STUDY ON THE DIGITIZATION LEVEL OF ROMANIAN ENTERPRISES

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Abstract: *The low level of enterprise digitization prevents productivity improvements. By addressing the main digital technologies included in the digital intensity index, Romania is among the three EU Member States, with the lowest proportion of enterprises with high digital intensity. Although the percentage of enterprises with a very high digital intensity is superior to those in the equivalent Member States and is close to the EU average, the digital competencies of the labor force are among the lowest in the EU. Despite the existence of a large number of qualified ICT specialists, workers in the labor market generally lack digital competencies, which affect the level of productivity of Romanian enterprises. Taking into consideration these general coordinates, the study aims are: determining the position occupied by Romania in the EU, identifying the causes leading to the low level of digitization, determining the influence on productivity and finding growth solutions.*

Key words: *enterprise digitization, digital technologies, digital intensity*

1. INTRODUCTION

The study aims to determine the stage of digitization of Romanian enterprises. Stages in the research are: identification of digital technologies, comparative analysis between Romania and the European Union, identification of the causes that led to the evolution of digitization in Romania, finding solutions for increasing the analyzed aspects.

2. RESEARCH ORGANIZATION

The necessity of studying the issue of the article was constituted by the position that Romania holds in the EU in terms of the economy and the digital society. The benchmark was the economy and digital society index (DESI). Calculated annually, aims to measure the progress made by an EU Member State, in the development of an economy and a digital society. DESI is a tool for detailed analysis of national digital policies, giving an overview of the progress and implementation of policies by the Member States. In order to evaluate member states results, DESI allows comparative analyzes between countries in the following areas: connectivity, skills, internet use, adoption of digital technology by enterprises, digital public services, investment in information and communication technology. The Digital Economy and Society Index (DESI) is a composite index published every year by the European Commission. Since 2014, the index measures progress of EU countries towards a digital economy and society, bringing together a set of relevant indicators on Europe's current digital policy mix [1]. The DESI is composed of five principal policy areas which regroup overall 34 indicators presented in Table 1. Romania is on the last position among the 28 EU member states in DESI 2018. Although it stayed the same as in 2017, its score has increased thanks to a performance

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improvement in four of the five dimensions of the DESI index. Overall, progress in the past year has been slow, and Romania has failed to catch up with other countries.

Current number	Policy areas	Percent of DESI Composite	Indicator
1	Connectivity	25	Fixed broadband, mobile broadband, fast and ultrafast broadband and broadband prices
2	Human capital	25	Basic skills and internet use, advanced skills and development
3	Use of internet service	15	Citizens' use of content, communication and online transactions
4	Integration of digital technology	22	Business digitization and e-commerce
5	Digital public services	15	eGovernment and eHealth

Table 1: The main categories of the DESI index

From the point of view of the score obtained, the index allows the grouping of the member countries into three categories (clusters) (Table 2):

Cluster	Performance	Country
1	High	Denmark, Sweden, Finland, the Netherlands, Luxembourg, Ireland, the UK, Belgium and Estonia
2	Medium	Spain, Austria, Malta, Lithuania, Germany, Slovenia, Portugal, the Czech Republic, France and Latvia
3	Low	Slovakia, Cyprus, Croatia, Hungary, Poland, Italy, Bulgaria, Greece and Romania

