

Artificial Intelligence – Opportunities and Challenges for Small and Medium Enterprises in Romania. A Case Study on the Exonia Group

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Abstract. *The economy of Romania is changing quickly, and small and medium-sized enterprises are at a stage where implementing artificial intelligence could make all the difference. Small and medium enterprises that do not have sufficient cash or specialised knowledge find this hard to apply, according to the literature. This paper tries to connect the dots by analyzing the relationship between small and medium enterprises and artificial intelligence in Romania through document analysis and a case study of Exonia, a group of Romanian companies that successfully implemented artificial intelligence in their businesses. The methodology also entails the analysis of graphs based on the digital economy and society index, exemplifying the latest information regarding the position of Romania in respect of small and medium-sized enterprises (and not only) that implemented artificial intelligence compared to the other countries in the European Union. Exonia's example shows how small and medium enterprises can make artificial intelligence an opportunity to obtain more efficient operations and happier customers. This paper was co-financed by The Bucharest University of Economic Studies during the PhD program.*

Keywords: artificial intelligence, small and medium enterprises, Romania, Exonia, innovation.

Introduction

Nowadays, artificial intelligence has become a crucial way to encourage new ideas and generate profit because it promotes continuous development and competitiveness. This paper details how important artificial intelligence has become for small and medium enterprises in Romania.

Previous literature studied larger companies, but this paper is important for the field of study because it focuses on small and medium enterprises, which, despite having the potential to change by using artificial intelligence (AI), have not been analyzed as much, especially in respect of Romania. This paper's goal is to analyze how small and medium enterprises (SMEs) can make artificial intelligence an opportunity to obtain more efficient operations and happier customers. Moreover, the literature review highlights the general issues these businesses may encounter when trying to implement AI (such as limited resources, a lack of specialised learning, and issues working in a team) and proposes solutions.

A qualitative research methodology (document analysis, case study) is used in this paper to paint a picture of the artificial intelligence scene for SMEs in Romania. Moreover, graphs based on the digital economy and society index, illustrating the latest information regarding the position of Romania in respect of small and medium-sized enterprises (and not only) that implemented artificial intelligence compared to the other countries in the European Union, are analyzed.

Exonia's example shows how SMEs can use artificial intelligence to optimize their processes, make customers happier, and generate new ideas.

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Literature review

This literature review aims to offer an overview of the already published works regarding digitalization for SMEs, together with the opportunities and challenges they might encounter.

First, it is important to understand the terms and ideas that are used in the area of small and medium enterprises digitalization using artificial intelligence.

Digitalization means the process of using digital tools in different aspects of a business, like customer service, marketing, and operations.

Artificial intelligence refers to the intellectual capability that computer systems or machines are programmed to feel and reason like human beings.

SMEs represent more than 90% of businesses, thus contributing substantially to worldwide production and employment. These autonomous entities, usually overseen by their owners, have difficulties as a result of diminished demand, restricted financing availability, and decreased orders (Martínez-Peláez et al., 2023).

In Romania, SMEs meet the standard criteria given by the European Union (EU). The Romanian Tax Code also sets out specific criteria in Article 47, but for the purpose of simplifying the explanations, only the general EU standards will be detailed in the following.

According to EU standards, SMEs are categorized based on their staff headcount, annual turnover, or balance sheet total. Micro-enterprises are businesses with fewer than 10 employees and an annual turnover or balance sheet total not exceeding €2 million. Small enterprises are businesses with fewer than 50 employees and an annual turnover or balance sheet total not exceeding €10 million. A medium-sized business has 250 or fewer employees, its annual turnover does not exceed €50 million, or its annual balance sheet total does not exceed €43 million (European Commission, n.d.).

Romanian SMEs have a great impact and contribute, most importantly, to national employment, innovation, and fostering economic growth. The Romanian government and the European Union offer various support programs aiming to foster the development and competitiveness of SMEs in the country. SMEs often have trouble accepting digital technologies because they do not have enough money, knowledge, or confidence regarding potential risks.

Research has shown that going digital could be good for small and medium-sized businesses (European Investment Bank, 2023). Some benefits are: getting more work done, having more engaged customers, making better decisions through data analytics, lowering costs by automating processes, and having the chance to generate new business opportunities. SMEs can also change with the times by going digital, which can make them more competitive.

Despite the possible benefits, many small and medium-sized businesses have trouble going digital. These issues include information and awareness, financial resources, and technical skills.

Regarding information and awareness, many SMEs are not aware of the benefits of going digital. They might also not have the skills to use digital technologies. People often do not know about digitalization or are not aware of it because they do not have enough resources, cannot get training or help, or think it is too hard or dangerous (Banerjee, 2023). Moreover, a study revealed deficiencies in the utilization of strategic management tools and resources among small enterprises in Romania (Moraru & Popa, 2018).

