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UTJECAJ REGULATORNOG OKRUŽENJA NA USVAJANJE INFORMACIJSKE TEHNOLOGIJE U MALIM I SREDNJIM PODUZEĆIMA: SUSTAVNI PREGLED LITERATURE

THE REGULATORY ENVIRONMENT INFLUENCE ON THE INFORMATION TECHNOLOGY ADOPTION IN SMALL AND MEDIUM-SIZED ENTERPRISES: A SYSTEMATIC LITERATURE REVIEW

SAŽETAK: Mala i srednja poduzeća postala su ključna okosnica gospodarstava diljem svijeta. Na današnjem turbulentnom tržištu, ostvarivanje i zadržavanje konkurentske prednosti malih i srednjih poduzeća uvelike ovisi o pravovremenom prepoznavanju i usvajanju informacijske tehnologije koja će poduprijeti svakodnevno poslovanje. Cilj je rada ispitati utjecaj regulatornog okruženja u procesu prihvata novih informacijskih tehnologija u sektoru malih i srednjih poduzeća. Shodno navedenom, u ovome radu proveden je sustavni pregled literature nad znanstvenim radovima iz odabranog područja, koji su objavljeni u međunarodno priznatim znanstvenim časopisima ili zbornicima međunarodno priznatih znanstvenih konferencija indeksiranim u bazi znanstvenih radova *Web of Science*. Na odabranim člancima provedena je kvalitativna analiza kojom je ispitana uloga regulatornog okruženja pri usvajanju informacijske tehnologije u malim i srednjim poduzećima. Rezultati provedene analize ovoga rada istaknuli su značaj regulatornog okruženja u procesu usvajanja novih informacijskih tehnologija za mala i srednja poduzeća.

KLJUČNE RIJEČI: regulatorno okruženje, usvajanje, informacijske tehnologije, mala i srednja poduzeća

ABSTRACT: Small and medium-sized enterprises have become the backbone of economies around the world. In today's turbulent market, achieving and maintaining the

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competitive advantage of small and medium-sized enterprises largely depends on the timely recognition and adoption of information technology that will support daily operations. This paper aims to examine the influence of the regulatory environment adoption of new information technologies in the sector of small and medium enterprises. Therefore, the authors conducted a systematic literature review of scientific papers published in internationally recognized scientific journals or proceedings of internationally recognized scientific conferences indexed in the Web of Science database. A qualitative analysis of the selected articles was carried out, examining the role of the regulatory environment within information technology adoption in small and medium-sized enterprises. The results highlighted the importance of the regulatory environment in adopting new information technologies for small and medium-sized enterprises.

KEYWORDS: regulatory environment, adoption, information technology, small and medium-sized enterprises

1. INTRODUCTION

Nowadays, organizations have become dependent on information that enables them to have a competitive advantage in the market and, consequently, successful business operations. Every new technology represents a novelty that has to be implemented and adopted in a certain way in the usual business of the organization. Considering the constant growth and development of the technological innovation market, organizations will always have to keep up with technological progress in their business to meet consumers' needs, meet the demands of business partners and promptly respond to the competitor's next move. According to Bellini (2012), in the last 50 years, technological utilization has had a key influence on the shaping of organizations, starting from the fundamental use of software in business to today's digital software trends like the Internet of Things.

Bearing in mind how each organization is a distinctive, autonomous "organism" operating in different environments and under various circumstances, it is necessary to adopt information technology following its specific external characteristics. Also, many governments worldwide are prioritizing the concern for strategic SME development, given that modern economies are driven by small and medium-sized enterprises (Westman et al., 2019). Accordingly, it is crucial to consider the regulatory environment that influences successful information technology adoption in small and medium enterprises. Therefore, the main goal of this study is to examine the regulatory environment's impact on new information technology adoption in small and medium-sized enterprises.

Accordingly, this paper is organized as follows. The theoretical part of this paper is given in the second section. The next section introduces the chosen methodology of this paper. The results of the conducted systematic literature review are presented and discussed in the fourth section. Lastly, concluding remarks, recommendations for further research on this topic, and the limitations of this research have been represented in the fifth section of this paper.

