THE ROLE OF ERP AND RPA WITHIN COMPANIES IN THE CONTEXT OF INDUSTRY 4.0: BENEFITS GENERATED AND MAIN VENDORS

Andreea Măldăreanu
PhD Student
The Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems, Bucharest, Romania

Andreea Gabriela Tănase
PhD Student
The Bucharest University of Economic Studies
Faculty of Management
Bucharest, Romania

Grigorescu (Stănescu) Andreea,
Ph.D. Student, Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute of National Economy, Bucharest, Romania

Răpan Ivona,
Associate Professor PhD habil, SR IInd, Institute of National Economy, Romanian Academy

Professor Raluca-Florentina Crețu, Ph. D., habil.,
The Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems, Financial and Economic Analysis Department, Bucharest, Romania

Lecturer Viorel-Costin Banța, Ph.D., habil,
The Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems, Management Information Systems Department, Bucharest, Romania

Abstract: : The development of digitalization technologies has led to increased interest from companies in implementing modern solutions that facilitate processes. By analyzing the specialized literature in the field, we identified ways in which ERP systems, Cloud ERP, and RPA-based solutions can be used, both separately and together, and we also identified

the main vendors available on the market. The studies analysed were extracted from the Web of Science and Scopus databases, or searched via Google Scholar, but documentation provided by vendors and analyses published by the Gartner platform were also taken into account. The benefits generated by the use of these solutions within companies have been identified, such as reduced costs and working times, simplified workflows, and increased efficiency in task completion. The current research, which focuses on conceptual aspects, can be expanded by adding practical examples.

JEL classification: M15, M21, O33

Key words: ERP – Enterprise Resource Planning; RPA – Robotic Process Automation; Cloud ERP; process automation; ERP vendors; RPA vendors.

1. INTRODUCTION

Currently, modern digital technologies are becoming increasingly attractive to companies that want to boost their results and become as widely known as possible. Traditional Enterprise Resource Planning (ERP) systems have been used by companies to integrate processes into a single platform for some time now (Hendricks et al., 2007). Therefore, companies have begun to focus on more innovative technologies based on cloud computing, automation, and artificial intelligence, such as Cloud ERP and Robotic Process Automation (RPA) technologies. As will be presented in the current study, by using ERP integrated with RPA, or Cloud ERP solutions, processes can be streamlined, operational costs reduced, and data compliance and accuracy improved. The purpose of the study is to highlight the role of using ERP, Cloud ERP, and RPA solutions, together and separately, within companies, emphasizing the benefits and presenting the most well-known vendors of these technologies.

The paper is structured as an analysis of the specialized literature in the field, extracting academic articles on the implementation and use of these solutions, but also taking into account information published by vendors and the Gartner platform. Next is the section specific to the literature review, followed by the presentation of the methodology. Finally, the discussions and conclusions of the study are mentioned.

2. LITERATURE REVIEW

Since their inception, ERP systems have been widely used by companies to easily perform various activities, such as managing orders, financial operations, and forecasting (Hendricks et al., 2007). Because information from across the organization is found on a single platform, real-time access to data from all departments is facilitated (Hendricks et al., 2007, Rajan and Baral, 2015). Over time, ERP systems have been constantly developed and improved, with the Cloud ERP version now becoming increasingly popular (Seethamraju, 2015). The main advantage of cloud-based ERP systems is their significantly lower cost of use (Seethamraju, 2015).

Also, in Industry 4.0, another trend that is constantly developing is the use of solutions based on RPA technologies (Ribeiro et al., 2021). For the automation of business processes, innovative RPA tools can be used (Syed et al., 2020). Software robots can be built that have the ability to automatically perform tasks that would

normally be performed by a user (Syed et al., 2020). This solution is particularly suitable for pocesses that are repetitive, numerous, and require a long execution time (Syed et al., 2020). RPA-based solutions can be easy to use and configure, and integrating them into company processes leads to a significant increase in efficiency, improved regulatory compliance, and the delivery of higher quality services (Syed et al., 2020). It has also been demonstrated that the use of software robots can lead to a reduction in operating costs of up to 50% (Ribeiro et al., 2021).

3. METHODOLOGY

This study aims to show how digital technologies, such as ERP and RPA solutions, can be used to optimize business processes within companies and to present the main vendors of these solutions. A narrative review of the literature on the use of ERP and RPA solutions at the company level was conducted in the context of Industry 4.0. This type of literature review is not characterized by the rigor of the selection process of the analyzed papers (Paré et al., 2015).

The content of academic articles extracted from the Scopus and Web of Science databases, as well as those taken from Google Scholar, was analyzed, taking into account the papers that were considered relevant to the researched topic. The study mentions articles dating back to 2006, as traditional ERP systems have been the subject of specialized studies since 1960, while articles discussing automation based on software robots are more recent, with most being published since 2020.

The documentation provided by ERP and RPA technology vendors and information published online by the Gartner platform were also researched. The Gartner platform features market reports, user reviews of digital solutions, and predictions on emerging trends in various fields (Gartner, 2025).