The European Investment Advisory Hub and Oliver Wyman conducted a study that found the main things that were stopping Romanian SMEs from going digital. The study also gave suggestions on how to deal with these problems (European Investment Bank, 2023).

Some of the things that stand in the way are not knowing enough about the benefits of digitalization, not having enough digital skills and abilities, not having enough good digital

solutions available, having trouble getting money, and small businesses having to choose between different goals.

Examples of suggestions are: to create a government strategy which would make it easier for SMEs to interact with the government online; to set up a platform for various information; to run campaigns that would make SMEs more aware of the issue, thus making digital innovation hubs stronger and easing their access to proper training; to work with banks and fintechs to improve SME's interactions with the financial sector.

Other suggestions include adapting the already-existing programs to the needs and digital level of SMEs, which will drive the growth of tech companies that offer affordable digitalization products.

For the innovation ecosystem to keep growing, the potential solutions include using the single-source platform to help match markets across the country, helping tech companies grow by giving them more money, and holding competitions or hackathons to find specific digital solutions.

They are meant to help Romanian SMEs be able to become more digital, in general, through the skills, information, and money they need to move more of their activity online and raise their output and competitiveness.

SMEs need to strategize in tailor mode so that they can effectively tackle the peculiar challenges of the business environment and exploit the potential opportunities available. The strategies that the firms should adapt in order to enhance their competitiveness and ability to recover from setbacks may include digitalization, investment in skills improvement among the firms' employees, and strategic alliances.

Rădulescu and Rădulescu (2021) describe how education and business training can help Romanian small businesses grow and be successful. In their article called "Case study concerning successful Romanian SMEs development by students education and entrepreneurial training", they stress how important it is to get more small businesses to use digital tools and sustainable business practices. This plan's aim is to make Europe the best environment for SMEs to be created and grow, which, in time, would help create a flexible digital economy that utilizes resources efficiently.

SMEs, on the other hand, need good management to do well, and education and training in entrepreneurship are very important for building up business knowledge and skills (Avornicului et al., 2023).

In 2018, in Romania, there were only 29 SMEs for every 1,000 people living in the country, while the average in Europe was 58 SMEs for every 1,000 people. Also, only 10% of Romanian SMEs are involved in new activities, which shows how much needs to be fixed (Rădulescu & Rădulescu, 2021).

The Romanian government has set up programs like Start-Up Nation and SME INVEST ROMANIA to help small businesses get started and give them access to money. Despite this, the volatility of the job market and inflation are factors that negatively influence the ability of SMEs to grow and stay stable.

The school system is very important for getting people ready to work for small businesses and making them better. Focusing on digital education as a strategic axis by the Romanian government is meant to speed up technology and help bring about changes in society and the economy.

According to the European Economic and Social Committee (2021), AI is being used in more and more areas, and big companies are usually the ones who do it first. Only 21% of micro- and 22% of small businesses in the EU use two or more AI technologies. Big businesses, on the other hand, use 39% of these technologies. Because large firms have more resources and skills,

these generate high profits, and thus the big companies are more likely to benefit from apps based on AI and smart gadgets.

Small and medium-sized businesses find it hard to accept and use AI solutions, even though AI could be useful. This is because many managers of SMEs are not well acquainted with how AI can be used.

Connected to this is the fact that most SMEs lack employees who are skilled enough in AI, perhaps because it is expensive to find skilled AI professionals, and many of them would rather work for start-ups. Companies that are not as developed as big businesses also have trouble hiring and keeping AI experts because the salaries they offer are not competitive.

Aside from not having enough skilled workers, SMEs also cannot afford to use AI technologies. Changing how operations work and making unique AI solutions are all part of this cost. Another reason why SMEs do not use AI very often in their operations is because they cannot or find it difficult to quantify the benefits of using AI compared to the costs it would incur.

In addition to this, SMEs find it harder to access data sources outside of their own. Data must be reliable and easy to find for AI to work well.

Making tools and solutions with AI that are just right for SMEs is an important goal. SMEs can use these tools and solutions to mitigate risks, solve problems, and thus become more productive through the employment of AI. For example, SMEs can use AI-powered chatbots on their websites to help website users right away and provide better customer service. Many customers ask the chatbots various questions and receive related product suggestions. Moreover, some of these chatbots can even help place orders. Besides the evident benefit of making customers happier, this also means more free time for workers to concentrate on tasks that are more difficult and that need human input. Another good use of AI is utilizing it to manage the supply chain. AI could help keep better track of supplies, thus saving money and helping SMEs run smoother.

