THE ROMANIAN ENTERPRISES' ITCs USAGE IN EU28 CONTEXT

BABUCEA ANA-GABRIELA,
PROF. PHD.,"CONSTANTIN BRÂNCUŞI" UNIVERSITY OF TÂRGU JIU,
e-mail: gabibabucea@gmail.com

Abstract

Globalization, the Internet, mobile telephony and the new Information and Communication Technologies (ITCs), which are in continuous process of developing, have enabled individuals, organizations and governments around the world to communicate and interact with each other through a global network. The continuous increase in the number of users increases the value and benefits of this digital integration and create new opportunities for organizations and individuals through the free circulation of information in the fields of economic and social activities, and political, too. However, regardless of the advantages, benefits, and opportunities offered, digital integration depends directly by the availability of network access, the level of training of the ICTs workforce, and the labor market opportunities for those with such abilities and knowledge. It is a fact that a lot of enterprises reduced their costs and increased their profit because many activities are partially made by the company's clients, by themselves. The companies' partners and customers are in a continuously changing in this new business ecosystem, a digital one, where the customers are put at the center of the business. For exit from the industrial age and adapted their self to the new digital era, the enterprises have to use the opportunities of the digital economy by a process of digital transforming which need to see and use the information as a business basic resource with digital business networks and processes automation. Based on EUROSTAT data specific indicators of the digital economy, the paper aims to analyze comparatively the extent to which the business environment in Romania and other EU states develop and implement initiatives in ICT, digitally transforms business processes and labor for competitiveness into the digital economy.

Keywords: *Digital economy, enterprises, connectivity, e-business, Romania, UE 28*

Classification JEL: *L86*

1. Introduction

The new Internet technologies have opened the way for a new economy, the digital economy where access to and use of the Internet is the key to a successful business. In the last years, the global economy go through a new transformation, a digital one. As ITCs becomes much cheaper and faster, easier to use by the people, the organizations can find new uses for these new technologies, integrating digital applications and information systems by connecting them with increasingly wireless technology. Atkinson and McKay considered that "the integration of IT into virtually all aspects of the economy and society is creating a digitally enabled economy that is responsible for economic growth and prosperity" [1].

Digital technologies have changed the businesses and will do so in the future, too. The technologies as Cloud, Big Data, artificial intelligence, mobile, Internet of Things and more other recent emerging technological realities, and global interconnection have generated hypercompetition among the organizations, which determinate an hypercompetitiveness over de business environment. This means billions of online connections between people, organizations, devices, data and processes, in the other words a digital economy. It all comes down to the extent to which ITC are involved in the way companies interact with each other, or how consumers get services, information, or goods. All those generated new methods of doing business, another type of relationships among the enterprises, their partners and clients.

Nevertheless, the accelerated rhythm with which ITC technologies develop far exceeds the rhythm of adopting them and transformation into organizations. The evolution of the technologies is an enabler of digital business transformation but at the same time is the cause of digital transformation needs. By adoption, ITC becomes catalyzer of innovation. The literature on the

topic emphasize that by using ITC exist different ways to digital business transformation, but always improved business processes.

To remain relevant in front of the quickening pace of technology advances, the digital transformation must create a better collaboration between employees to work together more effectively and boost productivity; a rapid interaction with customers thus ensuring their retaining and gain new others, effective relationships with business partners, and increased agility via different work styles. All these drive down the costs, improve the business processes, and gain an edge over their competitors.

Digital Transformation offers to customers a different model of business, continuously improved, based on data, information, and knowledge, which enables to deliver better and innovative products or services. Databases, smart devices, and other digital tools can monitor daily processes and measure the customer's satisfaction and the way of interacting with the new products and services. That offer rapid actionable insights about the business, and software-development permit to act with a rapid pace of business, faster than their competitors do. For that are useful IoT solutions, Data Analytics solutions, and not at least software-development. The digital transformation of the enterprises is very important as „the firms, no matter the field they work (tourism, industry, services, etc.), can create a competitive advantage on the market, and can also increase productivity and efficiency in the context of globalization" [2].

