Advanced Engineering Science
http://publish.mersin.edu.tr/index.php/ades
e-ISSN 2791-8580

Internet of Things in the development of future businesses in Albania

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Cite this study: Mema, B., & Basholli, F. (2023). Internet of Things in the development of future businesses in Albania. Advanced Engineering Science, 3, 196-205

Keywords
IoT
Business
Network
Technology

Research Article
Received:26.09.2023
Revised: 25.10.2023
Accepted: 01.11.2023
Published:05.11.2023

Abstract

Internet of Things (IoT) refers to a technology that connects various devices and objects, leading to a digital revolution in different aspects of life. It has the potential to create highly efficient and rewarding smart environments for individuals. The IoT not only impacts our daily lives but also significantly influences how we work and conduct business. IoT, which links people, businesses, and intelligent objects, aims to profoundly alter how we live, work, and interact. It also has the potential to reinvent a wide range of business sectors. The goal of this conceptual paper is to establish a picture of how the IoT can change business models and the methods through which people and organizations produce value. The goal of this conceptual paper is to establish a picture of how the IoE can change business models and the methods through which people and organizations produce value. This article focuses on IoT technology and how it affects businesses, emphasizing how crucial it is for such organizations to be ready for and able to adapt to the changes it brings. It emphasizes the need for businesses and industries to incorporate this technology into their operations to enhance their business models, increase productivity, improve efficiency, and reduce costs. Let's see if SMEs (Small and Medium Enterprises) in Albania can benefit from the further advancement of IoT, what are the expectations, possibilities, and potential risks that may arise on this journey.

1. Introduction

This work aims to study Internet of Things (IoT) and explain their importance, especially in the field of economic development and their increasing significance in the coming years and decades, as well as the crucial role they will play in the development of future businesses. Due to the fact that the future of many businesses will depend on their relationship with AI and IoT, their investments in the development of these technologies, and their undeniable importance, these were the main reas1.ons for choosing these two areas of study. With this research, I intend to explore how these technologies can assist businesses, companies, and various institutions in developing their products, services, and operations. The purpose is to understand the potential opportunities and challenges related to their implementation and to comprehend the general concerns of employees and policymakers regarding these advancements [1]. Businesses have always tried to find practical and intelligent ways to reach consumers or service seekers, adapting their products and services to the market's demands and current trends. This work aims to explain the new and latest approaches to this issue, to present the current and potential future scenarios, and to demonstrate how the use of Artificial Intelligence and the integration of the Internet of Things can support and facilitate such endeavors [2]. The fact that information, which is often private, is now easily and freely distributed without external influence leads us to contemplate how the same information can be used to directly access goods and services by consumers. I believe this is the future for all businesses, and the sooner they adopt such technology, the greater their growth and impact in the markets they aim to thrive in. This direction is justified by the new circumstances that have arisen, especially in the past five years, during which information technology has rapidly developed, accompanied by an enormous and almost simultaneous distribution of comprehensive data and information [3]. This enables access to various services and the expansion of businesses

in markets and services that were once considered unattainable. This issue is constantly evolving, and there is no perfect solution, as it involves ongoing development activities. However, with the intervention of Artificial Intelligence, research methods, data collection, and the utilization of the Internet of Things, this activity will not only rise to much higher levels but also disrupt traditional business practices as we know them today. Their implementation will enable a more accurate determination of market demands and consumer targeting, as well as the provision of services based on specific market requirements.

But the question arises as to how this can be achieved. Through the use of Artificial Intelligence, we can obtain concrete information about market needs, as the use of social networks has now reached enormous proportions, and the data users provide through these networks, consciously or unconsciously, is invaluable compared to any traditional market research data collected until now. By utilizing various methods of digital information dissemination, along with the use of Artificial Intelligence and the Internet of Things, businesses will be able to offer their services almost immediately, in line with consumers' demands, and adapt to immediate and specific requirements. To accomplish this work, it was necessary to gather information to explain these two technologies or fields of study, and then collect specific data from two case studies: the United States and the European Union (EU), which have highlighted numerous advantages and opportunities, as well as obstacles to the implementation of these technologies [4-5].

