

THE MINISTRY OF EDUCATION OF THE REPUBLIC OF AZERBAIJAN

AZERBAIJAN STATE UNIVERSITY OF ECONOMICS

INTERNATIONAL GRADUATE AND DOCTORATE CENTER

MASTER DISSERTATION

On the topic

**“THE IMPACT OF THE USAGE OF INFORMATION TECHNOLOGIES ON
THE ORGANIZATIONAL STRUCTURE OF ENTERPRISES”**

Mulkishahzada Naila Seyran

BAKU-2020

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**Head of the International Center for
Graduated Education
Assoc. Prof. Dr. Ahmedov Fariz Saleh**
_____ signature
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Code and name of Programme: 060409 Business Administration

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Group: 142

Master’s Student:
Mulkishahzada Naila Seyran
_____ signature

Supervisor: Ph.D. in Econ. Asisst.
Prof. Bayramov Shahin Vagif
_____ signature

Program Manager: Ph.D in Econ.
Shamkhalova Samira Ogtay
_____ signature

Head of the Department: Dr. of Econ.
Prof. Kalbiyev Yashar Atakishi
_____ signature

BAKU – 2020

Elm andı

Mən, Mülkişahzadə Nailə Seyran qızı, and içirəm ki, “The impact of the usage of information technologies on the organizational structure of enterprises” mövzusunda magistr dissertasiyasını elmi əxlaq normalarına və istinad qaydalarına tam riayət etməklə və istifadə etdiyim bütün mənbələri ədəbiyyat siyahısında əks etdirməklə yazmışam.

İNFORMASIYA TEXNOLOGİYALARINDAN İSTİFADƏNİN MÜƏSSİSƏLƏRİN TƏŞKİLATI QURULUŞUNA TƏSİRİ

XÜLASƏ

Tədqiqatın aktualığı: Qloballaşan dünyada proseslərin avtomatlaşdırılması, idarə etmə münasibətlərinin formalaşdırılmasında informasiya texnologiyasının rolu gündən-günə artmaqdadır. Müəssisələr bazarda rəqabətə davam gətirmək üçün texnoloji sferada baş verən yenilikləri izləməli, həm daxili proseslərində, həm də müştərilərə göstərilən xidmətlərdə səmərəliliyi artırmaqda bu yeniliklərdən istifadə etməlidirlər.

Tədqiqatın məqsədi: Bu tədqiqatın məqsədi informasiya texnologiyalarında mövcud tendensiyaları izləmək, onların müəssisələr üzərində təsirini müəyyənləşdirmək və ölkəmizdəki vəziyyəti təhlil etməkdir.

İstifadə olunmuş tədqiqat metodları: Tədqiqat aparılarkən nəzəri hissənin yazılması üçün mövcud ədəbiyyat incələnmiş, tətbiqi hissədə isə müxtəlif internet resurslarından, o cümlədən müsahibə əsasında məlumatlar əldə edilmişdir.

Tədqiqatın informasiya bazası: Tədqiqatda informasiya texnologiyaları və təşkilati quruluş haqqında kitablar, elmi məqalələr, araşdırılan müəssisələrin illik hesabatları, strateji inkişaf planları və Mərkəzi Bankın illik hesabatlarından istifadə edilmişdir.

Tədqiqatın məhdudiyyətləri: Tədqiqatın aparılmasında əsas məhdudiyyət informasiya texnologiyalarının təşkilati quruluş üzərində birbaşa təsirini əks etdirən məlumatların, Azərbaycanda texnologiyalar ilə bağlı kifayət qədər təcrübənin olmaması və onların tətbiqində gecikmələrdir.

Tədqiqatın elmi yeniliyi və praktiki nəticələri: İş zamanı əldə olunan nəticələrdən müasir texnologiyaların seçilməsi və istehsal proseslərinin idarə olunmasında səmərəli istifadə edilməsi məqsədi ilə köhnə və rəqabətə davam olmayan informasiya texnologiyalarından istifadə edən banklar da daxil olmaqla Azərbaycan müəssisələrində istifadə edilə bilər.

Nəticələrin istifadə oluna biləcəyi sahələr: Göstərilən təkliflər təşkilatlarda, o cümlədən, banklarda informasiya texnologiyalarının tətbiqi istiqamətindəki fəaliyyətlərə dəstək olacaq. Bu sahədə olacaq inkişaf da ölkənin qlobal bazarda uğur qazana bilməsinə imkan yaradacaq.

Açar sözlər: informasiya texnologiyaları, təşkilati struktur, bank

THE IMPACT OF THE USAGE OF INFORMATION TECHNOLOGIES ON THE ORGANIZATIONAL STRUCTURE OF ENTERPRISES

SUMMARY

The actuality of the subject: In globalized world the role of information technologies in automation of processes, formation of management relationships is growing day by day. Businesses need to keep abreast of technological developments in order to stay competitive in market and use these innovations to increase efficiency in both internal processes and customer service.

Purpose and tasks of the research: Purpose of study is to follow current trends in information technologies to determine their impact on enterprises and to analyze situation in our country.

Used research methods: During research existing literature for writing theoretical part has been analyzed and in applied part information was obtained from various Internet resources, including interviews.

The information base of the research: In the study have been used books and scientific articles about information technology and organizational structure, annual reports and strategic development plans of researched enterprises and annual reports of Central Bank.

Restrictions of research: Main limitation of the research is lack of data reflecting the direct impact of information technology on organizational structure, insufficient experience in technology in Azerbaijan and delays in their application.

The novelty and practical results of investigation: Obtained results during work can be used in Azerbaijani enterprises including banks using old and non-competitive technologies in order to select modern technologies and use them effectively in process management.

Scientific-practical significance of results: Proposals will support activities of organizations including banks in application of technology. Development in this area will also allow the country to succeed in the global market.

Keywords: information technologies, organizational structure, banking

ABBREVIATIONS

AI	Artificial Intelligence
AR	Augmented Reality
ATM	Automated Teller Machine
BPM	Business Process Management
CAGR	Compound Annual Growth Rate
CIS	Commonwealth of the Independent States
CPG	Consumer Package Goods
CRM	Customer Relationship Management
GDSN	Global Data Synchronisation Network
IaaS	Infrastructure as a Service
IBAN	International Bank Account Number
IMS	Intelligent Management System
IS	Information System
IT	Information technologies
KYC	Know Your Customer
ML	Machine Learning
NFC	Near Field Communication
NLP	Natural Language Processing
OCR	Optical Character Reader
PaaS	Platform as a Service
R&D	Research and Development
RPA	Robotic Process Automation
SaaS	Software as a Service
SME	Small and Medium Enterprises
VR	Virtual Reality

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INTRODUCTION

The relevance of the research topic: In the context of globalization, countries, including different enterprises, must take advantage of existing innovations to strengthen their position in the world market, to play an important role in the economy and to gain a competitive advantage. The most important factor driving these innovations in modern times is information technologies.