Eurostat storages data about more than 100 key indicators, grouped by subject, to measure the European digital economy and society, and allow a comparison of the European countries progress, across them, as well as over time [3], so it is easy to note that the process of digital business transformation is not uniform across the European countries. In this regard, the European Commission has adopted on May 2015 a Digital Single Market strategy with the aim of "opening up digital opportunities for people and business and enhancing Europe's position as a world leader in the digital economy" [4], but there are major gaps between the EU Member States that use technology in different ways to digital integration.

There are many organizations unable to maintain the pace with this transforming asked by the new digital era because their managers still have not a clear strategy about their digital transformation endeavors [5]. Unfortunately, Romania's business organizations are such an example. Globalization has especially brought about the globalization of business relations, so that, the Romanian economy will be count in the European and world space, only if a digital transformation of the business environment and an increase in the number of organizations disturbed by the digital progress are registered. As a part of the common market of the European Union, Romania "has the potential to capitalize upon the opportunities presented by the digital economy through encouraging its small and medium sized enterprises to engage in digital transformation that can increase their" [6]. But, in the recently Romania's "Digital Economy and Society Index (DESI[1])" Country Report for the year 2018, it is remarked that regarding the integration of digital technologies by businesses, „Romania remains at the bottom of the ranking and is not progressing„. The indicator "Integration of Digital Technology" measures the digitization of businesses by adopting digital technologies [7]. (See Table no. 1).

Table no. 1. **Integration of Digital Technology**

Year	Romania		Cluster	EU
	rank	score	score	score
DESI 2018	28	17,8	29,2	40,1
DESI 2017	28	18,6	26,7	36,7

Source: Digital Economy and Society Index 2018, Country Report Romania [6], p.8.

[1] The Digital Economy and Society Index (DESI) is a composite index that summarises some 30 relevant indicators on Europe's digital performance and tracks the evolution of EU Member States, across five main dimensions: Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, Digital Public Services.

2. Romanian business environment current situation concerning the ITCs usage

In order to describe the actual stage of ITCs usage in Romanian enterprises in the EU context we considered the recent Eurostat data regarding digital economy and society with the main indicators of ITC usage in enterprises, grouping in two categories: a. Connection to the Internet and b. E-Business.

2.1. Connection to the Internet

Data and connectivity are absolutely necessary for digital business transforming. Collecting data is key in information era, and connectivity is necessary for data collection [8]. By connecting IT infrastructure though the Internet and analyze the data extracted from databases, new insights can be discovered and new models that support management and customers' needs. The literature in the subject highlights the role of the Internet in the enterprises' marketing distribution, business processes, and market intelligence, competitor analysis or in their internationalization [9].

According Eurostat studies, in 2017, "the vast majority (93 %) of enterprises in the EU-28 with at least 10 persons employed made use of a fixed broadband connection to access the internet" [10]. In the maps from figure no. 1, are presented clusters of European countries regarding enterprises with broadband access, key indicator which measure the connection to the Internet. Eurostat data considered are regarding the percentages of enterprises (with at least 10 persons employed) with broadband access, registered in the year 2017, grouped in six different clusters. Enterprises are connectable to an exchange, which has been converted to support xDSL-technology to a cable network, upgraded for internet traffic, or to other broadband technologies. It includes fixed and mobile connections.

Even if the connectivity is essentially base to make the digital transformation, as can note, Romania is placed in the cluster with the lowest percentage (82-95 % of the enterprises), the largest one, and contenting 13 states. Remark also Denmark, Lithuania, Netherlands, and Finland with 100 percentage of enterprises that are connectable. Even so, Romanian enterprises made large steps in this way. The evolution of the percentage of enterprises that are connectable had a positive trend profound and rapid acceleration in the last years, from 31% in 2006 to 82% in 2017.