The methodology used in the analysis and research is primarily qualitative, based on theoretical foundations, considering concrete information derived from researchers and official economic publications related to AI and IoT. However, this research also includes quantitative methodology with practical, numerical, comparative data, as well as information obtained from surveys. If policymakers and businesses find the right way to connect the physical and digital worlds by 2025, it could generate up to $11.1 trillion in annual economic value. The Internet of Things (IoT) or Internet of Everything (sensors and actuators connected through computer systems) has received tremendous attention in the last five years. The latest report from McKinsey Global Institute, "The Internet of Things (IoT) - mapping the value beyond the hype," seeks to accurately conclude how IoT technology can create real economic value. Our finding is that the value beyond the hype in this case may even underestimate the full potential. Therefore, it is essential to understand where true value can be created and make successful efforts to address various system issues, including interactions among informative systems. To have a broader picture of the potential benefits of IoT technology and the challenges in the global economy, we have analyzed over 150 use cases, ranging from individuals using health and wellness monitoring devices to manufacturers using sensors to improve equipment maintenance and ensure worker safety.

The analysis (from bottom to top) for the applications we measure estimates that the Internet of Things technology has an economic potential impact ranging from $3.9 trillion to $11.1 trillion annually by 2025. If we consider the maximum values, including the positive consumer balance, it would be equivalent to about 11% of the world economy, as shown in (Figure 1).

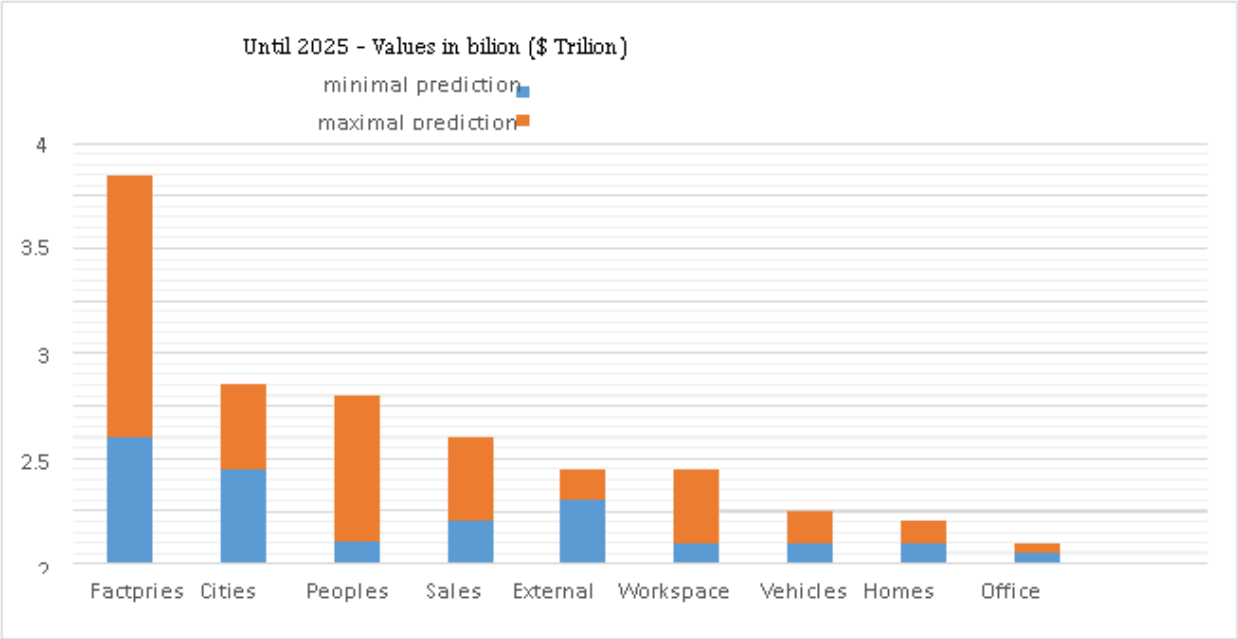

Figure 1. Potential benefits of Internet of Things technology.