Table 2: DESI index clusters in terms of performance

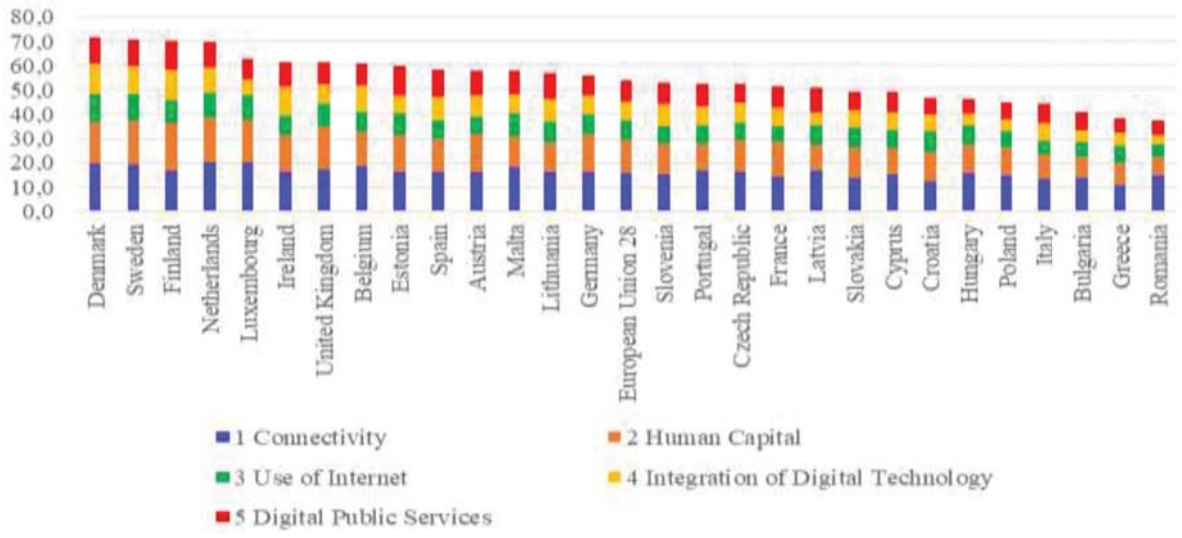

Figure 1: Digital Economy and Society Index [2]

Globally, the index shows that the progress made by the EU are insufficient to allow Europe to

catch up with the world leaders. It is imperative that the digital single market is rapidly completed and that investment in the economy and digital society will increase. Of the five categories, research has focused on participation and integration of enterprises in the development of digital economy and society. Paper presents the results of research on 12 digital technologies included in DESI for Romanian companies.

2.1 The use of ICT specialists. The digital competencies of the Romanian labor force are among the lowest in the EU. The research results show that among all the identified causes, the lack of basic digital skills has the greatest impact on the Romanian enterprises results. Thus, in 2016, only one third of the workforce had basic or above basic skills, while at EU level that proportion was two-thirds. Moreover, from the total population only 28% of Romanians have basic digital literacy skills or above the basic level, while in the EU this proportion amounts to 56% [3]. Despite the existence of a large number of qualified ICT specialists, comparable to the European average, workers in the labor market generally lack digital skills, which negatively influences labor market participation. As far as ITC specialists are concerned, Romania has made little progress, with only 2% of employees being classified as ICT specialists. The growing number of IT vacancies could increase the number of ICT specialists in the future. However, this situation may be affected by recent changes in wage taxation that may affect tax exemptions for ICT specialists starting with February 2018 [5]. In Figure 2 are represented percentage of enterprises without financial sector (10 persons employed or more) that employ ICT specialists. The comparative analysis highlights the existing gap and the tendency to decrease the percentage of IT specialists in Romania, generated by their migration to developed countries.

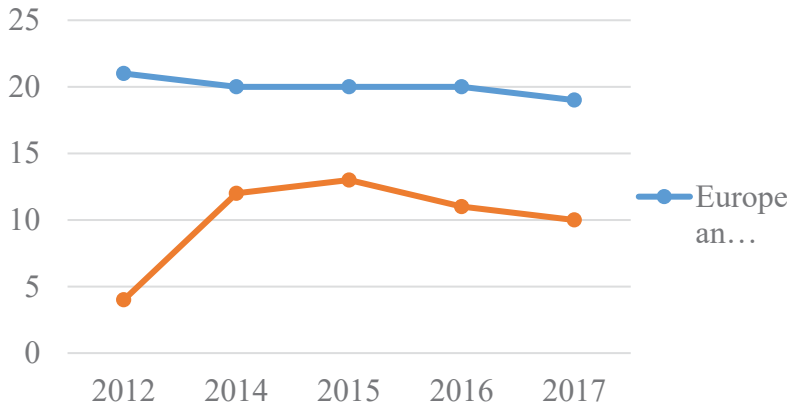

Figure 2: Enterprises without financial sector (10 persons employed or more) that employ ICT specialists (%) [6]

2.2 High-speed broadband connections (30 Mbps or more). Romania is below the EU average and has average progress. The coverage level of households by fixed broadband is still among the last (26th) countries in the EU (89% of households are covered, compared to the EU average of 97%). However, the level of coverage of households through the Next Generation Access (NGA) network at speeds above 30 Mbps is 72%, similar to the EU average. In terms of usage, the number of broadband subscriptions is among the highest in the EU (63% of fixed broadband subscriptions have a speed above 30 Mbps, compared to only 30% in the EU) [2].