2. INFORMATION TECHNOLOGY ADOPTION IN SMES

Small and medium-sized enterprises (micro-enterprises included) present 99% of the total number of all enterprises in the European Union (European Parliament, 2015). For an enterprise to be classified as a small or medium-sized enterprise, it is necessary to meet at least two of the three conditions, whereby the criteria regarding the number of employees and annual turnover or the number of employees and non-durable assets/assets are considered (EU-projekti.info, 2015). European Commission (2019) defines small and medium-sized enterprises are classified as follows. Small enterprises hire up to 50 workers and do not have a turnover of more than 10 million euros or do not have fixed assets/assets of more than 10 million euros (European Commission, 2019). On the other hand, enterprises that employ up to 250 workers and do not achieve a turnover of more than EUR 50 million or do not have fixed assets/assets of more than EUR 43 million are classified as medium-sized companies (European Commission, 2019).

Small and medium-sized enterprises are crucial creators of new jobs in countries worldwide. Economic prosperity depends on the quality and strength of the operations of small and medium-sized enterprises. At the same time, small and medium-sized companies achieve more than half of the total added value that all enterprises in the European Union achieve. In the territory of the European Union, about 23 million small and medium-sized enterprises realized about 3.9 billion euros of added value and created around 90 million new jobs in 2015 (European Parliament, 2015). Also, the rapid growth and business progress of most small and medium-sized enterprises is founded on the acceptance and application of radical innovations (European Parliament, 2015; Ministry of Science and Education, 2019). Therefore, it is crucial to note that small and medium-sized enterprises are the representatives of the entrepreneurial and innovative spirit in the European Union.

Information technologies and the changes imposed on organizations by their application generate many advantages for organizations. Also, information technology brings challenges and risks for which enterprises must be prepared. According to many authors (Flichy, 2008; Abd Rahman et al., 2013; Grimshaw, 2015), information and communication technology innovations are one of the key determinants of the impact on global advance and progress of the economy and society. Many authors emphasize the importance of government regulations in the adoption of new information technologies in small and medium-sized enterprises (Ifinedo, 2011; Quaddus and Hofmeyer, 2007; Grandon and Pearson, 2004). More intense government involvement through the provision of various incentives or subsidies that promote the adoption of innovative technological solutions in companies can support small and medium-sized companies in the process of making the decision to adopt new technologies (Roessner, 1988; Goldsmith, 1990; Quaddus and Hofmeyer, 2007). On the other hand, certain government regulations can also prevent or hinder the technology adoption process in small and medium-sized enterprises, which reduces the innovative potential of enterprises and, consequently, the economy in which such enterprises operate (Roessner, 1988; Quaddus and Hofmeyer, 2007).

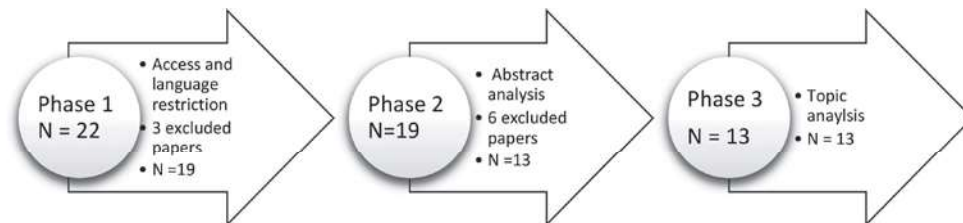
Accordingly, research and practical circles, from the very beginnings of research into the development of information technology, have recognized that the topic of proper adoption and application of such innovations, both by individuals and organizations as well as the government, is an important driver of economic development (Moore and Benbasat, 1991; Troshani et al., 2011).

3. METHODOLOGY

The systematic literature review method for this paper was carried out in October 2022 within the Web of Science database. The search process of the selected database of scientific papers was carried out in accordance with defined search keywords and search restrictions such as the language in which the paper was written. The defined keywords for the literature search were: “information technolog*” AND “adoption” AND “small and medium sized enterprise*” AND “government”. All papers written in the English language and indexed in the selected database of scientific papers until October 2022 were taken into account. Also, only papers published as journal articles or papers published in conference proceedings were considered.