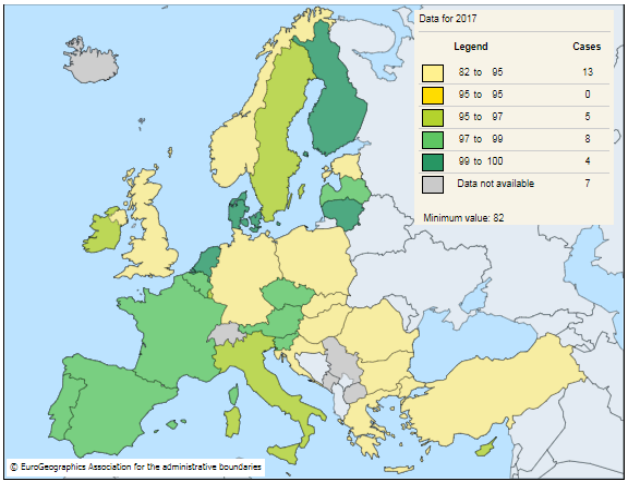

Figure no. 1. Connection to the Internet - Enterprises with broadband access (2017)

Source: Generated by the author with Eurostat Tool TMG using data with Codes: tin00090 and [tin00125]

The connection to the Internet is not only providing great benefits for business communication being the easiest way for a business to connect with customer and partners, but the

high-speed internet is also used by business organizations to speed up all business processes. „Business information is fastest than ever. The Internet is now the backbone of offline business to sell online. And the internet is a heart for online business" [11].

Although with a very low connectivity, Romania's country profile for the relative position against all other European countries for the indicator "broadband speeds" for the year 2017 is a very good one. (See Figure no. 2).

In the figure below, the chart's bars represent the relative position of Romania on the key sub-indicators of the considered indicator, compared on a common scale with the lowest, average and highest European Union 28 countries' values. Remark that Romania performs above EU average and more near to the maximum values among EU countries.

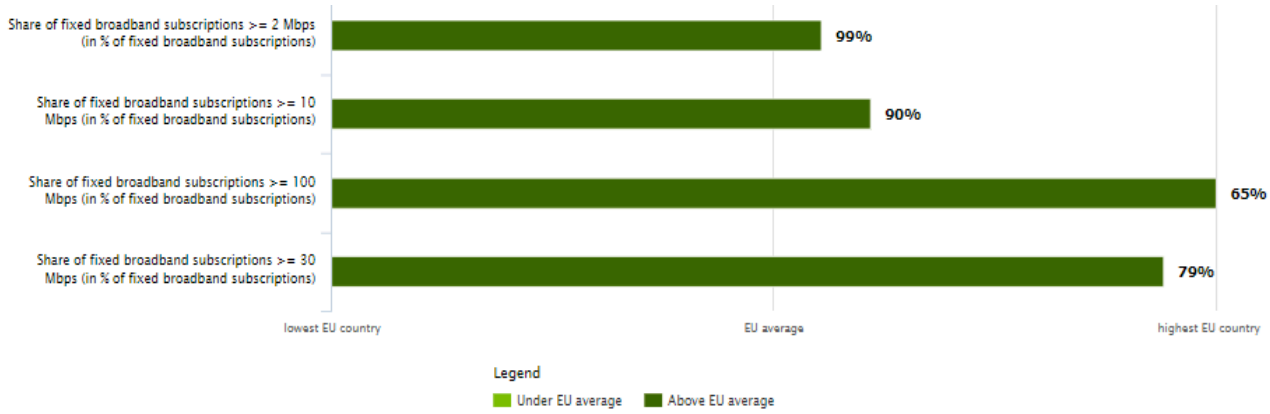

Figure no. 2. Country Profile for Romania – Broadband speeds, year 2017

Source: Generated by the author with Eurostat Digital Scoreboard Tool: https://digital-agenda-data.eu/charts/country-profiles-the-relative-position-against-all-other-european-countries#chart={%22indicator-group%22:%22bbquality%22,%22ref-area%22:%22RO%22,%22time-period%22:%222017%22}

The following table presents the evolution of the sub-indicators for Romania in the period 2014-2017, compared to EU 28 values for the year 2017, and the ranked value of Romania among EU 28 countries. Remark the lower ranks indicate a top level performance for Romania.