4. DISCUSSIONS

4.1 Implementation and use of ERP and Cloud ERP systems

The implementation of ERP systems can be considered a complex process, requiring considerable initial investment, with successful implementation being influenced by various factors (Rajan and Baral, 2015). Some of these factors may be the composition of the project team, the project manager, management support and involvement, and the most appropriate organization (Soja, 2006). Furthermore, implementing an ERP system can lead to changes in how business processes have been carried out up to that point (Rajan and Baral, 2015). The implementation process can consist of three stages: pre-implementation, at which detailed planning is carried out, implementation, which involves the actual implementation of the ERP system, applying different models and strategies, and post-implementation, which consists of careful monitoring of the system's capabilities over a longer period of time (Ali and Miller, 2017).

According to the study conducted by Mahmood et al. (2020), which analyzes the literature on issues and challenges associated with the use of ERP systems, the key factors identified are closely related to project management, including: project team composition, implementation costs, and project organization and execution. In addition, employee resistance to change is an important issue that must be managed carefully in order for ERP implementation to be successful (Mahmood et al., 2020).

Cloud ERP, designed as Software as a Service (SaaS), provides users with services they can access via the internet (Seethamraju, 2015). Cloud ERP through innovation and automation can lead to process optimization and increased performance (Seethamraju, 2015). Company employees can also use the results obtained by the newly implemented solution to reach more complex conclusions, without having to waste time on simple tasks that can be easily and quickly performed by new technologies (Seethamraju, 2015). According to analyses conducted by Gupta et al. (2020), hypotheses stating that Cloud ERP solutions have a positive impact on organizational performance, both economic and social, as well as environmental, are supported.

4.2 Use of RPA technologies and integration with ERP

RPA technologies can be integrated into companies that already use other digitalization solutions, as they mostly operate at the front-end level (Hofmann et al., 2020). Software robots generated based on RPA technologies can perform various types of activities, some of which include opening and closing applications, filling in the text boxes in forms, connecting to various platforms, and checking emails (Ribeiro et al., 2021). In addition, there must be good communication and cooperation within the company between IT staff and those who manage business aspects (Hofmann et al., 2020).

Software robots can be used within an ERP system, both traditional and cloud-based, to automate processes (Stoykova et al., 2022). One of the most well-known ERP system vendors worldwide is SAP (Stoykova et al., 2022). Furthermore, SAP has made available to users a platform that includes many new features, the Business Technology Platform (BTP), which incorporates iRPA, artificial intelligence, and machine learning technologies (Stoykova et al., 2022).

4.3 ERP and RPA vendors

According to the Magic Quadrant provided by Gartner platform, SAP Cloud ERP is listed among the leaders in Cloud ERP solutions in 2025, alongside Microsoft, Oracle (NetSuite), Oracle (Fusion Cloud ERP), IFS, Infor, Epicor (SAP, 2025). In the studies conducted by Elbahri et al. (2019) and Dumitru et al. (2023), the solutions offered by SAP, Oracle, and Microsoft were also analyzed. All technologies provided by these vendors generate a multitude of benefits within companies, encouraging the adoption of modern automation tools.

According to Dumitru et al. (2023), SAP offers solutions that generate long-term benefits, with strategies based on sustainability, Oracle adapts more to changes in the business environment, and Microsoft has focused more on automation, even integrations with the tools offered by Automation Anywhere. For large companies, the solutions provided by SAP are more suitable, as the implementation costs are relatively high (Elbahri et al., 2019).

For RPA solutions, UiPath, Automation Anywhere, Microsoft, and Blue Prism are ranked as market leaders for 2025 (UiPath, 2025). Similarly, in the study conducted by Syed et al. (2020), the top three market leaders identified were Blue Prism, UiPath, and Automation Anywhere. Another study mentioned that both UiPath and Automation Anywhere can easily integrate the tools they offer with ERP systems (Ribeiro et al., 2021).

Since 2019, UiPath and Automation Anywhere have been providing users with technologies based on software robots for automation, constantly improving their products and services to date (Dumitru et al., 2023). The study conducted by Dumitru et al. (2023) also mentions that these solutions offer direct interaction with ERP systems, such as SAP. Compared to UiPath and Automation Anywhere, Blue Prism is not as transparent when it comes to providing information about product development (Dumitru et al., 2023). It has been demonstrated that users have resorted to the help offered by one of these three solutions for process innovation, increased efficiency, and improved results (Dumitru et al., 2023).

5. CONCLUSIONS

By conducting a narrative review of the literature in the field, it was found that the use of digital technologies such as ERP systems, Cloud ERP and RPA solutions can lead to significant improvements in processes across different departments within companies. Some of the benefits commonly associated with the integration of such technologies are reduced operation execution time, easy access to data, and fewer errors. These advantages can be extended by integrating ERP systems with RPA solutions.

The current study also mentions the main vendors of ERP systems, namely SAP, Oracle, and Microsoft, as well as RPA technologies, namely UiPath, Automation Anywhere, and Blue Prism. One limitation of the study may be considered the theoretical perspective adopted. The research may represent a starting point for a more detailed analysis of the various solutions available on the market or for a more complex study focusing more on concrete practical examples.

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