The systematic literature review method implemented in this paper was carried out in three phases (1) access and language restriction (2) analysis of abstracts and (3) analysis of the topic. The third phase resulted in excluding papers whose topic was not dealing with the regulatory environment’s impact on information technology adoption in small and medium-sized enterprises. Therefore, 13 papers were selected for further in-depth qualitative analysis.

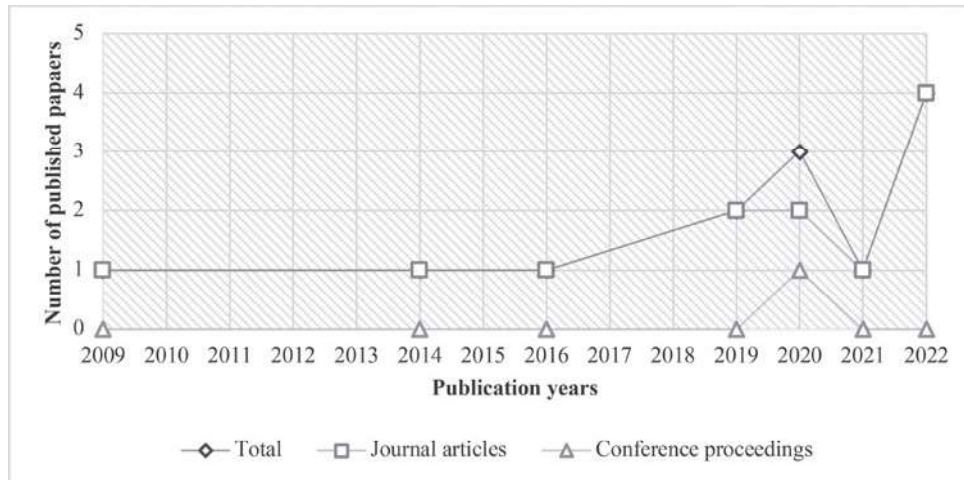
Figure 1 The search process



Source: Authors' work, 2022

4. RESULTS AND DISCUSSION

The frequency of 13 chosen papers included in further in-depth analysis, classified by publication types, through all publication years is shown in Figure 2. Selected papers dealing with the topic of regulatory environment influence on information technology adoption in small and medium-sized enterprises have mainly been published during 2020 and 2022. Interest in the chosen topic was perceptible but lesser from 2009 to 2019, including 2021. Furthermore, selected papers are primarily published as journal articles, while papers published as articles in conference proceedings are still lacking. Obtained results can be explained by the COVID-19 pandemic in which most conferences were postponed due to the social distancing measures to prevent the further spreading of the COVID-19 disease.

Figure 2 Number of papers published within the Web of Science database from - till 2022

Source: Authors' work, 2022

Furthermore, all the selected papers were analyzed and classified concerning (i) the model/theory of technology acceptance in small and medium-sized enterprises that they apply in their work (ii) the information technology that they process in their work in the context of adoption in small and medium-sized enterprises (iii) the context observations of the regulatory environment and (iv) the type of research conducted in the work. All 14 papers categorized according to the above criteria are listed in Table 1.

No	Reference	IT adoption model/ theory/framework	Technology	Regulatory environment context in IT adoption in SMEs		Research
				Regulatory environment as actuator	Regulatory environment as an obstacle	
1	Vu and Nguyen (2022)	Authors' work	General IT	√	√	Quantitative research
2	Lutfi et al. (2022)	Diffusion of innovation, institutional factors, and Technology Organization Environment Framework	Enterprise resource planning systems	√	∅	Quantitative research
3	Maphosa and Maphosa (2022)	Diffusion of Innovation Model (DIM) theory and Technology Organization Environment Framework	General ICT in remote working	√	√	Quantitative research
4	Al-Okaily et al. (2022)	Unified theory of acceptance and use of technology	Cloud-based accounting information systems	√	∅	Quantitative research