Table no. 2. **Broadband speeds Romania's country profile – Country ranking situation**

Indicator (including breakdown and unit)	Romania value				EU28 value	Romania rank among EU28 countries
	2014	**2015**	**2016**	**2017**	**2017**	**2017**
Share of fixed broadband subscriptions >= 10 Mbps - Total (in % of fixed broadband subscriptions)	84	86	89	90	87	12
Share of fixed broadband subscriptions >= 100 Mbps - Total (in % of fixed broadband subscriptions)	47	49	56	65	20	1
Share of fixed broadband subscriptions >= 2 Mbps - Total (in % of fixed broadband subscriptions)	99	99	99	99	99	16
Share of fixed broadband subscriptions >= 30 Mbps - Total (in % of fixed broadband subscriptions)	57	63	75	79	44	2

Source: Selected data from European Commission, Digital Scoreboard, https://digital-agenda-data.eu/charts/country-ranking-table-on-a-thematic-group-of-indicators#chart={%22indicator-group%22:%22bbquality%22,%22ref-area%22:%22RO%22,%22time-period%22:%222017%22}

But, this paradoxical situation for Romania can be explain. According to the International Telecommunications Union - the UN's Information and Communications Agency, there are some reasons why Romania's internet speeds are so high [12]:

- Only 50 percent Internet penetration rate,
- The population density permits an easier delivering of super high speeds,
- The way was resolved the demand for high-speed internet when it started to grow in Romania by launch small neighborhood networks,

At the level of the European Union, almost all enterprises are connected to the internet via broadband, so the recently aim in business digital transformation is "switching to the uptake of mobile internet connections (as enterprises increasingly equip their staff with portable computers, smartphones and other mobile devices) and to the speed of fixed broadband connections" [10].

The portable devices with at least technology for accessing the internet are very important, but need mobile connection for business through mobile telephone networks; the enterprise pays for all or at least up to a limit the subscription and the use costs. All of these provide insights to deliver business solutions as the Internet of Things (IoT) and so, new models that support the business partners and customers' digital business needs.

Figure no. 3 presents clusters based on data about enterprises giving portable devices for a mobile connection to the internet to their employees at the level 2017.

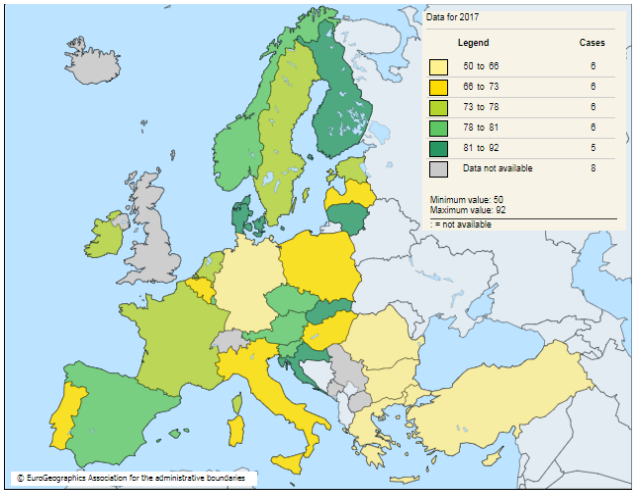

Figure no. 3 - Connection to the Internet - Enterprises giving portable devices for a mobile connection to the internet to their employees (2017)

Source: Generated by the author with Eurostat Tool TMG using data with Codes: tin00090 and [tin00125]

Romania remained in the last cluster with only six countries. Remark Croatia and Spain with very high percentages, over 80. Nevertheless, with only 50% of enterprises, the lowest percentage in 2017, Romania had made a remarkable increase from 39% in 2014.

2.2. Romania country profile regarding E-Business - the relative position against all other EU countries

For developing and integrating e-business solutions, the accessing to the internet is the basic concerning the internet's possibilities of connecting enterprises and people all over across the world. From this point of view, Romania as a country positioned on one of the last positions in Europe has further steps to extend connectivity as a prerequisite for e-business integration.

