

ENHANCING ECONOMIC MANAGEMENT WITH INFORMATION TECHNOLOGY: INSIGHTS FROM COVID-19 IN BOSNIA AND HERZEGOVINA THROUGH THE LENS OF MACHINE LEARNING METHODS

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ABSTRACT

This paper explores the role of information technology in enhancing the efficiency of economic management during the COVID-19 pandemic. The research aim was to investigate how the integration of information technology, data usage, and analytics, digital transformation of the financial sector, ensuring digital inclusion and cyber security can contribute to improving economic management in times of crisis. The research methodology involved data collection through a questionnaire that asked participants a series of questions about their attitudes and perceptions regarding the integration of information technology and its impact on the efficiency of economic management during the pandemic. The data were analyzed using the chi-square statistical method to determine the existence of significant relationships between variables. The results indicate that information technology is a key factor in strengthening economic management during the COVID-19 pandemic. The integration of information technology, data usage, and analytics, digital transformation of the financial sector, and ensuring digital inclusion and cyber security can enhance efficiency, transparency, and stability during crisis times. The research emphasizes the need for investment in information technology, the development of implementation strategies, strengthening cyber security, and ensuring digital inclusion as key steps towards building a more resilient economic environment during the pandemic. Further research and implementation of these technologies in practice are recommended to achieve sustainable economic development and successful crisis management.

Keywords: *information technology, machine learning, COVID-19 pandemic, data usage and analytics, digital transformation, digital inclusion, cyber security*

1. INTRODUCTION

In today's global business environment, every company, regardless of its size, strives to improve its operations and achieve higher profits. However, the emergence of the COVID-19 virus pandemic has suddenly impacted many businesses, forcing them to reduce production or even temporarily suspend their activities to alleviate financial obligations. The economic situation, both at the global level and in countries like Bosnia and Herzegovina, has rapidly deteriorated due to frequent work stoppages, business closures, and mass layoffs. This has resulted in an increase in unemployment rates and added pressure on budgets, particularly in poorer

countries. Furthermore, we are facing a trend of increasing emigration among young people and dissatisfied employees from Bosnia and Herzegovina, who are leaving the country in search of a better, safer, and more promising life. This phenomenon of emigration is not specific to our country alone; it is also occurring in other countries in the region. However, Bosnia and Herzegovina is experiencing a significantly higher emigration trend compared to other countries.

The pandemic also had a tremendous impact on the economy, and China became the first country to demonstrate that the spread of the virus could be halted. However, the question arises as to the cost of such a victory. In addition to economic losses in terms of lost income, business failures, and increased unemployment, it is important to emphasize the significance of timely, quality, open, and categorized data and statistics during the pandemic. Such data is crucial for understanding, managing, and mitigating the human, social, and economic effects of the pandemic, as well as designing short-term responses and accelerated actions to get countries back on track towards achieving sustainable development goals.

Managing the economy in crisis scenarios, such as the recent COVID-19 pandemic, requires innovative solutions that can provide adequate responses to the challenges faced by the global community. One key aspect of such solutions is the application of information technology (IT) to improve economic management and ensure its stability in these extraordinary situations. Integrating IT into economic strategies during crisis scenarios can bring significant advantages, but it also presents challenges that require careful planning and implementation.

Accordingly, this research aims to explore the applications of information technology as innovative solutions for managing the economy in an international crisis scenario, with a particular focus on the COVID-19 pandemic. The main objective of the research is to identify key factors, advantages, and challenges in integrating information technology into economic strategies in such crises.

Within this study, the focus will be directed on the impact of the COVID-19 pandemic on the economy, specifically on economic management and the application of information technology (IT) as a key factor for effective crisis management. This paper will address the theoretical framework encompassing information technology in economic management, crisis management, and the economy, the integration of information technology into economic strategies during crises, as well as the theoretical foundations and models of applying information technology in economic management during crises.

This research aims to analyze theoretical concepts and models to gain a deeper understanding of the integration of information technology into economic practice during crises. In this way, the research will contribute to a better understanding of the importance of information technology in overcoming the economic challenges posed by the pandemic and provide guidelines for managing and applying information technology in the economic context of crises.