No	Reference	IT adoption model/ theory/framework	Technology	Regulatory environment context in IT adoption in SMEs		Research
				Regulatory environment as actuator	Regulatory environment as an obstacle	
5	Apfel and Herbes (2021)	Unified Theory of Acceptance and Use of Technology model	Renewable Energy Technologies	√	√	Qualitative research
6	Chege, Wang, and Suntu (2020)	The five-stage growth model and the product-process model of innovation	General technology innovation	√	√	Quantitative research
7	Sibanda et al. (2020)	∅	Disruptive digital technology	√	√	Quantitative research
8	Alsafi and Fan (2020)	∅	Cloud computing	∅	√	Qualitative research
9	Lu et al. (2019)	Diffusion of Innovation Model theory and Technology Organization Environment Framework	General ICT	√	∅	Quantitative research
10	Utami et al. (2019)	∅	Mobile commerce	√	∅	Qualitative research
11	Awiagah, Kang and Lim (2016)	Theory of planned behaviour and Technology Organization Environment Framework	E-commerce	√	∅	Quantitative research
12	Hung et al. (2014)	E-readiness framework	Corporate website	√	∅	Quantitative research
13	Hua, Rajesh, and Theng (2009)	∅	Electronic commerce	√	∅	Quantitative research

Source: Authors' work, 2022

Obtained results show how authors of analyzed papers focus on different information technologies when observing their adoption in small and medium-sized enterprises like enterprise resource planning systems, cloud-based solutions, renewable energy technologies, disruptive digital technologies, mobile and electronic commerce, etc. To investigate the adoption of named information technology in small and medium-sized enterprises, authors of most papers use different frameworks and theories for examining technology adoption like Diffusion of innovation theory; Technology, Organization and Environment framework; Unified theory of acceptance and use of technology model; Theory of planned

behaviour, etc. To achieve their research goals, most of the analyzed papers have been employing the quantitative research method in their studies, while a lesser extent of authors has been using different qualitative research approaches in their works.

Considering the context of the regulatory environment's influence on the various information technologies adoption in small and medium-sized enterprises, most of the papers observed the determinant of the regulatory environment as the actuator of the new technologies' adoption process. According to various authors, government support is one of the crucial factors affecting technology adoption in small and medium-sized enterprises worldwide (e.g. Lutfi, et al., 2022; Chege, Wang, and Suntu, 2020; Kleine, 2015; Seyal et al., 2004; Awiagah, Kang, and Lim, 2016; Lu et al., 2019). The authors agree that governments around the world should develop various policies, support programs, and regulations to encourage the effective adoption of diverse information technologies in small and medium-sized enterprises (e.g. Chege, Wang and Suntu, 2020; Awiagah, Kang and Lim, 2016; Vu and Nguyen, 2022; Lutfi et al., 2022; Hung et al., 2014; Utami et al., 2019). According to Zhu and Kraemer (2007) and Awiagah, Kang, and Lim (2016) properly established regulatory environment in the context of delivering suitable government policies and regulations, improves the integrity of transactions and supports private investments. Moreover, authors Chege, Wang, and Suntu (2020) in their work stress the key goals on which defined government policies should focus, for example: enhancing technology infrastructure, founding centers of technological resources, encouraging and emphasizing technological innovations and technological external resources to achieve the efficiency of the operations of small and medium-sized enterprises. Similarly, the authors Sibanda et al. (2020) point out that government initiatives in the context of ensuring quality physical telecommunications and Internet infrastructure are very important for facilitating the process of adopting new technologies in small and medium-sized enterprises. For example, the Singapore government has ratified more favorable e-commerce legislation to enable the development of the necessary e-commerce infrastructure for small and medium-sized enterprises (Al-Hawamdeh, 2002; Awiagah, Kang, and Lim, 2016). In addition to infrastructure support, some other governments support small and medium-sized enterprises in the adoption of information technology by offering more favorable loans, tax exemptions, microfinancing opportunities, etc. (Fang et al., 2015; Sibanda et al., 2020; Maphosa and Maphosa, 2022; Vu and Nguyen, 2022; Apfel and Herbes; 2021). For example, to financially support small and medium-sized enterprises to adopt new digital technologies, the government of the United Arab Emirates has launched a platform for financing such enterprises based on the mGovernment initiative and vision for 2021 (Sibanda et al., 2020). Furthermore, many authors discuss in their works that the relevant government agencies should also focus on encouraging innovation activities in small and medium-sized enterprises by increasing the number of training in the field of entrepreneurship and the application of information and communication technology (Chege, Wang, and Suntu, 2020; Al-Okaily, et al., 2022; Vu and Nguyen, 2022) and consequently establishing an innovative culture in small and medium-sized enterprises (Hua, Rajesh and Theng, 2009).