AI can also help SMEs in respect of advertising. AI algorithms can quickly analyze data about customers and trends in their actions to make marketing more personalized for certain groups of people. Because of this, SMEs may be able to get more customers to buy, keep those customers longer, and get a better return on the marketing they do. SMEs can also use AI to help them manage their money and figure out how risky something is. AI can look at one's financial data, find strange things, and give information that will help one handle one's money better, meaning that firms of all sizes can use it to identify and mitigate risks and better manage their finances.

Methodology

For the purpose of this paper, the qualitative methods of document analysis and case study are used. Moreover, graphs based on the digital economy and society index in respect of small and medium-sized enterprises (and not only) that implemented artificial intelligence are analyzed in order to draw conclusions on how Romania is currently positioned compared to the other countries in the European Union.

A variety of articles and reports are examined as support for the literature review and for the results and discussion section. Moreover, the Romanian Exonia group was chosen as the key focus for the case study because it contains both small and medium enterprises and thus provides a good overview of what benefits the implementation of artificial intelligence can bring to SMEs.

Results and discussions

The AI market on a global scale is divided into various segments based on its components (hardware, software, and services), deployment methods (cloud and on-premise), applications (virtual assistants and chatbots, predictions and modeling, text analytics, speech analytics, computer vision, predictive maintenance, and others), and end-user industries (NMSC, 2023).

According to Grand View Research (2023), the global artificial intelligence market had an estimated value of USD 196,63 billion in 2023, and its size is projected to expand at a compound annual growth rate (CAGR) of 37.3% until 2030.

In 2022, AI startups globally received large investment, surpassing USD 93.5 billion in funding, marking a notable rise compared to previous years (CB Insights, 2022). This investment increase could be attributed to the increasing trust that investors and venture capitalists have in the potential of AI.

The increasing trust in AI is not solely restricted to startups and significant financial commitments; it is also evident in the wider business environment, encompassing SMEs. Despite this, integrating new technologies, such as AI, into SMEs usually encounters certain difficulties.

According to statistics from Eurobarometer 486 (Ogrean and Herciu, 2021), 62% of SMEs in the EU report having at least one barrier to digitization. In Romania, however, just 53% of SMEs confess they are facing challenges associated with digitalization.

Romanian SMEs have invoked a lack of financial resources (30%) and legal difficulties (20%) when being asked about the obstacles they encounter with respect to digitalization.

A lack of skills affects 8% of Romanian SMEs, while a lack of information technology infrastructure affects 8%, internal opposition to change affects 8%, uncertainty about future digital standards affects 5%, and IT security risks affect 5%.

A greater part of SMEs in the EU compared to those in Romania believe that internal refusal to change, a lack of information technology infrastructure, and a shortage of skills are hurdles to digitalization.

Compared to the average of the European Union (4%), 8% of Romanian SMEs have stated that they have no interest in digitization.

76% of SMEs in the EU have recognized the need to integrate digital technology into their operations or have even begun the process of doing so. Romania is far from this, with only 48% of SMEs having done this.

The findings explain the disparities between SMEs in Romania and those in the EU27 in terms of their attitude, trust, and behavior in relation to digitalization.

Another very important indicator that has the purpose of monitoring Europe's overall digital performance and tracking the progress of countries in the European Union regarding their digital competitiveness is the digital economy and society index (DESI).

According to the European Commission (2023), based on the DESI (data from 2022), Romania is positioned quite low regarding SMEs with at least a basic level of digital intensity, compared to the mean of the European Union, as can be observed in Figure 1.