The subsequent chapters will delve into a detailed examination of the theoretical framework and previous research to gain a broader understanding of this topic and identify key aspects for further analysis. The research methodology, data collection, and analysis of results will also be presented, which will contribute to a better understanding of the role of information technology in economic management during crises.

2. THEORETICAL BACKGROUND

Information technology (IT) has become a key factor in modern economic management. In the context of crises, such as the global COVID-19 pandemic, IT has the potential to transform

the way economy is managed and enables organizations to effectively respond to unforeseen changes and minimize negative impacts. IT provides organizations with tools and resources for real-time data collection, processing, storage, and analysis. This allows decision-makers to have timely and relevant information at their disposal, which is crucial for efficient management of the economy during crises.

Crisis management involves a set of strategies, policies, and measures that organizations implement to deal with crises and mitigate their negative effects. In the economy, crises, such as natural disasters, economic recessions, or global pandemics, can have a wide range of negative consequences on various sectors and aspects of the economy. Managing the economy during these crises requires the ability to adapt quickly, allocate resources efficiently, and make informed decisions. In this context, the integration of information technology into economic strategies becomes critical for achieving successful outcomes.

Bessonova and Battalov (2021) consider digitalization to drive the strategic development of the global economy. Digital technologies accelerate economic progress by enabling the flow of ideas and data (Wendt, Adam, Benlian & Kraus, 2021). Governments worldwide are increasing investments in innovation in response to the COVID-19 pandemic, aiming to assist humanity in coping with the crisis through intensified scientific research, expanded research and development activities, and increased patent applications (Guderian, Bican, Riar & Chattopadhyay, 2021; Soumitra et al., 2021). Innovative technologies enhance business analysis and forecasting, new product creation, order processing, logistics, factory automation, quality control, and marketing (Jemala, 2021). Wang, Zhang, and Verousis (2021) examine the impact of the pandemic duration on innovation output and suggest that policies guiding innovative firms are on the right path and their recovery time is reduced. Business Model Innovation (BMI) can help small and medium-sized enterprises remain competitive during crises while focusing on revenue generation and value addition (Adam & Alarifi, 2021; Clauss, Breier, Kraus, Durst & Mahto, 2022; Ibarra, Bigdeli, Igartua & Ganzarain, 2020). Open innovation activities (interaction with consumers and open exchange of knowledge on market requirements and technological possibilities) can be beneficial in minimizing the impact of COVID-19 on education, the economy, and leisure time (Almeida, 2021; Surya et al., 2021). In the future, innovation differences will be evident in various industries and economies. Therefore, it is necessary to enhance innovation ecosystems to reduce imbalances between sectors (such as ICT, the pharmaceutical industry, research and development, hospitality, or the automotive industry) by investing in new technologies and business strategies.

Over the past two years, various research studies have focused on innovation as a cutting-edge strategy for surviving situations like the COVID-19 pandemic, emphasizing the critical importance of innovation (e.g., Sharma, Lopes de Sousa Jabbour, Jain & Shishodia, 2022). The outbreak of the COVID-19 pandemic has caused damage to economies worldwide (García-Carbonell, Martín-Alcázar & Sánchez-Gardey, 2021). Additionally, due to the COVID-19 pandemic, small and medium-sized enterprises, in particular, face various problems and obstacles (e.g., Emami, Ashourizadeh, Sheikhi & Rexhepi, 2021). The lockdowns and movement restrictions imposed by governments in many countries have severely impacted the operations of small and medium-sized enterprises, weakened their financial status, and exposed them to financial risk (Omar, Ishak & Jusoh, 2020). As a result, many organizations have been unable to solve the problem (Ozili, 2020). Insufficient research has been conducted on the impact of external support received by small and medium-sized enterprises after the COVID-19 epidemic on their efficiency and survival (except for Song, Yang & Tao, 2020). In the case of a pandemic, organi-

zations need to adapt to new technologies and financial applications. The role of innovation and initiatives is crucial in the post-COVID-19 period.