Achieving such an impact requires specific conditions, overcoming technical, organizational, and regulatory barriers. In particular, companies that use Internet of Things (IoT) technology will play a key role in developing appropriate systems and processes to achieve their maximum value. Among our findings are:

- Interoperability between IoT systems is essential. Out of the total potential economic value that IoT enables, system interoperability is required for an average of 40% or close to 60% in some presented fields.
- Currently, the majority of IoT data is not utilized. For example, in an oil device with 30,000 sensors, only 1% of the data is examined. This is because this information is usually used for anomaly detection and control, not for improvement or prediction – where its greatest value lies.
- Business-to-business applications will benefit more from the value (about 70%) than consumer usage, even though consumer applications, such as health or fitness monitoring and self-driving cars, attract more attention and also create significant value.
- IoT has broad potential in developing economies. Again, we estimate that it will have a higher value impact in advanced economies due to higher usage value. However, upper-middle-income economies can generate around 40% of the value of IoT and about 50% in some areas.
- Consumers will reap most of the benefits. We estimate that users of IoT technology (businesses, organizations, and consumers) can capture 90% of the value generated by IoT applications. For example, by 2025, remote monitoring can create $1.1 billion annually by improving the health of patients with chronic diseases.
- A dynamic industry is evolving around IoT technology. As in other technological waves, both established players and new entrants have their opportunities. Digitization blurs boundaries between technology companies and other types of businesses; for instance, industrial machinery manufacturers are creating new business models using IoT devices and data to offer their products as services.

2. Problem statement and methodology

AI and IoT, as two key factors in the digitization of businesses, play a fundamental role in the digital transformation of businesses and the evolution and creation of various business models. As such, they have played a crucial role in my engagement with this research, with an open approach to the information extracted, the interest of businesses, and their perception of the impact of AI and IoT on their businesses, as well as potential benefits. The impact of IoT in this context is expected to increase in the near future, leading the majority of businesses to implement them in order to adapt to the digital environment primarily enabled by AI and largely facilitated by IoT, Businesses need to understand all the attributes of AI and IoT in order to find real and possible opportunities for their application, aiming to maximize the development capacities of businesses. Otherwise, businesses may encounter issues in delivering qualitative products and services, problems regarding speed, reliability, flexibility, etc. Consequently, businesses may lose their competitive edge and may not have the opportunity for further development [6-8].

2.1. Methodology

This work aimed to analyse the economic impact of Artificial Intelligence (AI) and the Internet of Things (IoT) on existing businesses and their potential influence in the future, including not only the businesses currently operating and utilizing AI and IoT systems but also future businesses aiming to incorporate AI and IoT into their operational processes. Regarding the methodology used throughout the analysis and research, it primarily relied on qualitative methods based on theory, taking into account specific information derived from researchers, theorists, as well as official economic publications. However, this research also included quantitative methodology with practical, numerical, comparative data, and information obtained from a questionnaire sent to a narrow group of professional employees [9].

2.2 Initial steps of the research

Firstly, it was necessary to analyze market demands, applicability, acceptability, and the potential positive or negative impact that the implementation of these systems could have, as well as potential risks that may arise during and after implementation. This analysis involved examining how major economies respond to the newly created situation due to significant advancements in AI and IoT, how they plan to invest in these innovations, aiming for further economic development. Additionally, the situation of the United States as an economic superpower, the EU member states as a conglomerate of highly developed economies, and even some G-7 countries were examined. Furthermore, the future of these economies was analysed based on several statistical predictions [10-12].