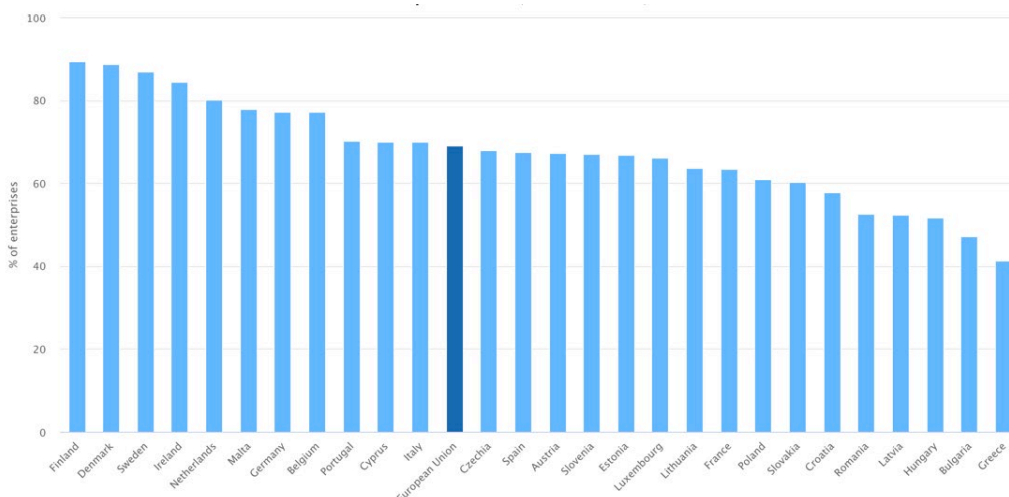


Figure 1. SMEs with at least a basic level of digital intensity, SMEs (10–249 employees), without financial sector; DESI period: 2023 (data from 2022)

Source: European Commission (2023).

Compared to the previous year (2021), the position of Romania has improved, as can be observed in Figure 2 (*idem*), as in 2022 Romania surpassed Greece, Bulgaria, Hungary, and Latvia. In 2021, Romania had the fewest SMEs with at least a basic level of digital intensity from the European Union.

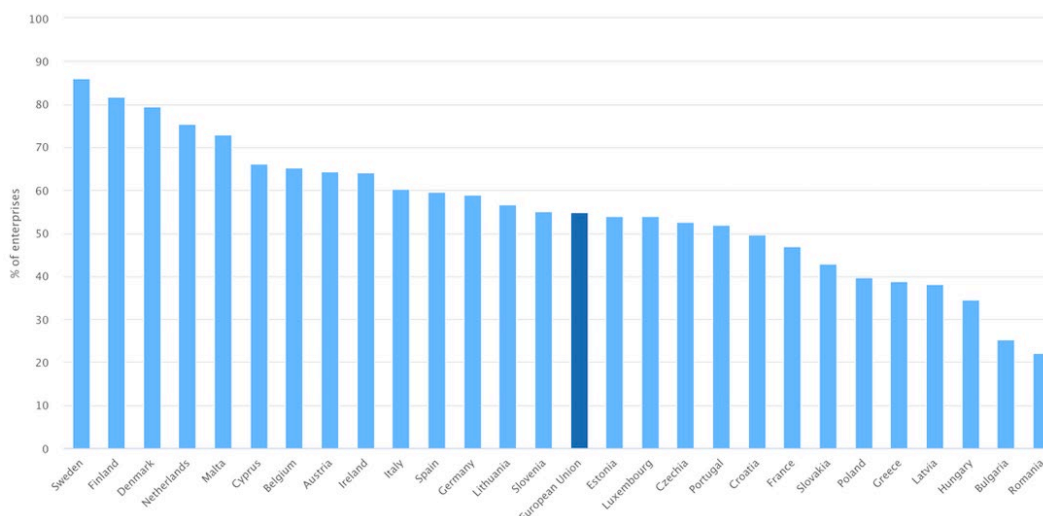


Figure 2. SMEs with at least a basic level of digital intensity, SMEs (10–249 employees), without financial sector; DESI period: 2022 (data from 2021)

Source: European Commission (2023).

From Figure 3 (*idem*), one can observe that, in respect of AI used in all enterprises, Romania is still much behind the mean of the European Union, occupying the last place in the graph. This could be justified by the lack of trust that Romanian enterprises still have in artificial intelligence.