Mićić and Mastilo (2022) provide general effects of the pandemic to digital transformation of businesses all over the globe, mostly connected to analysis of the employees' workplace preference. The research focus is on digital workplace transformation. Results show that COVID-19 has embraced and sped up the process of workplace innovation and that it created new opportunities to further workplace developments in accordance to employee preferences.

Mašić, Vladušić and Nešić (2018) explore and present the importance of digital transformation and innovations. Companies should strive to build collaborative relationships as a means to creating transformational growth. Results show that information and communications technologies are significant in the process of strategic planning. The Paper also emphasizes the importance of organizational structure and culture required for implementing strategies that are aligned with digital transformation.

Integrating information technology into economic strategies during crises is a key factor in achieving efficient economic management. The integration of IT tools, systems, and infrastructure allows organizations to collect, analyze, and interpret data in real-time. These data provide deeper insights into market changes, consumption trends, changes in consumer behavior, and economic indicators. Based on this information, organizations can make informed decisions regarding resource allocation, strategy selection, and future planning. The integration of information technology also facilitates the automation of business processes, leading to greater efficiency and productivity.

Various theoretical foundations and models can be applied to the integration of information technology in economic management during crises. Some of these models include the theory of digital transformation, which emphasizes the need for organizational change and adaptation to the digital era; the theory of data and analytics, which highlights the importance of data collection and analysis for informed decision-making; the theory of digital inclusion, which deals with access to information technology and ensuring a balance in digital development; and the theory of cyber security, which focuses on protecting information technology from cyber-attacks and threats.

3. MATERIALS AND METHODS

3. 1. RESEARCH DESIGN AND HYPOTHESES DEVELOPMENT

The research subject encompasses the role of information technology in economic management during the COVID-19 pandemic. Different aspects of digital transformation, data and analytics, digitalization of the financial sector, digital inclusion, and cyber security will be analyzed in the context of economic management during the pandemic.

The main research problem is how to effectively integrate information technology into economic strategies to adequately manage the economy during the COVID-19 pandemic. Additionally, the research will focus on identifying challenges that may arise in the implementation of information technology and finding solutions to overcome these challenges in the context of the pandemic. This research aims to explore the applications of information technology as innovative solutions for economic management during the COVID-19 pandemic. The focus will be

on identifying key factors, benefits, and challenges in the integration of information technology into economic strategies in the context of the pandemic.

Based on these considerations, the hypothesis for this study is as follows: **“Integrating information technology into economic strategies during the COVID-19 pandemic enhances overall economic management.”**

This research employed a questionnaire survey as the primary method for data collection. The survey aimed to gather insights from experts in the fields of information technology, economics, and crisis management regarding the applications of information technology in economic management during the COVID-19 pandemic. The survey questionnaire was carefully designed to address the research objectives and included questions related to various aspects of information technology integration, such as digital transformation, data and analytics, digitalization of the financial sector, digital inclusion, and cyber security.

The participants in this study were selected based on their expertise in the relevant fields. A purposive sampling approach was employed to ensure that the respondents had a strong background in information technology, economics, or crisis management. The sample consisted of professionals and experts from various organizations and sectors in Bosnia and Herzegovina. The total number of participants included in the study was 100.

The online survey was conducted electronically using an online survey platform in January and February 2023. The participants were invited to complete the survey, which consisted of multiple-choice and open-ended questions. The survey was administered over a specified period, allowing participants to respond at their convenience. The collected data included responses to the survey questions, demographic information, and any additional comments or suggestions provided by the participants.

3. 2. DATA ANALYSIS

The collected data were analyzed using the IBM SPSS Statistics 26 software. Descriptive statistics were employed to examine the distribution of responses and demographic characteristics of the participants. Furthermore, inferential statistical techniques, including Chi-Square tests, were utilized to assess the relationships between variables and test the research hypotheses. The significance level was set at $p < 0.05$ to determine statistical significance.

Ethical guidelines were followed throughout the research process. Participants were assured of the confidentiality and anonymity of their responses. Informed consent was obtained from all participants, and they were informed about the purpose of the study. The research was conducted in compliance with relevant data protection and research ethics regulations.