2.3 Qualitative method - Theoretical approach

The chosen research method largely relied on qualitative methods, primarily based on theoretical studies of a developing phenomenon. A significant portion of the global population is unaware of the inclusion of these

technologies in their work and activities, let alone the extent to which these technologies are already part of daily life and are expected to become even more integrated into their daily tasks in the future. In addition to theoretical studies, this research also relied on concrete case studies, including the analysis of numerical data and predictions derived from analyses of the past 3 to 5 years, all related to these systems and their potential impact on the economy in the future. This demonstrates the combined nature of the research, incorporating both qualitative and direct quantitative methods [13-14].

2.4 Intitative method - Practical approach

Quantitative methods based on observations of concrete results and phenomena or emerging trends resulting from the research were also employed. The research also relied on interviews with a narrow group of professional individuals who possess expertise and higher experience in Artificial Intelligence and the Internet of Things, or whose job nature brings them closer to trends and new digital technologies. These individuals were carefully selected to represent the technology industry, financial institutions, specific manufacturing or service sectors, essentially activities that may be influenced by these factors and technologies in the future. They were interviewed through an anonymous questionnaire, and the nature of the questions was mainly closed-ended or pre-determined. The survey included employees in relevant sectors within organizations, as well as middle and senior-level managers [15-16].

2.5 Interrelated analysis or "Conjoint analysis"

To achieve the desired results, it was necessary to analyse all the notes, theoretical data from various sources, statistical data, etc., in an intertwined manner. As a suitable method to undertake these steps and reach a realistic conclusion with concrete recommendations, Conjoint Analysis was employed. This method yielded valuable information regarding potential consumer interest as well as the interest of potential businesses in these technologies and their future [17].

2.6 Survey - Research samples and population

The survey was conducted using a questionnaire prepared through Google Forms. This online survey format was confidential to ensure efficiency and active participation of respondents. The survey was divided into four parts or sections. The first section consisted of eight personal questions to gather data about the respondents, which will be further explained in this chapter. The remaining three sections were divided into groups of questions regarding IoT. In total, there were 10 questions with four optional answers to provide a clear indication and facilitate data processing. This allowed for the extraction of stable, independent, and highly reliable results, with an exceptionally high response rate compared to the initial number of individuals, businesses, and institutions that were invited to participate in the survey [18-19].

2.7 Surveyed population

The population or type and number of engaged businesses included a wide range of respondents from various industries or activities and roles, with different leadership levels and age groups. The participation was highly successful, with responses received from approximately 73% of those who were sent the questionnaire. The research focused on several categories of the population, with a particular emphasis on employees within organizations or companies with a slightly smaller number of employees. Additionally, data from the respondents indicated an average age range of 30-45 years (Figure 2).

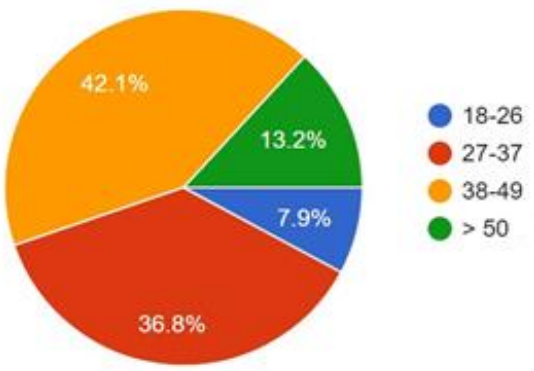

Figure 2. Average age of survey respondents.

The surveyed employees have reported an average work experience ranging from 10 to 20 years (Figure 3). All of this provides additional credibility to the responses received and the results obtained during the research.

The equal gender distribution has also been evaluated as important, including the participation of more than 1/3 of female respondents. Despite the confidential nature of the survey, it was important to obtain responses from female participants. Perhaps the confidential nature of the questionnaire enabled this.