Businesses make extensive use of technology to continue their activities. Information technologies in various fields, from planning to control, from decision-making to performance appraisal, provide important advantages in increasing the productivity of the enterprise, reducing costs and providing better quality goods and services to the market, increasing competitiveness. At the same time, technology has led to the development of various, effective management models and increased communication between structures. In addition to supporting decision-making, coordination and oversight, it helps managers and employees analyze matters, solve complicated problems, and create new products. Thus, technologies that are an effective tool in production and management, which allow to process information, which is an important resource today, have an important place on the agenda of enterprises. Although the development in Azerbaijan is not at the desired level, in recent years, enterprises are working to apply technological trends in business.

Level of studying the issue: Since the second half of the last century, there are a limited number of thesis studies and literature about information technologies and effects of them on management. In the early periods, authors such as F. Taylor, G. Mintzberg, J.Woodward, C.Perrow and later authors such as H.Leavitt, L.Whisler, A.Chandler, R. Daft, also conducted research on organization and technology.

Purpose and tasks of the research: The growing role of information technologies today increases the focus on determining its impact on enterprises, what competitive

advantages it brings to enterprises. The main purpose of the study is to analyze the existing innovations in the field of technology, to determine in what forms organizations benefit from it and to study how organizations in Azerbaijan use the opportunities of technology.

Object and subject of research: The object of the dissertation is the large multi-national companies and existing banks in Azerbaijan. The subject of the work is to study the level of use of information technologies in these enterprises.

Research methods: In this thesis, research has been conducted based on data collection method, statistical methodologies, observation method and interview methods. When writing the dissertation have been used both quantitative and qualitative methods. Both quantitative and qualitative analysis provided more information in the research process.

Research database: The main database of the dissertation is information obtained from articles published in previous years, books, legislative acts of Azerbaijan, periodicals of the Central Bank and other commercial banks.

Research limitations: The main difficulty in the study is the lack of sufficient information, the inability of enterprises to properly analyze and disclose information on this issue.

Scientific novelty of the research: The results of the study are important because there is no extensive research on the impact of information technologies on organizations, especially how they are used in Azerbaijani banks. The results obtained in the course of work can be used at Azerbaijani enterprises, including banks using outdated and uncompetitive information technologies, with the aim of choosing modern technologies and their effective use in the management of processes.

Scientific and practical significance of the results: The scientific significance of the work lies in the fact that the developed scientific and methodological recommendations for improving the efficiency of using information technologies in the management of internal processes and relationship with partners are brought up to

specific recommendations, the implementation of which will improve the enterprise management processes.

CHAPTER I. THE ROLE OF INFORMATION TECHNOLOGIES IN MODERN ORGANIZATIONS

1.1. Definition and importance of information technologies in modern world

Modern technologies of today world are advancing with incredible speed and are rapidly spreading around the world. Especially in developed countries, classical technologies are rapidly replaced by high technologies. According to a definition, high technology refers to the most advanced systems and tools in the modern world. In other word, high technology is the application art of complex systems equipped with various automated devices and computers. New technologies related to telecommunications have enabled the development of information technologies. New materials, which are advanced technology products, make industrial products cheaper, durable and lighter. In parallel with the change in computer technologies, advances in the software field and the strengthening of the communication infrastructure triggered the dizzying development in the field of information technologies (Karagül.S and Özkan M.F., 2015).

Information technologies (IT) - a set of methods, software and hardware combined into a technological chain that provides for the collection, processing, storage, distribution and display of information in order to reduce the complexity of the processes of using information resources, as well as increase their reliability and efficiency (Юрьевич А., 2018). IT is not limited to installing computer systems and configuring software. IT, with a current view, consist of many components such as computer hardware, software, computer networks, communication technologies, human power trained in this field, procedures, internet, intranet and other communication tools.

Development process of information technologies has happened in parallel with the industrial revolution and this process took too long. The revolutions of technology are shown in the table below:

Table 1: The change in technological patterns followed by a sharp jump in productivity and economic growth

Technological Revolution	Period	Innovations/breaks	Result
1st technological revolution	End of XVIII – Beginning of XIX century	Steam and water engines, mechanical devices, metallurgy, looms, transport	Development of transportation, transition from agrarian economy to industrial economy
2nd technological revolution	2 nd half of XIX – Beginning of XX century	Electric energy, stainless steel, chemical and oil industry, telegraph, telephone	Continuous production, division of labor, electrification, railways
3rd technological revolution	The end of XX (from 1970)	Digitalization, application of the production of information and communication technologies (ICT) and software, development of electronics	Robotics and automation
4th technological revolution	The term was introduced in 2011 as part of the state I-Tech strategy of Germany (one of ten projects is industry 4.0)	Global industrial networks, the transition to renewable energy sources, the transition from metallurgy to composite materials, biotechnology, Internet of things, artificial intelligence, 3D printers, food synthesis, vertical farms, gene modification, self-driving transport, neural networks	Distributed production, network collective access and consumption, distributed energy, sharing economy, replacement of intermediaries with distributed networks, direct producer access to consumer

Source: Баранова А., (2016), “На пороге революции. Четвёртой промышленной”, Редакционные статьи, с.2.

Nowadays it is almost impossible to describe the modern world without information technologies. In the first revolution, the individual engineer, mechanic and master craftsman came to the fore as the dominant innovative force. During the second revolution, the mechanic and master craftsman were deleted from the innovation process, sharing this area with the research and development departments of individual scientists and engineers. In the third revolution, the team of scientists and engineers which working together in professionalized R&D departments, was replaced by the individual scientist or engineer. Likewise, the most sought after skills in the process of

innovation have shifted from industrial crafts in the first period to research degrees and research experience in the physics and engineering sciences in the second period. In the third period, electronics, computer science and computing, molecular biology and genetics, system engineering and system analysis were replaced instead. New technologies, which are at the heart of the third revolution, cause many developments and continue to radically change the modern world view (Баранова А., 2016).

Technology is shortening distance is its biggest gift to the modern society. News, information and pictures are more mobile and has become more globally available. Television, smartphones and other technological developments make the world smaller and more different. Now the global information technologies industry is worth about \$5.2 trillion. The distribution of this amount by region is as follows: 32% of this amount belongs to the United States, 20% to Western Europe, 14% to South-East Asia and the rest to other regions (https://comptiacdn.azureedge.net/webcontent/docs/default-source/research-reports/comptia-it-industry-outlook-2020.pdf?sfvrsn=8869ad68_0).

One of the main impacts of technologies on society is economic effect. Economic consequences of the effects of technologies on society are as follows (Юрьевич А., 2018):

1. Increase in invested capital: It is necessary to apply them in order to take advantage of the technological trends that change every day and it requires more capital.

2. Increase sensitivity: The tasks required for the new technology should be done more carefully. The precision required for new cars, electrical equipment, electronic devices, semiconductors and computers is increasing every passing day.

3. Need for more skilled workforce: Increasing technology complexity and precision requires higher skilled workers. The workforce is also expected to be more specialized. Chemistry and medical technologies have developed numerous specialized fields.

4. More organization and planning: The increasing complexity of technology requires many supporting functions in addition to the production and operation functions associated with the manufacture and assembly of products. It includes

secondary tasks such as planning, material management, computing, quality control and others.