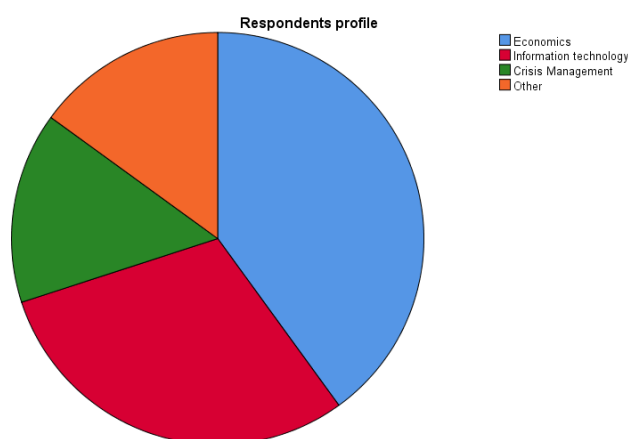
3. 3. LIMITATIONS

It is important to acknowledge certain limitations of this study. Firstly, the findings are based on self-reported data, which may be subject to response bias. Secondly, the generalizability of the results may be limited due to the specific sample characteristics and the use of a questionnaire survey. Finally, the study focused on a specific context (COVID-19 pandemic) and may not fully capture the long-term implications of information technology integration in economic management.

4. RESULTS AND DISCUSSION

40% of the respondents belong to the field of economics, 30% of the respondents work in the field of information technology, 15% of the respondents work in the field of crisis management, while 10% of the respondents indicated belonging to other categories. The total number of respondents is 100, which constitutes 100% of the total population included in the research.

Figure 1. Respondent's profile



Source: Author's independent creation

Table 1 shows how familiar respondents are with the integration of information technologies (IT) during a crisis period.

Table 1. Familiarity with the integration of information technologies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	50	50,0	50,0	50,0
	Partial familiar	40	40,0	40,0	90,0
	Not familiar	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

According to the table, 50% of the respondents identified themselves as "Very familiar" with the integration of information technologies. Partial familiarity with the integration of information technologies was stated by 40% of the respondents, while 10% of the respondents claimed to be unfamiliar with this topic.

Table 2. Do you believe that the integration of information technologies can improve the efficiency of economic management in an international crisis scenario?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	80	80,0	80,0	80,0
	No	10	10,0	10,0	90,0
	Not sure	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

Out of a total of 100 respondents, 80% (80 respondents) answered affirmatively, believing that the integration of information technology can improve the efficiency of economic management in a crisis scenario. The remaining respondents, 10% (10 respondents), answered negatively, while another 10% (10 respondents) stated that they are not sure or had no specific opinion on this topic. These results indicate a majority positive opinion among the respondents regarding the role of information technology in enhancing the efficiency of economic management in an international crisis scenario.

Table 3. How much do you believe that the use of machine learning can provide relevant information for decision-making in crises?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Can provide relevant data completely	60	60,0	60,0	60,0
	Can provide relevant data partially	30	30,0	30,0	90,0
	Cannot provide relevant data	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

Out of a total of 100 respondents, 60% (60 respondents) believe that the use of data and analytics can provide relevant information completely for decision-making in crises. An additional 30% (30 respondents) state that the use of machine learning partially provides relevant information for decision-making in crises. Only 10% (10 respondents) believe that the use of machine learning cannot provide relevant information for decision-making in crises. These results indicate a majority positive opinion among the respondents regarding the importance of using data and analytics for making informed decisions in crises.

Table 4. Do you think that the digital transformation of the financial sector can enhance the stability and transparency of financial flows in times of crisis using statistical methods?