Regarding the use of fixed broadband subscriptions, despite the progress made, Romania is among the weakest in the EU. The reasons for low degree of use could be the low levels of population digital competences and the price of subscriptions to broadband networks, which, although low in absolute terms, is one of the highest in the EU, relative to the income of a

Romanian citizen. Another reason could be the low level of development of digital public services. Therefore, access to Information and Communication Technologies (ICT) services remains uneven, with great disparities, especially in rural areas. Also, the use of mobile broadband is below the EU average (59 vs. 75 subscribers/100 people). National investment efforts in broadband networks continue in line with the "National Digital Agenda for Romania 2020" Strategy, which sets the following targets for 2020: fixed broadband coverage for 100% of households, coverage through broadband infrastructure with speeds above 30 Mbps for 80% of households and Internet connection via subscriptions with speeds above 100 Mbps for 45% of households [7],[8].

2.3 Mobile Internet access devices for at least 20% of employees. Broadband networks are underdeveloped in rural areas, leading to the risk of digital exclusion. Romania is one of the first countries in terms of internet speed. However, there are still rural areas that do not have access to the internet. Among the barriers that endanger the successful completion of broadband projects are: low implementation capacity, difficult administrative procedures for obtaining broadband deployment licenses and bureaucratic procedures for site commissioning. In order to eliminate the digital divide between urban and rural areas and ensure a viable connection rate, broadband investment could be complemented by demand-side measures. In 2017, only 43% of Romanian companies put their employees in portable devices with internet access (laptop, netbook or tablet, smartphone or smartwatch). Internet penetration rate increased slightly compared to 2016, showing that there are 4.6 million fixed broadband internet connections (+6% compared to 2016) and 16.6 million broadband mobile internet connections (+13% compared to 2016). Thus, the penetration rate of the fixed Internet per 100 households is approx. 55%, and mobile internet penetration per 100 inhabitants is 85% [9].

2.4 An internet site with complex functions. In general, businesses in Romania have a very simple website and a few computers, which explains the low level of digitization. Most sites do not have features like: website providing product catalogues or price lists, private policy statement, privacy seal or certification related to website safety, advertisement of open job positions or online job application, online ordering or reservation or booking, shopping cart, order tracking available online, electronic submission of complaints, at least one of the following: webacc, webctm, webot or webper (Figure 3).

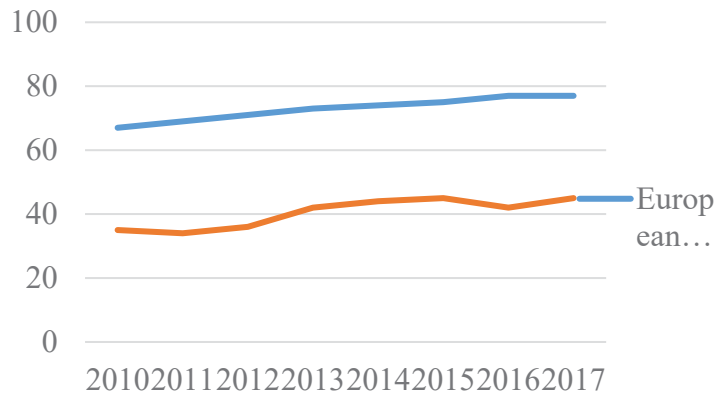

Figure 3: Enterprises having a website without financial sector (10 persons employed or more) (%)

2.5 The presence on social networks. Internet access for at least 50% of employees. The impact of social networks on the business environment has grown recent years, and marketing specialists are aware of the importance of the presence of any business on social networks.