The importance of technology is gradually increasing in terms of organizations. Rapid advances in science and technology, from supercomputers and superconductors to biotechnology and new materials, emphasized the importance of research and development for organizations. Research and development investments of organizations are increasing rapidly due to their long-term competitive success. R&D investments in most countries have been supported by the government, but this support has been decreasing in recent years. Organizations have become more active in R&D financing and management in the face of declining government support.

Progress in the field of increasing the power and productivity of computer systems, the development of network technologies and data transfer systems, the wide possibilities of integrating computer technology allow to constantly increase the performance of information systems and their functionality (Karagül.S and Özkan M.F., 2015).

The main effective applications of information technologies in business at the present stage are document workflow automation in an electronic office, the creation of telecommunication networks and systems, the development of information systems, databases and knowledge in the financial and economic sphere, in management and marketing, the development of modern management decision support systems.

A market economy creates an opportunity to increase in volume and complexity of tasks solved in the field of production, planning and analysis processes, financial work, relations with suppliers and consumers of products. Thus, operative management is impossible without the organization of a modern automated information system (IS). Today it is impossible to imagine a modern manager without information technologies. There are a large number of software products on the market that automate various mechanisms for making managerial decisions necessary to achieve optimal market parameters for the management object (Chelik A., Kalay F., 2015).

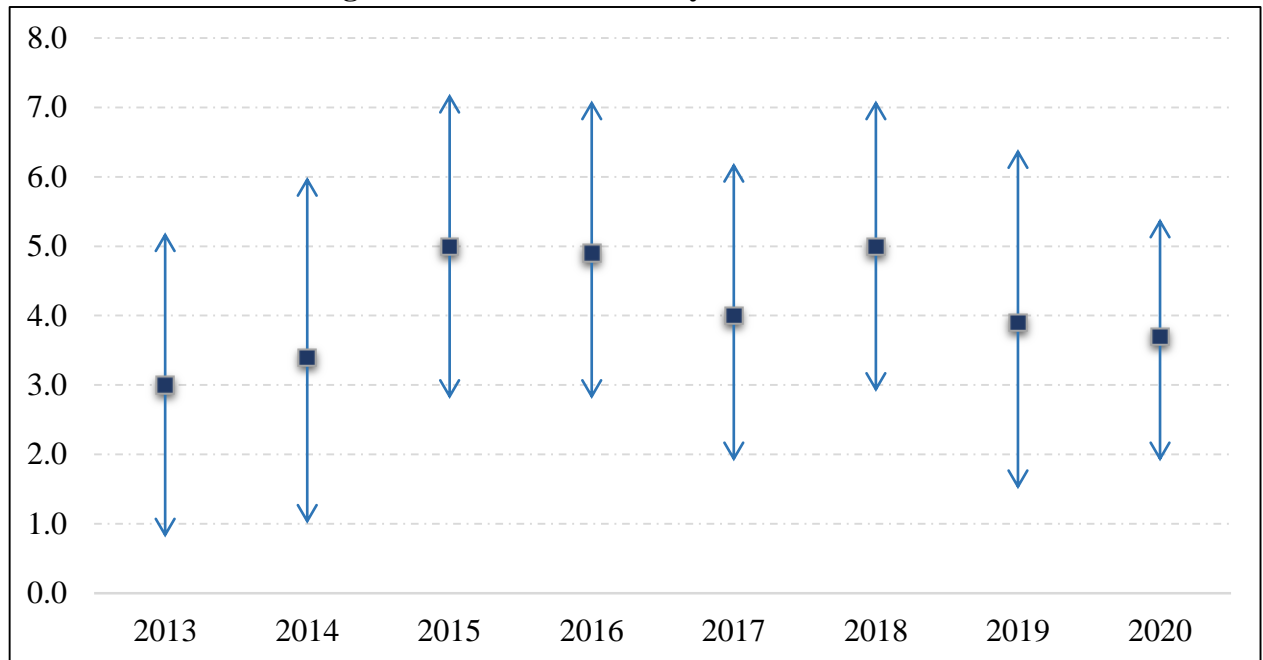
Recently, the importance of technology as a strategic factor has started to be emphasized. As a developing country, China is fighting against the developed countries on technology of the world, such as USA, Japan, Singapore and some European countries. Faced with the competition developed countries have begun to concentrate in areas where they will use their strong technological capacities. Thus, technology makes it possible for developing countries to take part in world trade and economy and it is thought to have the quality to increase the level of welfare in the world.

1.2. Global trends in development of information technologies

Many innovation stimuluses have been moving at incredible speed creating the perfect wave of destruction. Everyone has great potential to do anything. To be successful in the era of digital disruption, first need to find the problem. Then create an approach that changes the way to solve the problem today. Technology is a constantly changing environment and those who want to stay in innovation management must adapt. The consumer journey takes a new route, as well as customers and companies embrace emerging technologies. As IT industry trends become more common, in the world will be searched brands that can operate with accuracy and real-time efficiency. To meet the demands of consumers businesses and solution providers should also address the latest trends and possibilities provided by the emerging innovations to realize their full potential. A revolutionary breakthrough in the field of supply and labor productivity, improving the efficiency of logistics and global networks.

Last years IT industry has demonstrated growth and based on last 7 years data forecasts have been prepared for 2020. As we see from the table below the optimistic end of forecast is 5.4% and pessimistic end of forecast is 1.9%. Total predictions show the global information technologies industry will grow at a rate of 3.7% in 2020.

Figure 1: Global IT industry Growth Forecast for 2020



Source: <https://www.comptia.org/content/research/it-industry-trends-analysis>, (24.09.2019)

In the past few years, technology has had a particularly significant impact on financial services. Businesses are obliged to abandon traditional financial practices and follow agile, innovative approaches to stay ahead of the competition. 2020 and beyond will see transformational changes in how technologies affect businesses. As businesses will use FinTech (Financial Technologies) to create new business models, innovation driven by technology in products and services will continue at full speed. This is clear from the fact that the FinTech market is constantly growing. According to a report, it's value was \$ 127.66 billion in 2018 and is expected to reach \$ 309.98 billion by 2022 (<https://www.prnewswire.com/news-releases/global-fintech-market-value-is-expected-to-reach-309-98-billion-at-a-cagr-of-24-8-through-2022--300926069.html>, 30.09.2019). Another report states that the worldwide adoption rate of FinTech grew about 64% in the first three quarters of 2019 (www.ey.com/en_sa/financial-services/eight-ways-fintech-adoption-remains-on-the-rise, 30.09.2019).

Main trend technologies of modern time have been discussed below. These trends in financial service fields can help banking, insurance and other institutions enforce security, increase accessibility, provide convenience, and especially, build trust.