Analyze the category of E-business is very important, too, because "the nature, scope, and impact of e-business technologies are connected with development of ICT" [13]. This category

include three indicators: percentage of enterprises using radio frequency identification (RFID) instrument; percentage of enterprises whose business processes are automatically linked to those of their suppliers and/or customers; and percentage of enterprises using software solutions, like CRM to analyze information about clients for marketing purposes. The situation of Romanian enterprises comparing with the other European countries performance, are presented below.

Regarding the enterprises using radio frequency identification (RFID) instrument – (% of enterprises with at least 10 persons employed in the given NACE sectors) the available data, for 2017, placed Romania in the last cluster, too, with only 7%, compared with countries like Belgium or Finland with more than 20% (See Figure no. 4). According to the Eurostat definition, RFID means an automatic identification method to store and remotely retrieve data using RFID tags or transponders. A RFID tag is a device that can be applied to or incorporated into a product or an object and transmits data via radio waves.

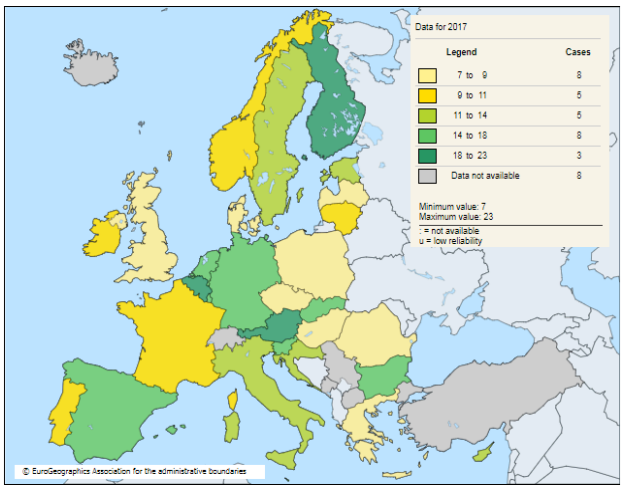

Figure no. 4. E-Business - Enterprises using radio frequency identification instrument (2017)

Source: Generated by the author with Eurostat Tool TMG using data with Code [tin00114].

The same situation are for the second indicator, too. The percentages of the Romanian enterprises, whose business processes are automatically linked to those of their suppliers and/or customers, placed it in the last class, with only 7%, value. The best performance means 30% for Germany (See Figure no. 5).

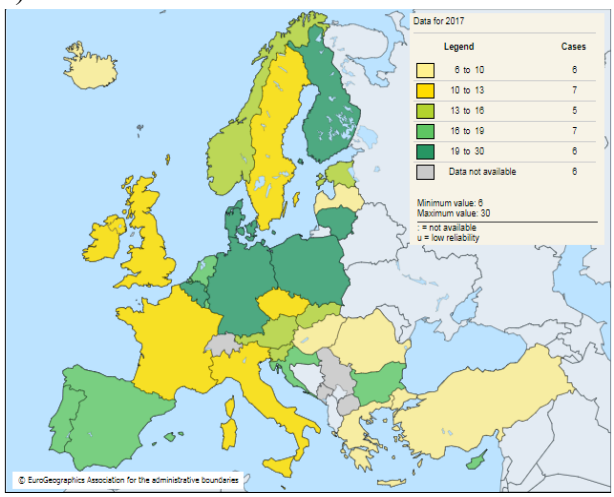

Figure no. 5. E-Business - Enterprises whose business processes are automatically linked to those of their suppliers and/or customers (2017)

Source: Generated by the author with Eurostat Tool TMG using data with Codes: [tin00115].

This is a very important indicator to measure the digital transforming, and according Eurostat, it is referred to "sharing information electronically on the Supply Chain Management under the following aspects:

- Exchanging all types of information with suppliers and/or customers in order to coordinate the availability and delivery of products or services to the final consumer;
- Including information on demand forecasts, inventories, production, distribution or product development;
- Via computer networks, not only the internet but also other connections between computers of different enterprises;
- Excluding normal e-mail messages manually written".

