INDUSTRY 5.0: DIGITALIZATION OF ACCOUNTING THROUGH THE EMERGENCE OF E-INVOICE

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Abstract

Industry 5.0 is defined by the connection between technology and human skills, enhancing the field of accounting through the integration of artificial intelligence (AI), automation, and advanced data analytics solutions. In this new industrial stage, the focus is not only on automation but also on supporting human activity through the personalization of processes and technology [14].

In this context, accounting professionals are challenged to expand their traditional roles, becoming involved in predictive analysis, strategic advisory, and risk assessment, supported by digital tools. A core element of Industry 5.0 in accounting is the use of AI to simplify complex operations. Through these technologies, financial data is processed quickly, enabling anomaly detection and improving the accuracy of reports[8].

For automating routine tasks, robots and software are used, such as account reconciliation, invoice management, and transaction auditing, freeing up human resources for higher-value activities. In this way, AI helps increase efficiency and reduce errors in accounting processes [10].

The collaboration between humans and machines, characteristic of Industry 5.0, opens new perspectives for accounting, supporting in-depth analysis and decision-making based on precise information. Accountants can use advanced digital platforms to assess risks, optimize cost structures, and anticipate market fluctuations, relying on data and advanced analytical models [6].

Keywords: *industry 5.0, technologies, accounting, machines, humans, errors*

Classification JEL: *G19, G32, F65, F36*

1. Introduction

Industry 5.0 brings a shift in global technological transformation, emphasizing the balance between humans and technology [13]. While Industry 4.0 focused on process automation and the use of artificial intelligence [3], Industry 5.0 aims to enhance the field of accounting, where technology does not replace people but rather assists them in increasing efficiency [16].

Accounting in the context of Industry 5.0 is characterized by personalization and adaptation to customer needs [12], thanks to the use of analytics and artificial intelligence technology [15]. A good example of this evolution is the implementation of E-Invoice, an efficient solution that helps manage accounting documents and facilitate communication between companies and tax authorities. E-Invoice supports reducing time and human errors that can arise from traditional

invoicing, while also ensuring increased transparency and precise traceability of financial documents.

In addition to E-Invoice, Industry 5.0 technologies allow accountants to focus on strategic activities and in-depth data analysis through benefits such as process automation and optimization [5]. This transformation enables the identification of financial trends, an estimation of potential economic difficulties, and a response to client demands.

With the development of technology, data security challenges also arise. As volumes of sensitive data increase, so do the risks associated with protecting accounting and financial information [11]. To avoid security issues, companies are required to adopt advanced cybersecurity measures and rigorous privacy policies. Implementing these solutions not only protects data but also contributes to client trust in modernized accounting processes.

In this article, we will analyze how accounting is transforming under the influence of Industry 5.0 [14], exploring the advantages of new technologies like E-Invoice and the challenges they bring to accounting processes and client relationships in both Romania and countries that have implemented E-Invoice.

2. Paper body

With the progress of automation and digital technologies [9], accounting processes are becoming increasingly sophisticated and adapted to the new era of Industry 5.0 [7]. E-Invoice represents an essential element of this transformation, serving as a digital invoicing management solution that allows companies and public institutions to streamline financial transactions and minimize human errors.

This case study aims to analyze how the E-Invoice system has been implemented in Romania and other countries [18], focusing on the benefits obtained, challenges encountered, and lessons that other countries in the process of digitizing accounting can learn.

In Romania, the E-Invoice system was implemented as part of a national digitalization program for fiscal services, aiming to increase transparency and reduce tax evasion, especially in the public procurement sector [19]. By using the E-Invoice service, the flow of transactions is monitored, and efficiency is enhanced in managing invoices for companies contracting with public authorities.

A significant challenge is the reluctance of small and medium-sized enterprises (SMEs) to fully use the digital system, mainly due to additional implementation costs and a lack of adequate infrastructure.

In Italy, this method was adopted in 2019 for B2B and B2C [17] transactions to combat tax evasion and increase VAT collection. Following its implementation, VAT revenues increased, and transparency in commercial transactions improved. Similar to Romania, SMEs faced cost-related issues and required additional training to adapt to the new regulations.

Spain adopted this system primarily for the public sector, focusing on government contracts and certain categories of commercial transactions [21]. The E-Invoice system improved the monitoring and tracking of fiscal documents, helping combat fraud and optimize tax collection. Furthermore, the shift from traditional to digital invoicing helped reduce the time required for processing and archiving documents.

The adaptation process for SMEs and accountants to complex technical and legal regulations required considerable time and resources, and many companies were reluctant toward the level of transparency imposed.

Germany primarily uses E-Invoice for government contracts, making it mandatory for suppliers working with the public sector. Increased administrative efficiency has been observed in the public domain, as well as effective tracking of allocated funds. Implementing E-Invoice has reduced fraud in the public sector [20]. However, Germany faces challenges related to the rigidity

of the legislative framework and the need to integrate E-Invoice with other accounting and auditing systems, which slows and raises the costs of the implementation process.

Analyzing this information about the target countries, we deduced:

Common Benefits:

Enhanced tracking and clarity of fiscal documents;

Automation of accounting processes to prevent human errors;

Maximization of administrative efficiency and prevention of tax evasion.

Similar Challenges:

Implementation costs and hesitation among SMEs to adopt new technologies;

Required training for accounting staff and adaptation to current regulations and technologies.

Differences:

Italy extended E-Invoice to B2B and B2C transactions, achieving positive results in VAT collection and reducing tax evasion.

Germany focuses on the public sector, implementing E-Invoice for government contracts but encountered more significant legislative obstacles.

Results: E-Invoice increased visibility and control over fiscal invoices through detailed electronic records, thus reducing fraud risk and improving transparency for state institutions. By accurately tracking transactions between suppliers and clients, the system optimized audit and fiscal verification processes.

This system has eliminated part of the manual processing, reducing errors and speeding up the issuance and processing time for invoices. Consequently, companies have achieved higher efficiency in managing fiscal documents.

Implementing E-Invoice has led to improved state revenue collection by quickly identifying discrepancies. A decrease in false or unregistered invoices has been observed, thus reducing tax evasion.

Among SMEs, difficulties persisted due to the initial implementation costs and the need for training for accounting staff, which slowed the system's adoption. The implementation of E-Invoice highlighted the need for additional training for accountants in using digital platforms and adapting to digital fiscal regulations.

3.Conclusions

Industry 5.0 brings new opportunities for accounting but also complex challenges related to data security and fiscal transparency [2]. The implementation of digital systems, such as E-Invoice, has already proven to enhance document traceability and reduce tax evasion.

However, widespread adoption requires significant investments and proper staff training, making it essential to support SMEs in adapting to new regulations and technologies. Strengthening these measures will contribute to greater efficiency and trust in accounting services, supporting the transition to a digitized and secure financial environment.

To support the implementation and adaptation to new accounting technologies in the context of Industry 5.0, we propose the following suggestions:

1. Offering courses that support the adoption of new accounting technologies.
2. Subsidies or tax deductions to help companies adopt advanced security technologies.
3. Collaboration to simplify regulations and assist small businesses in adapting to digitalization.
4. Informing companies about the importance of cybersecurity and fraud prevention.

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