On the other hand, a smaller number of works considered the determinant of the regulatory environment as an obstacle to the adoption of new technologies in small and medium-sized enterprises. Hence, different authors in their works emphasize how the regulatory environment can delay the adoption process of new technology in small and medium-sized enterprises (e.g. Chege, Wang, and Suntu, 2020; Franco and Mario, 2017; Alsafi and Fan,

2020; Apfel and Herbes; 2021; Vu and Nguyen, 2022; Lutfi et al., 2022; Maphosa and Maphosa, 2022). In their works, many authors argue how regulatory environment uncertainty like inconsistencies in existing regulations and excessive institutional and bureaucratic complexity can unintentionally negatively affect the adoption of technologies in small and medium-sized enterprises, given the higher financial expenses that cause administrative procedures that are difficult to overcome (Sibanda et al.; 2020; Hung et al., 2014; Vu and Nguyen, 2022; Boudreaux, 2017). Generally, most authors agree that the lack of proper government support represents a crucial obstacle for small and medium-sized enterprises to adopt diverse information technologies (e.g. Alsafi and Fan, 2020; Vu and Nguyen, 2022). Insufficient government support usually concerns the problem of insufficient financial assistance from the government that supports small and medium-sized enterprises to adopt new technologies (Alsafi and Fan, 2020; Basahel, Yamin and Drijan, 2016; Vu and Nguyen, 2022; Doh and Kim, 2014). In addition, the adoption of new technologies by small and medium-sized enterprises is also negatively affected by the present corrupt actions within countries that increase the costs of business innovation, as well as the insufficient exchange of knowledge that will support innovative activities (Anokhin and Schulze, 2009; Tebaldi and Elmslie, 2013; Vu and Nguyen, 2022). Although the regulatory environment can make it difficult for small and medium-sized enterprises to adopt information technologies, it is crucial to apprehend that sometimes the government provides instruments and initiatives to encourage adopting new technologies in named enterprises, yet, they are either not informed about such possibilities or do not know how to employ them (Apfel and Herbes; 2021).

5. CONCLUSION

This paper employs a systematic literature review method on the topic of the regulatory environment's impact on information technology adoption in small and medium-sized enterprises. Obtained results showed the highest number of published papers dealing with the chosen topic in 2020 and 2022. Analyzed papers were mainly published as journal articles using quantitative research methods to investigate the adoption of various information technologies (e.g. enterprise resource planning systems, cloud-based solutions, renewable energy technologies, disruptive digital technologies, mobile and electronic commerce, etc.) in small and medium-sized enterprises, thus, employing diverse technology adoption theories and frameworks (e.g. Diffusion of innovation theory; Technology, Organization, and Environment framework; Unified theory of acceptance and use of technology model; Theory of planned behaviour, etc.). Further analysis of selected papers indicated that the regulatory environment could have either a driving or hindering role in the information technology adoption process in small and medium-sized enterprises. To contribute to the successful adoption of new technologies within small and medium-sized enterprises, it is crucial to establish a stable and stimulating regulatory environment. With this in line, every government must provide various educational initiatives, supportive policies, instruments, regulations, financial incentives, and legal adjustments that can contribute to the easier and more efficient adoption of new technologies in small and medium-sized enterprises. Consequently, such a regulatory environment could support the development and innovation of economies worldwide, as well as their more efficient cooperation on a global level.

The selection of databases for the literature search represents the limitation of this paper. Although the Web of Science is a favorably valued database, authors have to be aware of the risk that some relevant works published in journals and proceedings that are not indexed in the Web of Science are not included in the research. Therefore, future research on this topic should include more databases as well as the different or extended combinations of keywords used in process of searching relevant literature. Also, further researchers that are interested in this topic could conduct case studies to gain detailed results from the in-depth qualitative analysis of the observed topic.

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