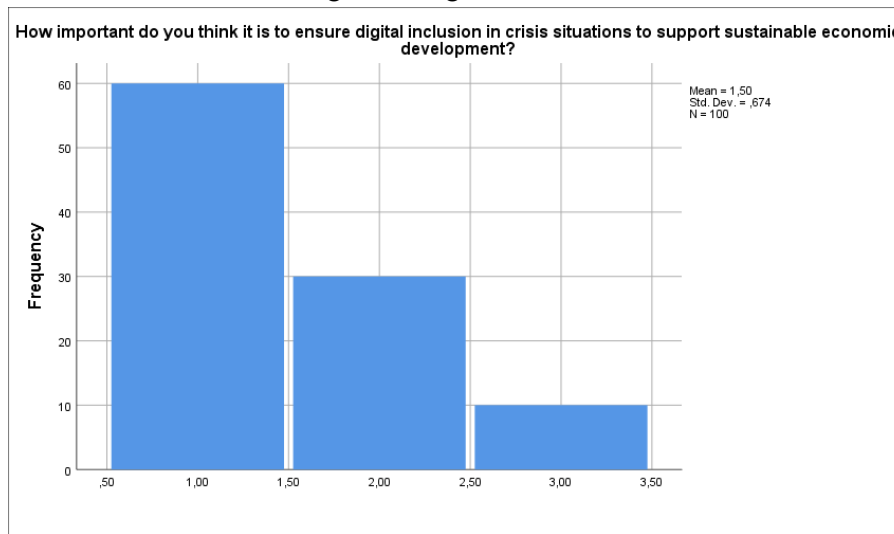
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	70	70,0	70,0	70,0
	No	20	20,0	20,0	90,0
	Not sure	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

70% (70 respondents) believe that digital transformation can enhance the stability and transparency of financial flows in times of crisis. 20% (20 respondents) state that digital transformation

cannot improve the stability and transparency of financial flows in times of crisis. 10% (10 respondents) are unsure about it.

Figure 2. Digital inclusion



Source: Author's independent creation

Figure 2 provides answers to the question “How important do you think it is to ensure digital inclusion in crises to support sustainable economic development?” When we connect the results from Table 4 and Figure 2, we can see that the majority of respondents believe that digital transformation of the financial sector can enhance the stability and transparency of financial flows in times of crisis. Additionally, most respondents consider it important to ensure digital inclusion in crises to support sustainable economic development. These results indicate the recognition of the importance of digital technologies in the financial sector and their role in improving stability, transparency, and inclusion in crises.

Table 5. Do you consider cybersecurity to be crucial for protecting information technologies and economic systems in crises?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	80	80,0	80,0	80,0
	No	10	10,0	10,0	90,0
	Not sure	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

The results in Table 5 indicate that the majority of respondents recognize the importance of cybersecurity for protecting information technologies and economic systems in crises. This highlights an awareness of the potential threats that cyber attacks can pose to the information infrastructure and economy during crises. These results emphasize the need for adequate cybersecurity measures to ensure the protection of information technologies and economic systems. Cybersecurity is a crucial factor in preserving the confidentiality, integrity, and availability of data, as well as preventing financial losses and maintaining business continuity during times of crisis. It is important to note that there are also respondents who are unsure or have an unclear stance on this issue. This may indicate a lack of awareness or information regarding the importance of cybersecurity in the context of protecting information technologies and economic

systems in crises. Therefore, it is necessary to provide education and raise awareness on this matter to improve understanding and support for cybersecurity in crises.

Table 6. The greatest challenge in the application of information technologies in an international crisis scenario is:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cyber attacks	50	50,0	50,0	50,0
	lack of infrastructure	32	32,0	32,0	82,0
	lack of expertise	18	18,0	18,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

The results in Table 6 indicate important factors that can limit the effective implementation of information technologies in managing the economy in international crisis scenarios. Cyber attacks are considered the greatest challenge (50% of respondents), highlighting the increasing threat of cybercrime and the need for adequate cybersecurity measures.

The lack of infrastructure (32%) is also highlighted as a significant factor that can hinder the application of information technologies in crises. Insufficient or inadequate infrastructure can limit the availability and reliability of information technologies, making it more difficult to effectively manage the economy in a crisis scenario.

Furthermore, the lack of expertise (18%) has been identified as a significant challenge. The shortage of skilled professionals with relevant skills and knowledge can diminish the ability to effectively implement information technologies in crisis management. These results emphasize the importance of investing in cybersecurity, infrastructure, and the development of skilled workforce to overcome challenges and maximize the benefits of information technologies in international crisis scenarios. They also underscore the need for continuous education and training of professionals to ensure their proficiency in effectively utilizing information technologies in crisis management.