The third indicator of E-business measured by Eurostat, enterprises using software solutions, like CRM (Customer Relationship Management) to analyze information about clients for marketing purpose, is no better for Romanian enterprises situation. CRM refers from a certain point of view to technologies designed to attract, retain, and fidelize customers.

In a broad sense, CRM includes automating the activities of marketing, sales, financial and technical support departments related to customers, potential customers, suppliers, and partners. In the cluster with the lowest performances (including seven countries), Romania, with 11% of enterprises is better only from Hungary or Iceland. The best performances note to Netherlands with 28 % and Cyprus with 29 % (See Figure no. 6).

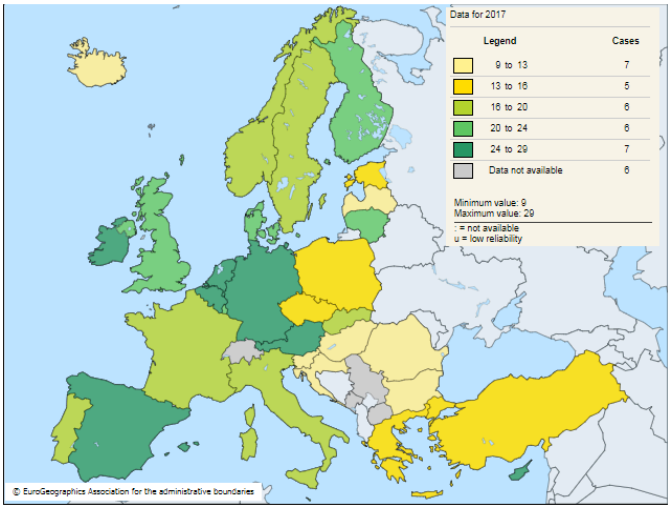

Figure no. 6. E-Business - Enterprises using software solutions, like CRM to analyze information about clients for marketing purpose (2017)

Source: Generated by the author with Eurostat Tool TMG using data with Code [tin00116]

Romania's performance is well below the EU average in terms of e-business, but for more of sub-indicators of the category, has made progress compared to last recent years, especially for SMEs, as can note in table no. 3.

The table below presents the recent years evolution of Romania on the main sub-indicators of E-business, ranking Romania among the other 27 European Member States. As regards the results presented in the table, may remark the higher ranks indicate for Romania which mean that the other countries have better positions with better values

Table no. 3. **E-business Romania's country profile – Country ranking situation**

Indicator (including breakdown and unit)	Romania value				EU28 value	Romania rank among EU28 countries
	2014	**2015**	**2016**	**2017**	**2017**	**2017**
Integration of internal processes (with an ERP) - SMEs (10-249 persons employed) (in % of enterprises)	20	21	-	16	33	27
Persons employed provided with a portable device by their enterprise - All enterprises (in % of total employment)	10	10	12	15	23	24
Cloud computing services (medium-high sophistication) - All enterprises (in % of enterprises)	3	6	5	6	-	15
Enterprises paying to advertise on the internet - All enterprises (in % of enterprises)	-	-	12	-	-	-
Use of analytical CRM software - SMEs (10-249 persons employed) (in % of enterprises)	13	15	-	10	20	27
Enterprises with High levels of Digital Intensity - SMEs (10-249 persons employed) (in % of enterprises)	-	11	8	11	20	25
Enterprises providing portable devices to > 20% of their employed persons - All enterprises (in % of enterprises)	11	11	15	16	32	27
Enterprises sending e-invoices - All enterprises (in % of enterprises)	7	-	9	11	-	13
Enterprises using RFID for product identification - All enterprises (in % of enterprises)	4	-	-	2	4	24
Electronic Supply Chain Management - SMEs (10-249 persons employed) (in % of enterprises)	8	9	-	6	17	27
Enterprises using social media - All enterprises (in % of enterprises)	22	25	30	35	47	25
Enterprises having a website with some sophisticated functionalities - SMEs (10-249 persons employed) (in % of enterprises)	-	42	40	43	58	24

Source: Selected data from European Commission, Digital Scoreboard https://digital-agenda-data.eu/charts/country-ranking-table-on-a-thematic-group-of-indicators#chart={%22indicator-group%22:%22ebusiness%22,%22ref-area%22:%22RO%22,%22time-period%22:%222017%22}

In the figure below, the chart's bars represent the relative position of Romania on the key sub-indicators of E-business, compared on a common scale with the lowest, average and highest European Union 28 countries' values.