Efforts of a successful social media strategy materialize after some time in an online active community on some of the social networks. The main benefits of social networking are: better targeting of the target audience, influencing the ranking of search engines, supporting site traffic, building a brand image, maintaining a permanent contact with customers, encouraging brand storytelling and "behind the scenes" images [10]. At European level, 63% of people entering the Internet do so for social networks, Romanians being, from this point of view, significantly above the average and on the ninth place in the European Union [11]. Among the favorite activities of Romanians entering the Internet are conversations through Whatsapp Voice Call applications. At the opposite end, banking services and online documentation are the least used: only 8% of Romanians use internet banking, at a European average of nearly 60%. Romanians also use the sharing and e-mail services (e-mail), online documentation (other information than press releases) or tourist bookings, according to the study. (Figure 4). All the ways of Internet access were taken into account in the research: via a fixed telephone line, from a router (or ADSL modem) connected to the fixed telephone network, through a dedicated communication controller, via telephone networks cellular, mobile (GSM), cable TV or satellite network.

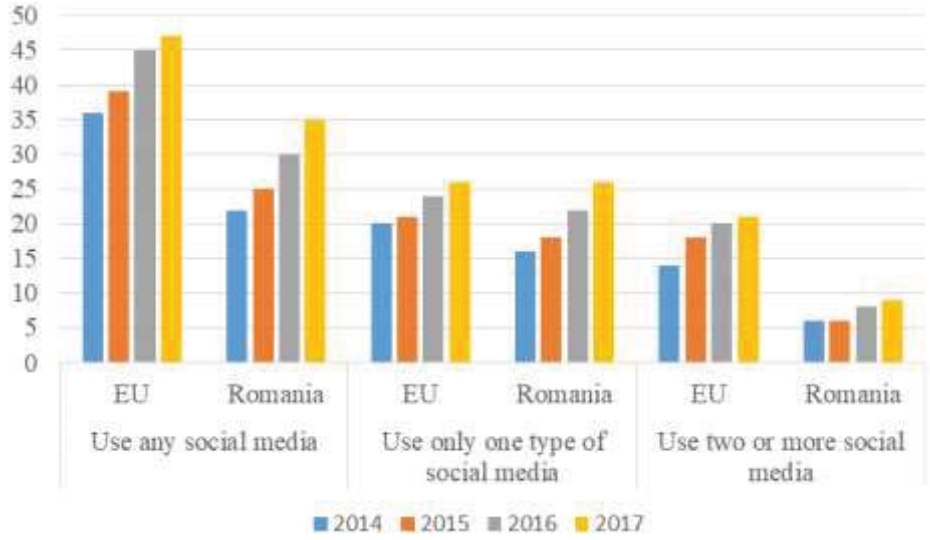

Figure 4: Social media use by type, internet advertising by enterprises without financial sector (10 persons employed or more) (%) [6]

2.6 Using an Enterprise Resource Planning (ERP) software package. ERP systems make a new step in their development by using the Internet to make functionalities more efficient. Customers located thousands of miles away can access the orders status placed or the company's inventory, by integrating ERP facilities with WEB applications. ERP systems are modular programs, each area of activity being covered by a specific application. Modules of an ERP system work together using a common database or can operate independently. The main modules that serve to manage an enterprise effectively are: planning and tracking production, stock records, suppliers, payments and receipts, salary calculations and personnel management, financial bookkeeping, fixed asset accounting and amortization calculations, management customer relations, reporting, analysis, and forecasting.

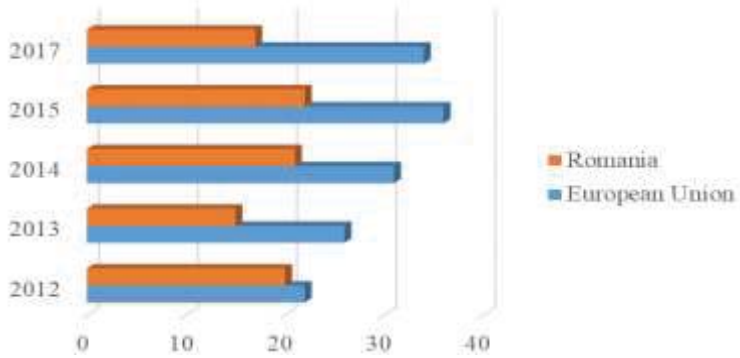

Figure 5: Enterprises who have ERP software package to share information between different functional areas (10 persons employed or more) (%)

In Romania, a small percentage of large or medium-sized enterprises use such applications due to the high cost and need of specialized staff. The comparative analysis highlights the existing gap between Romania and European average (Figure 5) [6].