Table 7. The aspect of information technologies considered most significant for effective management of the economy in crises is:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Integration of IT	30	30,0	30,0	30,0
	Use of data and analytics	40	40,0	40,0	70,0
	Digital transformation	20	20,0	20,0	90,0
	Digital inclusion	5	5,0	5,0	95,0
	Cybersecurity	5	5,0	5,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

The results indicate the importance of integrating information technologies, using data and analytics, digital transformation, digital inclusion, and cybersecurity for effective management of the economy in crises. The integration of information technologies stands out as a crucial aspect, implying the need to align IT infrastructure, applications, and systems to achieve synergy and better coordination in crisis management. The use of data and analytics is also recognized

as a key aspect of making informed decisions in crises. Efficient data collection, analysis, and interpretation can provide relevant information and support real-time decision-making.

Digital transformation, which encompasses changes in business models, processes, and technologies, is also recognized as a significant aspect of achieving stability and transparency of financial flows in crisis times. The importance of digital inclusion emphasizes the need to ensure access to information technologies for all segments of society to overcome inequalities and support sustainable economic development in crises. Cybersecurity is also considered a significant aspect, given the increasing threat of cyber attacks. Protecting information technologies and economic systems from cyber threats is crucial for preserving stability and trust in times of crisis.

These results highlight the importance of various aspects of information technologies in managing the economy in crises. Proper integration, use of data and analytics, digital transformation, digital inclusion, and cybersecurity can be key factors in successfully addressing challenges and achieving effective economic management in times of crisis.

Table 8. Additional comments or suggestions regarding the application of information technologies in managing the economy in crises:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strengthening collaboration between sectors	75	75,0	75,0	75,0
	the need for training and education	15	15,0	15,0	90,0
	establishment of clear regulations	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Source: Author's independent creation

Out of a total of 100 respondents, 75% (75 respondents) emphasize strengthening collaboration between sectors as a key suggestion for the application of information technology in managing the economy in crises. This implies the need to establish cooperation and coordination between the public sector, private sector, and civil society to achieve a synergistic approach in the implementation of information technology in crises.

15% (15 respondents) mention the need for training and education as an additional comment or suggestion. This highlights the importance of continuous education and training of IT professionals to ensure their proper implementation and use in crisis management.

Another 10% (10 respondents) emphasize the establishment of clear regulations as an additional suggestion for the application of information technology in managing the economy in crises. This underscores the importance of legal regulations and policies that will support security, transparency, and accountability in the use of information technology in crises.

These additional comments or suggestions indicate the need for collaboration among sectors, continuous training and education of professionals, and the establishment of clear regulations to achieve successful implementation of information technology in managing the economy in crises. These suggestions are important because they emphasize that the application of information technology is a complex process that requires a holistic approach and coordinated efforts from various stakeholders.

Table 9. Test Statistics

Test Statistics			
	Chi-Square	df	Asymp. Sig.
Do you consider that the integration of information technologies can enhance the efficiency of managing the economy in an international crisis scenario?	98,000 ^a	2	,000
How much do you believe that the use of ML techniques can provide relevant information for decision-making in crises?	38,000 ^a	2	,000
Do you think that cyber security is crucial for protecting information technologies and economic systems in crises?	98,000 ^a	2	,000
Do you believe that the digital transformation of the financial sector can improve the stability and transparency of financial flows in crisis times?	62,000 ^a	2	,000
How important, in your opinion, is it to ensure digital inclusion in crises for supporting sustainable economic development?	38,000 ^a	2	,000
a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 33,3			

Source: Author's independent creation

The results presented in the table represent the values of the test statistic, degrees of freedom (df), and p-values for each hypothesis. The p-value indicates the statistical significance of the results, and lower values indicate higher statistical significance. In our case, all p-values are very small (0.000), indicating statistically significant results for all tested hypotheses. This means that our hypotheses are confirmed based on the available data. Based on the results of the conducted research, we can draw the following conclusions:

The results of the survey questionnaire indicate that all questions related to the integration of information technology into economic strategies during crisis times are statistically significant. All Chi-square tests have very low p-values ($p < 0.001$), indicating significant associations between the integration of information technology and aspects of economic management during the pandemic.