The figure allows to remark that Romania performs under EU average and more near to the minimum values among EU countries.

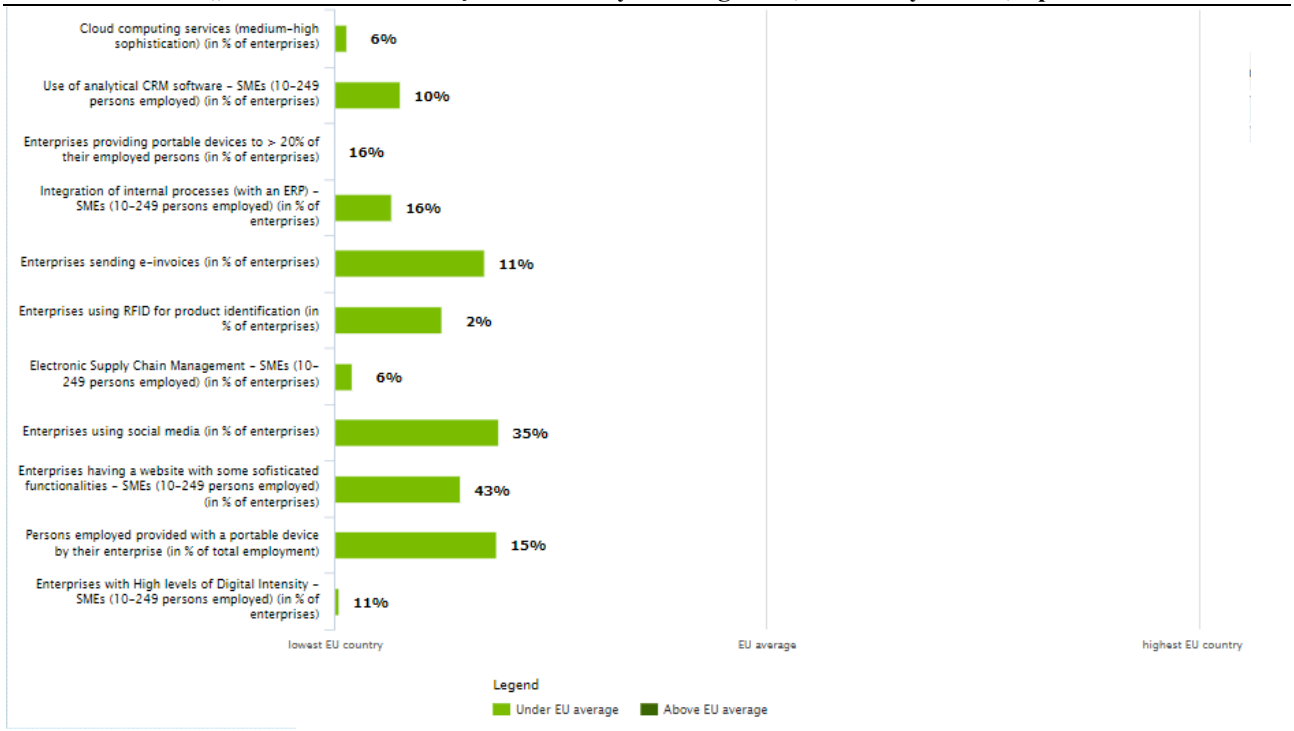

Figure 5 - Country Profile for Romania – E-Business Indicators, year 2017

Source: Generated by the author with Eurostat Digital Scoreboard Tool. https://digital-agenda-data.eu/charts/country-profiles-the-relative-position-against-all-other-european-countries#chart={%22indicator-group%22:%22ebusiness%22,%22ref-area%22:%22RO%22,%22time-period%22:%222017%22}

3. Conclusion

As noticed from the aforementioned comparative analyses may conclude that there are major differences yet between the ITCs usage in Romanian enterprises compared to that of EU-28. Digital business transformation means a radical transformation of businesses, processes, skills, business and organizational models to adopt the changes and opportunities of the new digital technologies, and implies on society in a strategic manner.