2.7 Use of Customer Relationship Manager Applications (CRM). The customer relationship management system includes all types of interaction between a company and its customers, such as sales or complementary services. The purpose of a CRM application is to unify a company's interactions, with its customers and capitalize on the information they hold about them. The system is perceived as a control center for all customer activities, with an easy-to-use interface that meets the company's needs and organizational structure [12]. The software presents numerous benefits to the company, including: increasing customer loyalty and increasing sales, improving the company's image, improving products/services by providing feedback from the customer, helping customize and configure campaigns marketing, maintaining existing clients and strengthening relationships with major customers.

2.8 Electronic exchange of Supply Chain Management (SCM) information. Supply chain management includes coordination and management of all activities involved in the supply chain, to achieve optimum performance. Nowadays, some analysts call these activities operations of the supply network operations, desiring to better reflect the increased degree of collaboration among the actors involved in the process. E-commerce for supply and distribution allows collaborating within the company and business partners by providing information on mobile channel management, collaborative supply and demand planning, event management in the procurement process, materials management and order delivery management.

2.9 A turnover for e-commerce representing more than 1% of total business turnover. The value of online shopping in Romania reached 2.8 billion euros in 2017, at least 40% more than in 2016 (when the total gross was of 1.8 to 2 billion euros). It is a huge leap that shows the increasing appetite of Romanians for online shopping and especially the potential for accelerated growth of e-commerce. More Romanian online stores have grasped the trend and optimized their websites for mobile devices, but poor optimization of the mobile theme that generates higher loading times remains the main challenge of most online stores. The main factors in making the buying decision are, in order: the lowest price, brand reputation, delivery time as short as possible, the clarity and quality of the information, site usability and policy of the online store. An online buyer made an average of 8.7 purchases over the past year up from 2016, when the average was 8.4 acquisitions, but also from 2015, when the figure was 8.2 acquisitions per year. Figure 5 shows web sales of the enterprises where these are more than 1% of total turnover [6].

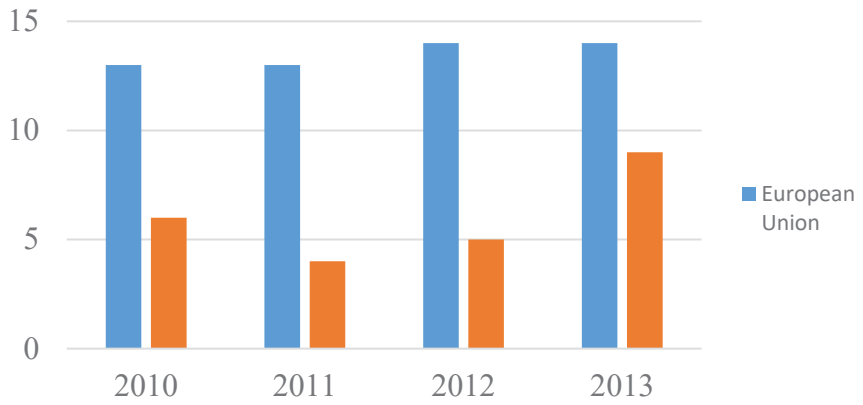

Figure 6: Web sales of the enterprises (10 persons employed or more) (%)

2.10 Internet sales between businesses and consumers of over 10% of total Internet sales. The number of online stores increased significantly from approx. 5000 stores in 2016 to over 7000 online stores in 2017. The trend of growth will continue in 2018 and the number of online merchants will double to around 14000. There are already about 25000 e-shops.ro that have an "add to cart" tool, so they can be considered as online stores – but their low traffic makes them insignificant in Romania. Thus, only 7000 stores are sufficiently relevant in terms of traffic and orders. The top categories of products sold online in 2017 (excluding e-tail) are, in decreasing volume order: electro-IT&C products, fashion&beauty products, home deco products, books and children's products. The main reasons of those who did not buy online are, in order: mistrust in the products displayed on the website, lack of possibility to see and test the products before purchase, mistrust in the quality of online shops and the obligation for payment of additional shipping charges.

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3. CONCLUSIONS

The low level of the digital business conditions, among other factors dynamics, reduced productivity. Taking into account these researched technologies, Romania is among the three EU member states, with the lowest proportion of enterprises, with a high degree of digital intensity.

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