, computer applications or other different products that ensure the efficiency of some processes. Moreover, technologies evolution will play a major role in eliminating the problems that is facing the society. Regarding the activity of ICT companies in Romania, we can conclude by mentioning that they have achieved a significant performance, contributing to the growth of the national economy by creating jobs and increasing the innovative activity

Although, at present, foreign companies dominate the national market, significant progress has been made regarding the development of Romanian start-ups in this sector. An important role was played by the European financing programs that facilitated the access to non-reimbursable funds for the development of the activity of the companies in the field. At the same time, the establishment of specific clusters in the field (Cluj IT Cluster, EURONEST IT&C HUB, iTech Transilvania Cluster, etc.) was reflected in the increase of the competitiveness of the Romanian companies on the global ICT market.

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