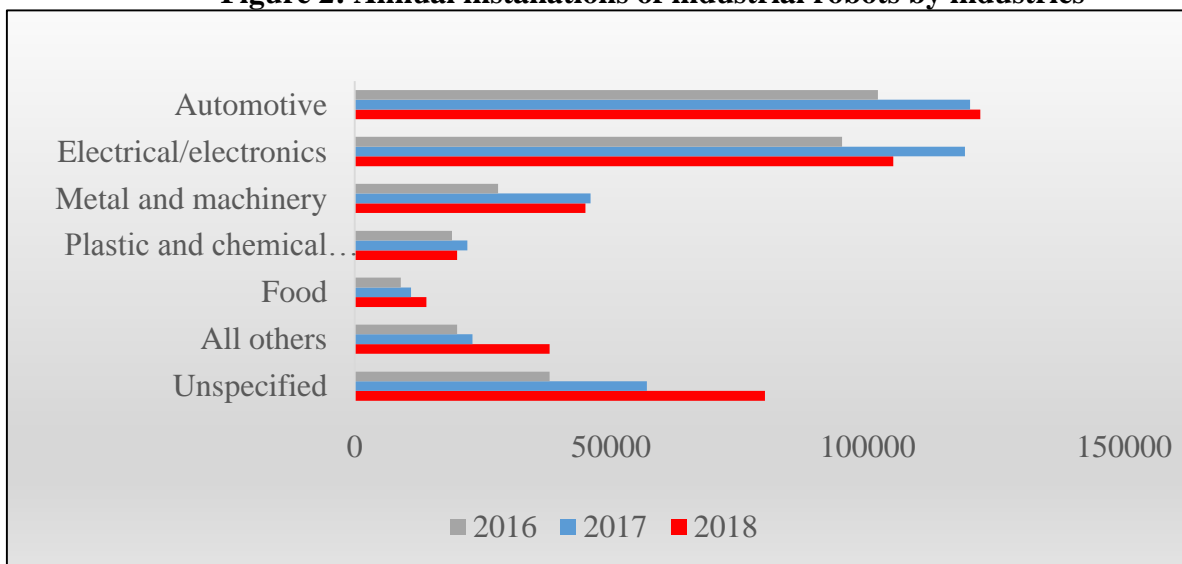
Cognitive technologies. In our time, it is possible to automate tasks which require cognitive skills such as handwriting or face recognition, as well as cognitive skills such as planning, incomplete or indeterminate information, and learning. Technologies that have been able to do such work known as cognitive technologies, which are supposed to require human intelligence (<https://www2.deloitte.com/us/en/insights/deloitte-review/issue-16/cognitive-technologies-business-applications.html>, 30.09.2019).

Main concept of cognitive technologies consists of followings (deloitte.com/content/dam/Deloitte/tr/Documents/technology-media-telecommunications/Cognitive-Technologies.pdf, 30.09.2019):

- Computer vision: The capability of computers to recognize things, accidents and activities in unlimited (i.e. naturalist) visual environments;
- Natural language processing (NLP): The capability of computers to work by text, for example, is to extract significance from text or to create a legible, naturally in style and correctly in grammar text;
- Machine learning: The capability of computer systems to upgrade their capacity with the impact of data without the necessity to follow up distinctly programmed directives;
- Speech recognition: The capability to adapt exactly and automatically human speech;
- Scheduling and planning: The capability to automatically find an order of actions to meet objectives and monitor limits;
- Optimization: The capability to automate complicated decisions and compromises about constricted resources;
- Rules based systems: The capability to use databases to automate a process of getting result about data;

- **Robotics:** It is branch of engineering covers the conception, design, manufacture and operation of robots. Over the past decade, a robotics revolution has surprised all over the world. As their capabilities expand, so does increasingly the rate of purchase and installation of these intelligent machines in industry. Since 2010, the number of industrial robots has increased more than doubled and adoption of them in service sector professions over the next 5 years. We can see the units of robots by industries for 3 years in figure 2 and 74% of these global robot installations are concentrated in five countries: Japan, China, the United States, the Republic of Korea and Germany (ifr.org/downloads/press2018/Executive%20Summary%20WR%202019%20Industrial%20Robots.pdf, 02.10.2019).

Figure 2: Annual installations of industrial robots by industries



Source: <https://ifr.org/downloads/press2018/Executive%20Summary%20WR%202019%20Industrial%20Robots.pdf>, (02.10.2019)

Conversational Chatbots. Chatbot is a computer program designed to simulate talking to human users over the internet. The chat robot, which is an automatic communication system; it is an assistant that enables businesses to be closer to their customers by integrating instant messaging. The enormous speed of these robots helps to gain customer loyalty. Online chatbot technology saves time and energy by automating the work of the customer support department. In 2020, it is estimated that

over 85% of customer interactions will be handled without human beings (gartner.com/en/documents/3913698/the-customer-centric-infrastructure-organization, 05.10.2019). These chat robots do not only answer customers' questions; it gathers information about users, organizes meetings, and reduces overheads of companies.

Chatbots can be divided into two groups, depending on how they are programmed: simple and smart ones. Simple robots work according to preset keywords. Commands should be written separately using regular expressions and analysis. If the user does not use keywords, the robot cannot understand this. These robots are generally suitable for sites where same type questions are asked. E-commerce sites where frequently and same questions such as when delivery is made, what is the shipping fee are suitable for this type of robots. Smart robots get support from artificial intelligence when answering the user. Instead of the previously prepared commands, the suggestions of robot are evaluated. Also, all the words people say are recorded for further processing and artificial intelligence continues to improve itself for the next chat. The learning in question is slow and should be improved.

The most important benefits of using chat robots can be (Brandtzaeg P.B. and Følstad A., 2017):

- Productivity: These robots access information quickly and efficiently, help users more easily;
- Entertainment: Users have fun with funny tips from these robots;
- Curiosity: This innovation arouses curiosity in humans. People want to discover and try out innovations.

Entrepreneurs and brands are increasingly including chat robots in customer relationships. These robots help daily operation, sales process and customer relations. The robots that make shopping easier improve the customer experience and increase the chances of the user to visit the same site again. Instead of displaying a long list of information, the chat robot responds directly to the client's question, saving people time. The customer, who feels more special, also wants to buy (Brandtzaeg P.B. and Følstad A.,

2017). Answering user questions rate of businesses on Facebook are generally low. When a chat robot designed to answer every question is used, the response rate of businesses reaches 100%, which is a positive feedback that gives confidence to users who visit the business page. When chat robots are automated, the burden of the customer relationship department is reduced.

Blockchain. Blockchain, consisting of blocks, is a distributed database system that provides encrypted transaction tracking. In money transfers, each step creates a block. For example, each of the information such as the sender's name, sent amount is a block. These blocks created during the transfer process are encrypted, never changed and made unbreakable. These blocks are distributed to everyone on the entire network, and everyone has the same encrypted information. The principle of being decentralized of blockchain is based on this technology. The information on the block can only be processed by the buyer and seller specified on them. In addition, blockchain technology is transparent, anyone can review the accumulated blocks so far (<http://www.duzce.edu.tr/yonetim-bilisim-sistemleri/sayfa/10332/blockchain-nedir->, 07.10.2019).