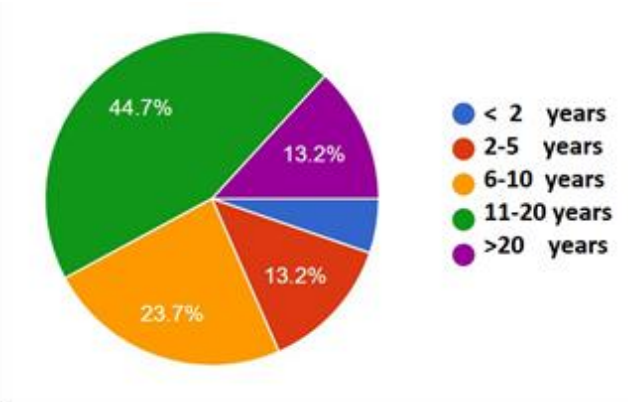

Figure 3. The number of years of employment of the surveyed employees.

The most equal distribution of the sample is observed in the industries included in the survey (Figure 4). Consequently, it has allowed for interpretation and participation in as many industries as possible, even though the survey may have been specific, and only those employed in the information technology industry may have a slightly greater knowledge in this field. Nevertheless, a wide distribution provides reasonable credibility to arrive at reliable results, based on the thinking of the respondents regarding the fundamental question of how future businesses will function compared to the present and what potential impact Artificial Intelligence and the Internet of Things may have on their functioning and eventual development.

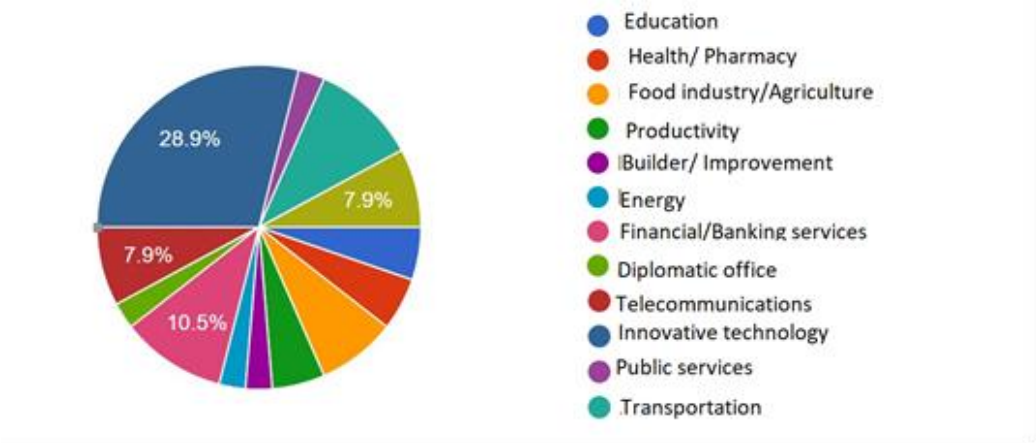

Figure 4. Percentage of industries to which the respondents belong.

The fact that nearly one-third of the respondents belong to the information technology field, I believe, is a consequence of the type and nature of the survey, for which some respondents have decided to delegate its completion to individuals responsible for information technology. Nevertheless, this has been a strategic part of targeting or defining participation.

3. Data analysis

During the literature review, I focused primarily on analyzing two case studies: that of the United States (USA) and the European Union (EU). In the second chapter, I provided brief notes regarding the involvement of relevant institutions in the development of Artificial Intelligence (AI) and the Internet of Things (IoT). I also looked at the steps taken to assist new interested companies in engaging with innovation and promoting AI and IoT, especially concerning the European Union and the short-term plans of the European Commission in this direction. While in the USA, deeper studies have been conducted on the past situation, I examined the current state of digital development in the field of AI and IoT for American companies and how they might evolve in the future. This analysis included the steps that need to be taken, with a particular focus on the direct impact on development, economic benefits, potential job losses, and the creation of new business conditions. I also studied the potential