Romanian companies are still shy about ITCs use, and it is only the first step in digital business transformation. The legislation must encourage the adoption and use of these technologies such that enterprises, private companies, and public administration use these technologies to interrelate with each other. The managers must to reinvent their businesses and use the technology, modernize IT infrastructure, access to platforms or cloud-computing services to give high-value business capabilities and improve the organization performances and services for its clients, increase the business efficiency, and make decisions easier, because the future economy will be a digital economy.

4. Bibliography

[1] **Atkinson, R.D., Mckay, A.S.,** (2007). Digital prosperity - Understanding the Economic Benefits of the Information Technology Revolution. Information Technology and Innovation Foundation. Available at https://www.itif.org/files/digital_prosperity.pdf

[2] **Gabor, M. R., Cîmpian, L.** (2015). Comparative study regarding development of information society in Romanian enterprises. A multimethod analysis. Ecoforum Journal, 4, Special Issue 1, pp.218-225.

[3] *** Digital Single Market- Digital Agenda key indicators. European Commission. Available at

https://digital-agenda-data.eu/datasets/digital_agenda_scoreboard_key_indicators/indicators
[4] *** A Digital Single Market Strategy for Europe. European Commission. 6 May 2015.
[5] **Hess, T., Matt, C., Benlian, A., Wiesböck, F**., (2016). Options for Formulating a Digital Transformation Strategy. MIS Quarterly Executive, 15(2). Available at http://misqe.org/ojs2/index.php/misqe/article/viewFile/645/424
[6] **Toanca, L.,** (2016). Empirical Research Regarding the Importance of Digital Transformation for Romanian SMEs. Management and Economics Review, 1(2), 92-108.
[7] *** Digital Economy and Society Index 2018, Country Report Romania, European Commission, 2018, Available at http://ec.europa.eu/information_society/newsroom/image/document/2018-20/ro-desi_2018-country-profile_eng_199394CB-B93B-4B85-C789C5D6A54B83FC_52230.pdf
[8] **Goudet, J.,** Navigating the back roads of digital transformation: connectivity and data, Available at https://www.al-enterprise.com/en/blog/digital-transform-connectivity-data
[9] **Loane, S.J**., (2005). The role of the Internet in the internationalisation of small and medium sized companies, Journal of International Entrepreneurship, Volume 3, Issue 4, pp. 263–277.
[10] *** Digital economy and society statistics – enterprises. Eurostat statistics explained - Online publication. Available at https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_enterprises&oldid=342990
[11] **Sharma, V.,** (2016). Importance of Internet in Business. Available at http://www.klientsolutech.com/importance-of-internet-in-business/
[12] **Rogers., K.,** (2015). Why Romania's Internet Is So Much Faster Than America's - A uniquely Romanian phenomenon enabled the Eastern European nation to enjoy some of the fastest Internet speeds in the world. Available at https://motherboard.vice.com/en_us/article/jp5aa3/why-romanias-internet-is-so-much-faster-than-americas
[13] **Petrtyl, J., Eger, L.** (2015). A comparison of ICT use (e-business tools) in companies of selected countries, Trends in Business - a scientific journal of the Faculty of Economics, University of West Bohemia in Pilsen, 5(20), pp.59-72. Available at https://www.dfek.zcu.cz/tvp/doc/2015-2.pdf

ACKNOWLEDGMENT: This work is partially based on the paper "*Digital transformation in Romania – the ITCs usage in Romanian enterprises*" presented by the author in International Scientific Conference ECOTREND 2018, XVth Edition, "Convergence/Divergence in the European Economic Area", October 26-27, 2018, Târgu Jiu, Romania.