Blockchain technology provides individual users with unprecedented control over digital identity, so blockchain, a global open account book, is used not only in the production of cryptocurrencies, but also in many different areas such as storage and management. The opportunity it provides for digital identity makes it the key to the economy of trust. In this respect, blockchain is not only limited to the financial sector, but the opportunities offered by digital technology are transformed into opportunities by businesses. In this respect, it is suggested that blockchain technology is at the center of the fourth industrial revolution. In fact, the great effect of technology in our life in the coming period will not be realized with social media, big data, robots or artificial intelligence, the real revolution is the blockchain that forms the basis of virtual-digital money. Important steps are taken with blockchain technology that enable different sectors to be integrated with technology (<https://www.researchgate.net/publication/->

333545589_A_TenStep_Decision_Path_to_Determine_When_to_Use_Blockchain_Technologies, 07.10.2019).

- Utilizing the opportunities offered by digital technology to facilitate international trade, the technology giant IBM has attempted to establish a digital trade chain consortium through blockchain technology with organizations located among the largest banks in Europe;

- Maersk Line, one of the world's largest maritime operators, started to use the blockchain infrastructure by strategic cooperation with IBM in order to save time and cost in the operation of ships and cargo (containers) operating in international waters, to speed up the process and to get rid of the procedure of documents;

- Companies such as Walmart, Unilever, Nestle, Dole, Kroger, the world's largest food giants, have also agreed with IBM to monitor the supply chain for food safety with blockchain technology;

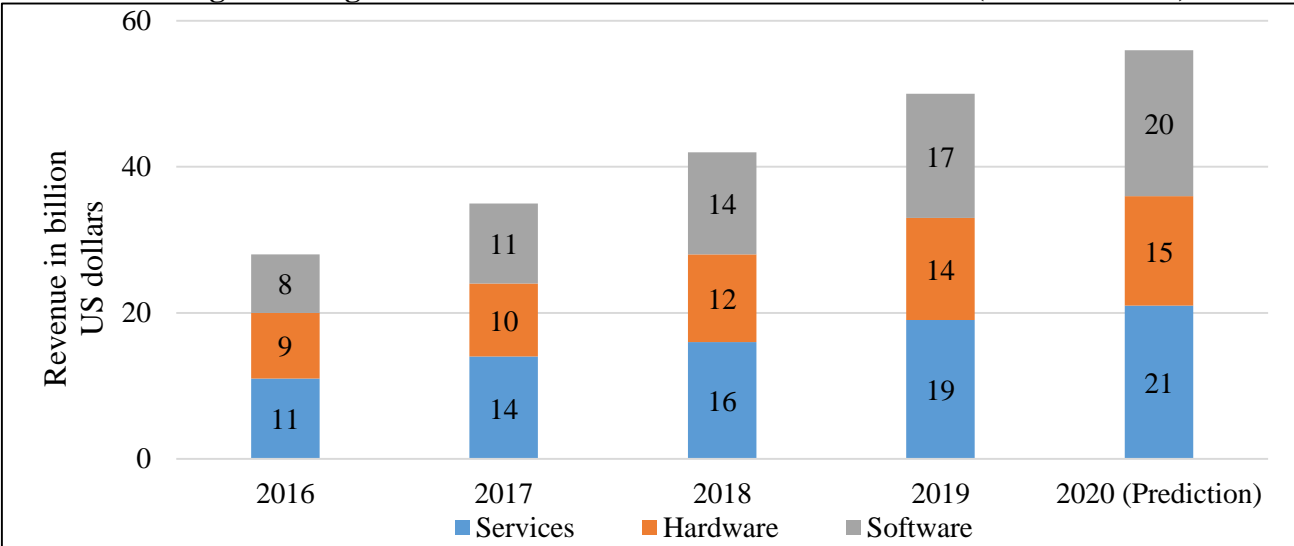
- Sweden has taken steps to carry out the storage and management of land registry records with blockchain.

In summary, the output of digitalization, the opportunities brought by blockchain technology, facilitate our lives in different sectors and fields such as finance, healthcare, science, industry and change the way we do business.

Data analytics. In modern world data has significant role for any organization. Especially, to operate in Big Data age requires working with data professionally. With data analysis, useful information should be discovered, the useless ones should be cleared and what should be done and what should not be done in the next process. This is a transformation process. Data analysis should be done in all business lines. However, of course, the analysis of each sector will not be equal. Different organizations serving in different sectors should perform their analysis by using different techniques and taking different approaches. As this is necessary for a giant brand, it is an important process even for a small blog broadcasting on the Internet.

The importance of Big Data or Data analytics can be seen from the following table. The revenue getting with the help of appliance of Data analytics shows significance of it in our time and for the future. Comparing the global demand for advanced analytics and Big Data-related hardware, services and software, dominance of the last category becomes clear. The software segment is projected to increase the fastest of all categories, increasing from \$8 billion in 2016 to \$20 billion in 2020 attaining a Compound Annual Growth Rate (CAGR) of 20%.

Figure 3: Big Data revenue Worldwide from 2016 to 2020 (in billion USD)



Source: <https://www.forbes.com/sites/louiscolombus/2018/05/23/10-charts-that-will-change-your-perspective-of-big-datas-growth/#5330fd492926>, (08.10.2019)

Before performing data analysis, it is necessary to ensure data integration. When the integration is smooth, the data of firm flows regularly and the relevant department can analyze it. Companies only have data analysts who are employed to achieve this. Firstly, raw data is obtained by integrating before the analysis. This raw data is translated into useful information by expert analysts in the business. Different hypotheses are tested, some theories are rejected and plans can be changed (https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Big%20data%20The%20next%20frontier%20for%20innovation/MGI_big_data_exec_

summary.ashx, 08.10.2019). The data, which can be evaluated numerically or category-based, is selected based on customers' habits, wishes and practices.

Automation. When talking about automation, efficiency, speed and precision are remembered. Due to the high technology and competitive environment, factories and manufacturers want to do their jobs more accurately, efficiently and quickly. Therefore, although human power is necessary, it is now an obligation to go to automation. In this case, automation systems came to the fore. Automation systems consist of multiple systems and tools. The automation system can consist of many machines, from simple devices to complex equipment and developed robots.

However, automation can also be done by appropriately sharing between man and machine. In this regard, there are degrees of automation. If an automation system uses human power intensely is semi automation and is called full automation if it uses machine power intensively.

With the progress of time, the environment of competition has increased in the field of automation. This led companies that manufacture automation systems to start producing faster and more flexible systems to suit everyone. As a result, automation companies started to produce automates with many advantages for their customers. We can list the advantages of automation as follows (Onnasch L., 2015):

1. In companies producing using automation system, since there is no such thing as human error, the error rate is very low and thus the quality of the produced product is high;
2. Automation systems can produce high numbers in a very short period of time, as it works continuously and fast. In fact, a worker can do the work of a single machine in a day, maybe in a week. It saves time;
3. While producing with the automation system, work accidents are noticeably reduced;
4. In long-term works, the automation system completes production with a lower cost than production with manpower;

5. A production company that works automatically and error-free is chosen more than other companies. This enables the company to stand out more than others in a competitive environment.