consequences for employees seeking new job opportunities, the employees' adaptability to new circumstances, the time and resources required for learning new technologies, and the workers' attitudes towards these changes. Particular importance was given to automation and how AI, in collaboration with IoT, can automate jobs, identifying which jobs and employees are most threatened by this development. The research concluded that the threat of job loss decreases with an increase in educational level, with non-graduates being the most threatened (around 44%), followed by those with secondary education (19%) and vocational education (8%). Employees with higher education were less threatened, with university graduates having only a 1% risk and post-graduate education not being part of the threatened workforce. These changes are expected to increase the demand for specific skills, making a significant number of employees more efficient and productive. Studies have varying opinions about the relocation of jobs in the next 20 years, ranging from 9% to 47%, with an average estimate of around 28%. These developments and the impact of AI and IoT have been a cause of concern for those surveyed. The global IoT market is projected to grow from $157 billion in 2016 to $457 billion by the year 2020, with an annual growth rate of 28.5%. Similarly, investments in IoT are expected to reach around $6 trillion from 2015 to 2020, with businesses accounting for $832 billion and consumer spending at $236 billion.

In the European context, institutions are considering ways to support companies, particularly small and medium-sized enterprises (SMEs), which make up about 99% of businesses in the European Union, in adopting AI and IoT technologies. However, compared to other regions, Europe has invested a relatively smaller amount in the development of these technologies (2.4-3.2 billion euros in 2016). There has been no analysis of the expenses related to these digital technologies and the potential benefits in the future. The survey aimed to understand the level of knowledge in these fields and the opinions of respondents regarding the current and future applications of these technologies in their businesses. Information has been requested through the questionnaire regarding respondents' knowledge about usability of AI in the companies or institutions they work for. A slightly smaller number of them have real knowledge about the elements that enable the functioning of IoT. An equal number of them believe that IoT will help in the development of their businesses, while a significant portion of them are unsure [20-22].

Similarly, those who believe that it will be necessary to use IoT in their businesses in the future share almost the same opinion. Interestingly, the majority of the respondents think that IoT will create new circumstances for business and entrepreneurship that they haven't considered before, with 26.3% being unsure or unaware, and none denying it. The final set of questions aimed to summarize the general knowledge about IoT development, the influence of these digital technologies on their organizations, adaptation to potential new circumstances, innovation, new services, as well as the possibility of job risks. The answers are as follows:

There is a genuine skepticism among the respondents regarding how well employees can adapt to new technologies as a result of IoT development. More than half are uncertain or unaware, while 47.4% are positive and claim that adaptability is possible. A large number of them believe that new digital technologies will enable new developments in their businesses. A relatively large number of respondents declare that with the application of technologies like IoT, they can innovate their products and services. 71.1% affirm this, while only 5.3% deny it. The last two questions are very specific and aim to gather responses regarding the perception of how current jobs could be endangered or threatened by technologies like IoT, with a significant number believing that they could, and 18.4% who do not believe that jobs will be threatened by this factor (Table 1).

Furthermore, in the question about the potential replacement of a large portion of current jobs with further development of AI and IoT, we obtain similar results, indicating a potential fear of job loss.

Table 1. Questionnaire responses.

	Yes	No	I'm not sure	I don't know
Do you have information about IoT?	63.2%	21.1%	13.2%	2.5%
Do you have information about the IoT enablers?	57.9%	29.9%	10.5%	1.7%
How much IoT can help business	57.9%	7.9%	26.3%	7.9%
Do you plan to use IoT in your business in the future?	57.9%	0%	23.7%	10.5%
Do you think using IoT in your business will create new business circumstances	73.7%	0%	15.8%	10.5%
Do you think that your employees can adapt to new technologies?	47.4%	2.6%	42.1%	7.9%
Do you think that digital technologies will enable new developments?	65.8%	2.6%	15.8%	15.8%
Do you think that IoT integration can help you implement new products and services?	71.1%	5.2%	15.8%	7.9%
Is there a risk or threat to jobs with the implementation of IoT	63.2%	18.4%	18.4%	0%
Do you think Replace current jobs with IoT technology	68.4%	10.5%	18.4%	2.7%