Specifically, the results show that survey participants believe that the integration of information technology can enhance the efficiency of economic management in crisis scenarios (Chi-square = 98.000, $df = 2$, $p = 0.000$). They also believe that the use of machine learning (ML) can provide relevant information for decision-making during crises (Chi-square = 38.000, $df = 2$, $p = 0.000$). Furthermore, they consider cybersecurity to be crucial for protecting information technology and economic systems during crises (Chi-square = 98.000, $df = 2$, $p = 0.000$). Survey participants also recognize that the digital transformation of the financial sector can improve the stability and transparency of financial flows in crisis times (Chi-square = 62.000, $df = 2$, $p = 0.000$). Additionally, they believe that ensuring digital inclusion is important for supporting sustainable economic development during crises (Chi-square = 38.000, $df = 2$, $p = 0.000$).

Based on the statistically significant results, we can conclude that the survey results support the hypothesis. The integration of information technology into economic strategies during the COVID-19 pandemic enhances overall economic management, as suggested by the survey participants.

5. CONCLUSION

The COVID-19 pandemic represents a global crisis that has had a dramatic impact on the economy and requires innovative approaches to management. In this context, information technologies have proven to be a key tool for improving the efficiency of economic management, making informed decisions, and ensuring the stability of financial flows.

Our research has confirmed that the integration of information technologies into economic strategies can significantly improve the efficiency of management during the COVID-19 pandemic. Test results show a statistically significant correlation between the integration of information technologies and management efficiency. The use of data and analytics also stands out as a crucial factor in providing relevant information for decision-making in crises. The analysis has shown a statistically significant relationship between the use of data and analytics and informed decision-making in economic management during the pandemic.

The digital transformation of the financial sector also has significant potential for enhancing the stability and transparency of financial flows during the pandemic. Our research has confirmed a statistically significant correlation between the digital transformation of the financial sector and improved stability and transparency of financial flows. This highlights the importance of continued investment in digital technologies and innovations to strengthen the financial sector and reduce vulnerability during crisis times. Ensuring digital inclusion has also been shown to be an important factor in supporting sustainable economic development during the pandemic. Our research has confirmed a statistically significant relationship between digital inclusion and overcoming inequalities in access to information technologies. Involving all segments of society in digital processes and providing access to information technologies can create balance and support sustainable economic development during crisis times. We have also demonstrated that cybersecurity is crucial for protecting information technologies and economic systems during the COVID-19 pandemic. Cyberattacks can seriously compromise the stability and integrity of information technologies and economic systems. Therefore, it is imperative to pay attention to strengthening cybersecurity and adopting appropriate measures to protect digital resources. Overall, the results of our research confirm that information technologies are a key factor in improving economic management during the COVID-19 pandemic. The integration of information technologies, the use of data and analytics, digital transformation of the financial sector, ensuring digital inclusion, and cybersecurity play a critical role in enhancing efficiency, transparency, and stability during crisis times. However, it is important to note that information technologies alone are not the solution to all problems. Their successful implementation requires a clear strategy, adequate investment, employee education, and partnerships between the public and private sectors. It is also necessary to consider security aspects and protect data privacy to maintain user trust and prevent potential misuse. In light of our findings, it is recommended that governments, organizations, and economic actors actively promote the integration of information technologies, invest in digital resources, ensure digital inclusion, improve cybersecurity, and support innovation in economic management during the pandemic. These efforts will contribute to strengthening economic capacities, overcoming crises, and creating a more resilient economic environment. Additionally, future research can deepen our understanding of specific mechanisms and factors that influence the success of implementing information technologies in economic management during crisis times. This knowledge can be valuable for developing

policies, strategies, and practices that better address specific needs and challenges in a given context.

In conclusion, information technologies are a powerful tool for improving economic management during the COVID-19 pandemic. The integration of information technologies, the use of data and analytics, the digital transformation of the financial sector, ensuring digital inclusion, and cybersecurity have the potential to enhance efficiency, transparency, and stability during crisis times. Overall, investment in information technologies and their proper implementation can provide sustainable solutions for economic management in challenging situations such as a pandemic.

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