According to research reports, technology such as robotic process automation (RPA) can help financial businesses save up to about 25-30% (Anagnoste S., 2018). Technology helps financial service providers automate repetitive and data intensive tasks. It helps to improve process accuracy and task execution. RPA will be used to greatly reduce manual dependency and increase efficiency in the financial sectors.

Cloud computing. Cloud computing is the general name for internet-based computing services. These services provide computer resources that can be used at any time and shared among users for computers and other devices. It is the general name of the system where users can access from anywhere with internet. Cloud computing has multiple benefits. A few of these are:

- Privacy;
- Cost savings by reducing capital infrastructure;
- Instant update;
- Saving license costs.

There are 3 service models in appliance of cloud computing. Infrastructure as a service (IaaS): In this most basic cloud service model, cloud providers offer servers as physical or virtual machines. Platform as a service (PaaS): In this cloud model, the user uses their applications that are compatible on a specific platform (python, java, .net etc.) by taking advantage of a rich environment. Software as a service (SaaS): In this cloud model, users are given the opportunity to run pre-determined applications directly from the web browser (Srinivas J. and others, 2012).

There are public, private and hybrid types of cloud computing used. Public Cloud: in public cloud applications, storage and other resource access is provided to users by service providers. These services are free or priced according to usage. Generally, public cloud providers such as Microsoft and Google process their infrastructure

resources and access only over the internet. Private Cloud: Private cloud is a type of cloud technology preferred by larger companies and companies whose information is more important. As an example, can be shown Hyper-V and System Center products offered by Microsoft. As private cloud is a personally established structure, all information is at our disposal. For example, government agencies can provide their computing needs using a shared cloud. Or an international company can maintain the computing needs of its branches in all countries over a single cloud. Hybrid Cloud: These are the structures that emerge from the combination of Public and Private Cloud. Private Cloud technology is used where security and privacy are more important and the measure needs to be kept high, but it is more logical to use Public Cloud in areas where the above security measures can be kept at a lower level. The merger of these changes according to the volume of companies (Srinivas J. and others, 2012).

It seems to offer users unmissable possibilities in this road where technology, internet of things, big data and cloud computing. Thanks to new technologies to be developed in the future, this network is aimed to grow.

Cybersecurity. Cybersecurity is the implementation of measures to protect networks, systems and software applications from digital attacks. Such attacks are usually aimed at gaining access to confidential information, destroying and changing it, at extorting money from users or at disrupting the normal operation of companies. Implementation of effective cybersecurity measures is currently a rather complicated task. Today there are devices much more than people and attackers are being more inventive.

A successful approach to cybersecurity is expressed in the form of multi-level protection covering computers, programs, networks or data that need to be secured (www.acs.org.au/content/dam/acs/acs_publications/ACS_Cybersecurity_Guide.pdf, 10.10.2019). Employees, workflows and technologies must complement each other in organizations to provide effective protection against cyber attacks.

Employees. Users must understand and abide by the basic principles of information security, such as choosing strong passwords, attentiveness to email attachments, backing up data and attentiveness to email attachments. And should to know additional information on the basic principles of cybersecurity.

Processes. The organization should develop a set of basic measures to counter ongoing and successfully carried out attacks. Organization can be guided by one reliable set of measures. This set of measures should explain how to identify attacks, detect and counteract threats, protect systems, restore functionality after an attack.

Technology. Technology is an essential element in providing organizations and individuals with the tools they need to defend against cyber attacks. The main components to be protected are terminal devices (computers, smart devices routers), networks and cloud. The most common technologies used to protect these components include antivirus software, next-generation firewalls, malware protection, DNS filtering and email protection solutions.

In “connected” world of today, advanced cyber defense programs serve the benefits to each user. An attack with a hacked cyber defense can lead to a variety of consequences, from theft of personal information to extortion of money or the loss of valuable data. It all depends on critical infrastructure, such as financial services companies, power plants and hospitals. The protection of these and other organizations is important for maintaining the vital functions of our society.

The use of digital technologies and "cloud" platforms deepens capital, creating digital capital, a part of material capital, which today is becoming the main factor of production and a multiplier which evenly increases productivity. National economies specialize in the production of certain new types of goods and services, increasing efficiency and productivity. Digital technologies lead to qualitative changes in productive forces and structural technological shifts in the economy, increasingly lining up around the long global production value chains, creating high quality and highly qualified jobs. At the same time, the risk of fragmentation of global economy increases

despite economic and technological interdependence, creating an increasingly unstable global environment with a widening gap between developed and developing countries (acs.org.au/content/dam/acs/acs-publications/ACS_Cybersecurity_Guide.pdf, 10.10.2019).

The structure of the global economy is radically changing due to globalization and the technological revolution. Though automation and robotics facilitate many jobs, but replace human knowledge and physical labor in the workplace, destroy social connection and causes serious public dissatisfaction.

1.3. Potential opportunities offered by information technologies and possible threats

Whether it is large or small, almost each business in modern global marketplace uses some kinds of information technologies to improve operational processes. IT solutions help to business save time, create a mobile workforce and use targeted messaging systems to improve customer retention. To keep up with competition from the commercialization of the Internet, companies are increasingly turning to information technologies - software, hardware and telecommunication networks to optimize services and increase productivity (Nikoloski K., 2012). Thus, IT has become an integral part of the business landscape. Although information technologies offer many opportunities for businesses, they can also cause serious risks which has a great negative impact on business activity. These opportunities and threats have been discussed in detail below.

1. Potential opportunities which are provided by information technologies.

To help increase production level and save time. Today businesses more than ever use technology to automate tasks to facilitate data analysis and to store data that can be easily recovered for future use. Optimized workflow systems, shared storage and collaboration workspaces can increase business efficiency and allow workers to handle higher levels of work in a shorter period of time. The technology can also be used to

answer customer questions via e-mail, live chat or via a telephone routing system which connects the customer with an available customer service agent.

Improves communication. Using communication technology tools such as telephones, email, video conferencing or instant messaging programs, can be said that moving information within an organization or business has become immediate. Employees can easily move data between departments without any interruptions. Tools such as e-mail, mobile phones, electronic fax and text messaging improve the transfer of information between structures. They can be used to send business status reports to managers, to inform employees about important business projects and to communicate employees, customers and business partners or suppliers, which provides greater interconnectivity between internal and external stakeholders.

Improves data storage, file management and data reporting. Enterprises use cloud services to store and backup business data. In addition, it saves documents and makes it possible to transfer and access data remotely. Data storage is an advantage only if this data can be effectively used. Progressive companies use this data as part of the strategic planning process, as well as the tactical implementation of this strategy. With services, like Dropbox, business owners can access their data anytime and anywhere. Also, today databases provide greater correlation of information; analysis of this data relationship can contribute to better and more informed decision-making, which will lead to potential growth.

Improves financial management. Accounting software as Bookkeeper, Quick Books, Sage 50 and Account Edge perform different accounting tasks in the business. Business owners can easily balance their books with less accounting experience, because this software is well provided with all the tools required in the field of accounting. It allows to speed up the processing and calculation of financial information, as well as recording or storing financial data that may need to be referenced in the future.