3.1. Testing of variables and descriptive statistics

Variable testing was conducted using the statistical program SPSS. Comparisons were made between the questions extracted from the questionnaire and the hypotheses, resulting in an analysis of correlations between the independent hypotheses and IoT in relation to business development as the dependent variable (Table 2).

Table 2. Correlations between business development and Internet of Things.

		ZhiB	IoT
ZhiB	Pearson Correlation	1	.654**
	Sig. (2-tailed)		.000
	N	38	38
IoT	Pearson Correlation	.654**	1
	Sig. (2-tailed)	.000	
	N	38	38

**. Correlation is significant at the 0.01 level (2-tailed).

"Descriptive statistics" presents the collected information in a suitable, usable, and understandable form. After gathering the data, descriptive statistics allow us to calculate their frequency, measures of central tendency (such as mean, median, mode), etc., and identify the characteristics in the distribution of results.

Table 3 describes the standard deviation from the average of the responses extracted from the questionnaire for specific variables. For the Business Development variable, the deviation from the mean is 1.13, with an average of 1.982. This means that there is a deviation of ±1.13 from the mean of 1.982. For the Internet of Things variables, there is a deviation of ±1.74 from the mean of 2.386.

Table 3. Descriptive statistics.

	N	Minimum	Maximum	Mean	Std. Deviation
ZhiB	38	1.00	6.00	1.9825	1.13091
IoT	38	1.00	6.00	2.3860	1.74419
Valid N (listwise)	38				

As for the presented hypotheses, the following results were obtained from the respondents' answers:

The respondents confirm the importance of digital technologies in the growth and development of businesses, with percentages ranging from 57.9% to 73.7%, depending on the nature of the question.

It is rejected because 63.2% express familiarity with Internet of Things technology, with 57.9% of them stating that they have knowledge of device connectivity in such a system.

Difficult, with half of them being uncertain or unaware, and only 2.6% denying it. Additionally, 63.2% to 68.4% believe that their jobs will be threatened by these technologies.

The suggested methodology not only enables the identification of potential research needs but also the highlighting of the current state of IoT research. The study has demonstrated that there are other potential uses for IoT designs or applications.

Despite only being considered one topic by the scientific community, it affects practically all commercial sectors.

It also demonstrates that the majority of recent research is focused on IoT ideas in particular fields. The purported potential of the IoT may be limited as a result. Future research should therefore concentrate on developing generic IoT apps and systems that can be used across domains and then extrapolate region-specific ones from those.

Research on how IoT may be used to increase value for businesses also focuses on how it might affect the creation of business models. Strengthening these research efforts in the future could assist companies in innovating their business models, particularly in the production sector where there has been a move from a focus on the product to one on the service. Further study of outside influences on this process, such as advancements in technology, prevailing regulatory norms, or escalating market competition, is also crucial.

The evaluation of these concepts is rare, despite the fact that substantial academic attention is given to the design of IoT concepts, architectures, and applications and their potential impact. As a result, future research should abandon the conceptual phase and concentrate on usable evaluation models. Considering (possible) mediator and moderator variables is another research gap. their results. Future research in this area should, for instance, concentrate on how to boost IoT acceptability and how to address new security and privacy issues. Instead of using a specialized domain-based strategy, future research should take a more general approach to the IoT study sector. Additionally, a larger research emphasis on evaluating already created IoT concepts and applications could contribute to the creation of real-world use cases and hasten the process of IoT influence on various fields, such as the creation of business models.

Additionally, more study on moderator and mediator effects as well as external influence factors has to be done in the future, especially to address the topic of how to boost IoT adoption among various stakeholders [23-24].