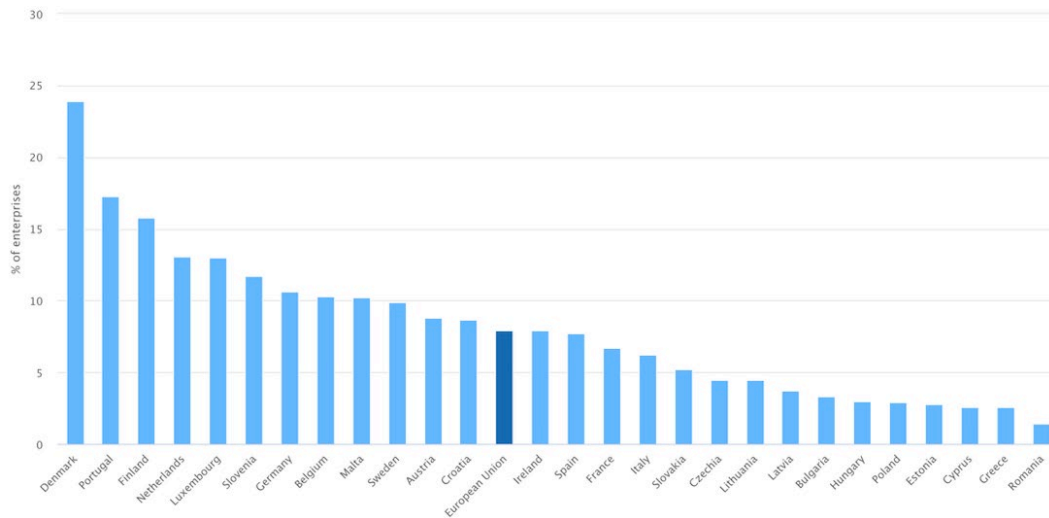


Figure 3. Artificial intelligence, all enterprises, without financial sector (10 employees or more); DESI period: 2023 (data from 2021)

Source: European Commission (2023).

Despite this, some firms hope that actively integrating AI into their operations will eventually lead to a more successful business.

One good example is the Exonia Group, a very important player in the packaging industry in Romania. Tiberiu Stoian, an entrepreneur who has investments in the packaging industry, information technology, tourism, and commerce in Romania and the United States, initiated the formation of the Exonia Iasi company in the 2000s.

The three companies that make up the Exonia group are named Exonia Holding, which manufactures paper packaging; Exonia Production, which manufactures plastic packaging; and Artis Design, which is an integrator for industrial digitalization solutions.

It is estimated that Exonia Holding is worth more than 25 million euros. The company, headquartered in Iași, has made investments totaling more than ten million euros (Actmedia, 2023).

As of November 2023, all companies that are members of the Exonia group are classified as SMEs in Romania.

The Exonia Group is the first in Romania to implement AI ChatGPT technology in its design department. This success is due to the positioning of Exonia Group on the market as one of the leading key players in the packaging industry in Romania. Such implementation opens the door for new opportunities and strengthens Exonia as one of the most pioneering leaders in the development of their innovative packaging technologies.

With this new technology in packaging design, ChatGPT will be a game-changer in performance and efficiency. Exonia is in a position to push the barriers of possibility in the application of this top-of-the-range technology, thus enabling the company to be able to offer customers individual and creative packaging solutions.

The ChatGPT artificial intelligence technology is revolutionary because it makes it possible for Exonia designers to work together with an intelligent artificial language model that comprehends natural language and generates text and graphics in that language. The AI system reads the designer's natural language requirements and specifications for complicated packaging design, and it then quickly responds with innovative recommendations and suggestions. Designers are able to articulate their requirements and specifications using natural language. This hastens the design process, making it more productive and accurate to guarantee quality outputs.

The application of AI ChatGPT technology has contributed to a lot of positive results for Exonia, and this is felt not only in the company but is appreciated by clients. This way, the business can respond with individual packaging options at a faster rate, hence the efficiency and reduction in costs of operation.

Customers also benefit from an improved experience since they are able to articulate their requirements and preferences in a manner that is both clear and succinct, and the designers at Exonia are able to swiftly transform these into package concepts that are tailored to the specific demands of each customer.

According to Mr. Tiberiu Stoian, the creator of Exonia, "technological evolution is essential in order to remain competitive in a market that is changing. Implementation of AI ChatGPT technology in Exonia would be a step towards innovation and efficiency in packaging design. We are proud to be pioneers in the Romanian packaging industry, and we firmly believe that this technology will bring significant benefits to the company and our customers." (IQads, 2023).

This case study supports the past literature findings that were associated with the possible benefits that are anticipated to be brought about by the implementation of artificial intelligence. Moreover, the conclusions derived from the analyzed graphs well represent the underlying challenges Romanian small and medium enterprises are still facing in relation to the use and deployment of artificial intelligence in their business models.

Conclusion

Implementing artificial intelligence in SMEs opens a world full of opportunities but also of issues. This paper emphasizes the pivotal role that artificial intelligence has in the development of SMEs, helping them become more efficient and creative, especially in the Romanian economy.

SMEs are very important in Romania because they create new jobs, are somewhat open to innovation, and boost growth. The three main issues that hinder the implementation of AI in SMEs are: the benefits of digitalization are not fully understood; not enough money is available; and employees and even managers do not have enough technical skills.

As shown above, implementing AI in SMEs could bring about optimized operations, happier customers, and new opportunities on the market.

Although this paper focuses on Romanian SMEs, it may limit the generalization of the findings to other countries, as various cultural, economic, and regulatory aspects can influence the adoption of AI in SMEs significantly.

The results highlighted in this paper are according to the ones in the previous literature related to SMEs in Romania and AI and support the idea that, although implementing AI in SMEs is surely not easy, it is definitely worth the effort for the benefit of SMEs.

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