Cuts costs of operation and increases in Return on Investment (ROI).

Communication and social technologies have made it possible to promote the business and launch the product. Many small businesses have found ways to use social technologies to increase their brand awareness and attract more customers at minimal cost. In business, factors such as operating costs play an important role in the development and growth of a business. Therefore, when companies use information technologies to reduce operating costs, their Return on Investment (ROI) will increase, which will lead to business growth (<https://www.idealware.org/measuring-return-investment-technology/>, 12.10.2019).

Economic efficiency. Companies can use information technologies resources to lower their costs. Using IT infrastructure, additional tasks can be centralized in one place. For example, large companies can centralize their payroll function in one place to reduce staff costs. Cost-effectiveness can also be achieved by transferring expensive features to the online environment. Companies may offer email support to customers which cost may be lower than real-time. Economic efficiency can also be achieved with outsourcing options, distant work options and cheaper communication options.

Improves business to consumer relationship. Enterprises and teams use social technologies to interact with their consumers and fans, creating strong business and warm relationships with consumers and it leads to business growth through loyalty and customer expansion. Information technologies can be used to improve customer service with the different ways. For example, businesses can use their website, email or social media accounts to give information to their customers about great agreements and discounts. Informing the customer about these offers may lead to their desire to buy. Good customer service can be used as a great tool for any small business to gain an advantage in a competitive market.

Improves business competitive advantage. The use of information technologies allows companies to maintain a competitive advantage over competitors. Companies which apply information technologies can use them to create new products, distance

their products from the existing market or improve their service. Companies that track a low-cost product strategy can turn to information technologies solutions to reduce their costs by increasing productivity and lowering employee overhead. A business that innovates and implements technology to provide efficient and improve processes usually has a high level of customer loyalty. So, they can constantly meet and exceed the expectations of their customers. Businesses can also integrate information technologies into their products and make it difficult for customers to switch platforms or products.

2. Despite significant advantages, business owners must consider the threats when introducing new IT solutions.

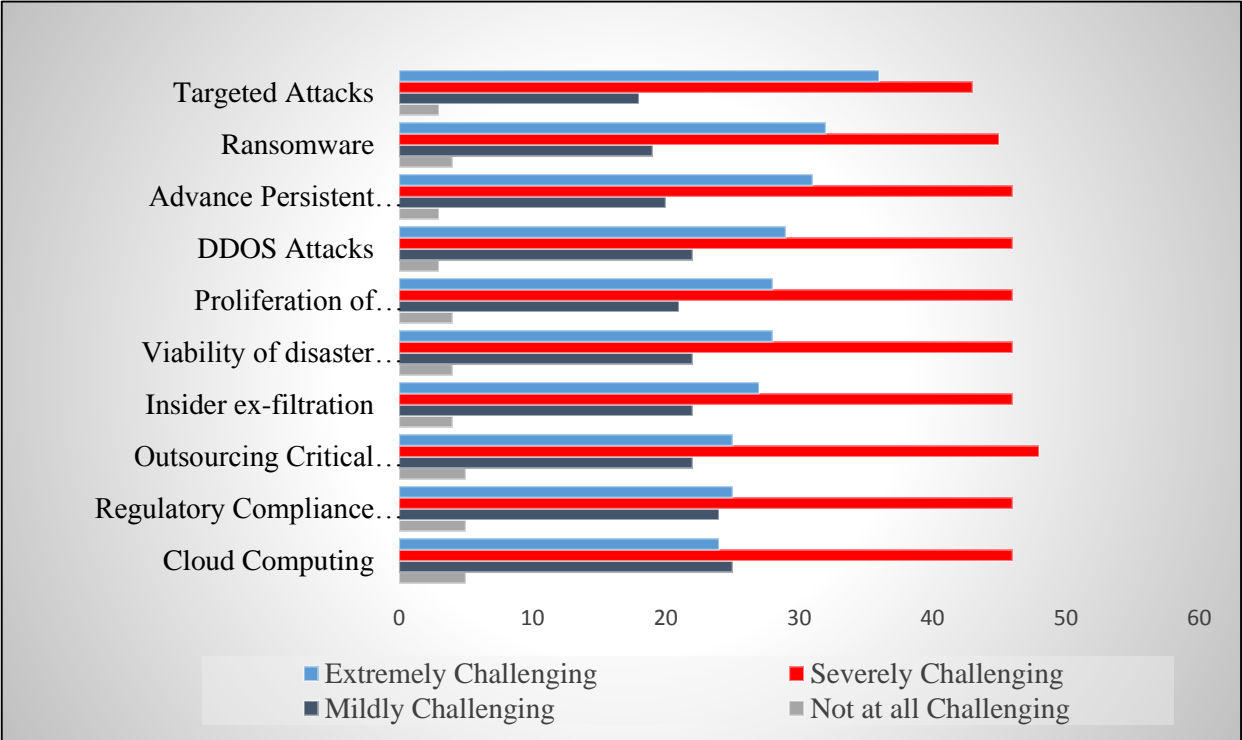
Implementation costs and regulatory compliance. Implementing new solutions takes time and money. As a rule, interrupt the work in business services when new service phases are introduced. Additional training of employees is required and customers may experience a breakdown in the quality of service in the implementation process. Companies typically hire external contractors to implement new hardware and software solutions. Although IT solutions have become more cost-effective as technology advances, companies that make the basic requirements for compliance must comply with all regulatory requirements, otherwise they will risk fines and lawsuits.

Technology security risks. Most of IT solutions are moving to the cloud technologies. The main reason of it that labor has become mobilized. Team members can work together at their home. They can join an online meeting and access client data from smartphones and other mobile devices. This accessibility brings a big risk with itself: data security. Criminals happen with the hacking or stealing of internal and customer data. A cybercriminal can hack a payment system and transfer transactions from real customers to offshore accounts. Customers will never receive products and companies will remain confronted with the emerging problem.

On the Figure 4. Cisco has reported the spread security concerns during 2018. This figure demonstrate the often happened security attacks through their frequency such as

extremely challenging, severely challenging, mildly challenging and not at all challenging. Targeted attacks are leader for the frequency.

Figure 4: Top Security Concerns for SME's 2018



Source: <https://www.cisco.com/c/dam/en/us/products/collateral/security/small-mighty-threat.pdf>, (15.10.2019)

Spyware and personal information. The most common problem is spyware which steals personal information from clients or workers. After getting personal information by hackers is stored and used for fraud operations or identity theft for the financial gain. Employee’s lost or stolen smartphone that contains the access to company programs and data can be simple example for security threat.

Increasing data regulations. Information has a big importance in the modern world. As a result of it, protecting data and ethic use of it have a high priority for lawmakers and regulators. Business owners should not be careless about the protecting customer data. Some industries are more tightly regulated and controlled than others, such as the health and financial services industries. As they collect confidential and sensitive information from customers and patients in their daily business activities. But

it does not mean that other industries are not controlled and they can operate how they want. Every business has to obey to the rules. Customer's private data and credit card information should protect by the business owner.