This study has a number of limitations despite providing new insights into the business.

1. The instrumentation is the study's initial drawback. This study employed a closed-ended questionnaire with no open-ended items.

First, this study's scope was strictly confined to participant-initiated personal interviews. Due to this, the amount of data that can be acquired in a given amount of time is constrained in terms of length.

2. Data collecting is the second restriction. The state's aggregated data was gathered for this study and made available to the public. In descriptive statistics, this is restricted.

The absence of closed-ended questions, which leads to data that cannot be empirically quantified, is the second constraint.

3. The course was the third restriction. One of the many character development options available in the state is Teen Leadership. Additional research into other programs may provide new insights.

The way that data was gathered is the third restriction. The researcher thinks that all responses, which are all self-reported, are true.

4. Conclusions

Based on the information gathered from the research or literature review, it can be concluded that the development of AI and, consequently, IoT is still in its early stages in terms of representation and potential impact on the global economy. However, there are real indications that developed countries are actively planning or have already invested significant resources in the development of these technologies. A behind-the-scenes competition is taking place between developed and developing countries to take the first steps in this direction. Far-Eastern countries such as Japan, China, Korea, as well as the USA, Canada, and some individual European countries, are competing with each other in innovation and supporting new companies involved in AI and IoT. Discussions are now focused on investments of hundreds of billions of dollars, to be made within a very short period of 2 to 5 years. Unfortunately, developing and underdeveloped countries are likely to lag behind in these developments. Our country (Albania) and our businesses are particularly affected by these trends, which we have tried to understand throughout this research.

Although qualitative theoretical methods were also used as part of the research, the primary focus was on the analysis and quantitative methods, including questionnaire preparation, participant selection, obtaining responses from respondents, and analyzing, examining, and comparing the raised hypotheses, as well as interpreting the results using the SPSS statistical program. The results from the questionnaire and statistical comparisons have been clearly presented in the previous chapters, but a comprehensive description and conclusion of this research also require concrete recommendations.

Developed countries have the opportunity to invest in new technologies even without immediate economic benefits, whereas developing and underdeveloped countries do not have such a luxury as they are still engaged in improving the well-being of their citizens. However, one thing is clear: the technologies of the future are already being developed in the present, and employees need to be prepared now for digital technologies. This is to ensure that the future application of these technologies is not overly challenging. Instead, they should be viewed as part of the new industrial revolution and learned as early as possible, perhaps even earlier than their actual implementation begins. As a country and society, we need to follow these trends because future employees, not too far away, must have basic knowledge of digital technologies, especially Artificial Intelligence and the Internet of Things. Young people need to understand the importance that these technologies will play in their lives and work so that they can easily adapt when the time for implementation comes.

Special subjects should be created to inform students about the latest achievements in these fields and to follow the latest trends emerging from the investments made by developed and some developing countries. If nothing else, and if we cannot innovate ourselves, then we should learn from these developments and try to reproduce the products and services that result from these technologies.

The future will bring many positive changes but also some negative ones, so embracing these changes will only expedite and facilitate the adoption process for all of us, especially for the younger generations. This research, of course, has its limitations due to the small sample size, and in different circumstances, more efforts and participation in the research would have been desirable. Nevertheless, it provides an informative foundation that will certainly assist future research endeavors.

Acknowledgement

We are grateful to the Editorial Staff of the AED 7 symposium that enabled us to participate in this international conference of small and medium business companies that cooperated with us in highlighting the problems and participated in the survey that was conducted through Google Forms [25].

Funding

This research received no external funding.

Author contributions

Besjana Mema: Conceptualization, Methodology, Software, Data curation, Writing-Original draft preparation, Validation. **Fatmir Basholli:** Software, Visualization, Investigation, Writing-Reviewing and Editing.

Conflicts of interest

The authors declare no conflicts of interest.

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