To gain an advantage with the application of information technologies, it is not enough only use of them. For it, well considered and long-term investment is important. To protect confidential data is required strong security system, access of users should be analyzed, if needed should be limited. And to ensure system security, the business owner should not hesitate to invest in innovative software system (such as advanced antivirus programs). In the work process is important, not information technologies themselves, but rather how use of them affects to achieve organizational objectives.

CHAPTER II. GLOBAL COMPETITION ENVIRONMENT AND ORGANIZATIONAL CHANGE IN ENTERPRISES

2.1. Main characteristics of organizational structure and instruments to improve performance of organization

In the condition of significant changes in the macro and micro environment, the need to optimize costs, the organizational structure of management of any company undergoes substantial changes. Scientifically based improvement of the organizational structure of management is the most important condition for the implementation of strategic goals, cooperation, coordination and control of business processes and resources in the company. Thus, the relevance of the issue lies in the choice of the structure, taking into account the laws of the theory of organization, which in the best way allows the organization to effectively interact with the external environment, efficiently and appropriately distribute and direct the efforts of employees, satisfy customer needs and achieve strategic goals.

The organizational structure of the enterprise is an internal streamlined set of services that manage its activities, relationships and subordination. To better understand the organizational structure, it is important to consider its different types and analyze their characteristics. Organizational structures are classified into 6 groups according to their characteristics. Detailed explanations for each of them is given below (Бородай B.A. and others, 2019):

Linear structure. A linear organizational structure is the simplest structure of all. A linear organizational structure is characterized by the presence of a certain chain of elements subordinate to elements located at a higher level of management. Decisions descend from top to bottom. This type of structure is suitable for small organizations like small manufacturing companies, accounting and law firms. The linear structure makes decisions easy.

Functional structure. This type of organizational structure classifies performers according to the function that they perform in professional life. This type of structure is associated with the need for separation of functions, due to the specifics of the processes and the amount of information related with decision making. Elements of the functional structure are inherent in all types of structures, except for a linear structure. The functional structure provides for the distribution of work in the organization based on the grouping of functions that are performed by the organization - procurement, construction, finance, etc. Each functional group within the organization is vertically integrated. With this type of organizational structure, units are created in accordance with the type of work they perform and are subordinate to functional managers.

Linear-functional structure. Linear-functional structure is a combination of linear and functional structures. Its construction is based on the following mandatory principles:

- firstly, the presence of a common leader and unit heads, who should share their influence on employees in accordance with the tasks assigned to them;
- secondly, the senior manager is obliged to carry out only a linear impact on all employees of the company, and functional managers - technological impact;
- thirdly, any contractor will be able to transfer part of his work to a lower level.

In the linear-functional management structure, decisions are passed along the chain “from top to bottom”, and the head of the lower management is subordinate to the head of a higher level above him, a kind of hierarchy of the leaders of this particular organization is formed. The linear-functional management structure is typical more for such enterprises where there is a steady release of a huge number of homogeneous products. It is effective when there is significant economies of scale. By the type of interaction with the external environment, the types of structures which discussed above are bureaucratic / mechanistic. Bureaucracy (from the French bureau - office and Greek kratos - power) is a management system based on a vertical hierarchy and designed to fulfill its tasks in the most efficient way. They include the definition of clearly defined

goals, objectives, job descriptions, etc. The term “bureaucracy” can also be used in a negative sense to refer to an ineffective, overly formalized management system. The structure of a bureaucratic company can be compared to a pyramid: the majority is at its base, and the minority is at the top. Each person who is part of this vertical hierarchy manages lower-level people and, in turn, is subordinate to higher people, due to which control over the activities of each element of the company is exercised (Бородай В.А. and others, 2019).

Matrix structure. A type of organizational management structure, built on the principle of double subordination of performers, on the one hand, to the direct manager of the functional area of activity, and on the other, the project manager, who is endowed with the necessary authority to manage the project in accordance with the planned terms, resources and quality. As a rule, the matrix structure is characteristic of project activities and is a combination of the linear-functional structure of the company and the functional structure of an independent unit (project). The management structure, built on a functional principle; management, when its system is divided into functional services, each of which has a specific range of work or a project. A combination of control is characteristic of matrix structures, for example, by functions and by projects, the combination of which forms a matrix. The feature of the matrix organization is the dual command system. For this reason, there is a possibility of continuous conflict between project managers and function department managers. The lower-level staff take orders from both managers. Coordination of these two administrations should be ensured. Project-Functional (function) problematic disputes are expected to be resolved among themselves. In case it is not resolved, the authority to take it to a senior manager is given (Eren E., 2009).

The matrix structure is one of the types of structures used in project management. The organizational structure of the project is the most appropriate temporary organizational structure for the project, including all its participants, determining the

conditions for their subordination and interaction, created to successfully achieve the goals of the project.

Divisional organizational structure (product, regional). An organizational form of management in which management combines centralization of strategy, coordination of management and decentralization of medium-term and current decisions. Divisions are represented by the key business units of the organization (corporation), formed as profit centers. The divisional management structure is a set of independent divisions that are part of the organization, spatially distant from each other, having their own sphere of activity, independently solving current and production issues.

Varieties of divisional structures include: divisional-product, divisional-regional, focused on consumer groups. This type of organizational structure is used by large organizations for which functional structures cease to be effective. A divisional structure is such an internal structure of an organization in which smaller entities are created within the functional units (production, sales, etc.), which are no longer distinguished by function, but by type of product, type of customer, or geographical region. At the same time, tasks common to the whole organization — personnel management, legal issues, finances — are assigned to the headquarters structure (the structure of the parent company).

Network structures. Matrix and divisional structures belong to the organic type of structures that provide greater freedom to the heads of departments for making managerial decisions. Organic / adaptive structures also include network management structures. The network management structure characteristic of business associations, which include independent legal entities. The main association in network structures is a franchise agreement, the object of which is a set of benefits consisting of the rights to use the franchisor's brand and business model, as well as other benefits necessary for creating and running a business. A franchise may be a business method, a trademark, a technology with mutual obligations and benefits between the transferring (franchisor) and receiving (franchisee) parties, provided for a fee and executed in accordance with

the law on the protection of intellectual property. Network management structures are used in various fields of activity: hotel business, medicine, trade (Бородай В.А. and others, 2019).

The network management structure arose in the 80s of the last century as part of the general tendencies of flexibility and disintegration. Instead of subordination relations, market relations operate in such a structure; instead of a chain of teams, a chain of contracts and orders for products; instead of a hierarchy, a network of collaborating production units coordinated by market mechanisms. Each member of the network is independent, the relationship between them is voluntary. Obtaining competitive relations is achieved by providing broad entrepreneurial freedom. Network structure is a hybrid solution that combines the advantages of divisional (adaptability) and matrix (single control over the main functions) structures. A prerequisite for the network is a centralized management, centralized functional units on key business issues (Бородай В.А. and others, 2019). The reasons for the emergence of network structures are: globalization of markets, the speed of technological change. The advantages of network structures include: flexibility, lower organization and functioning costs, effective intercompany interaction, freedom and democracy in the choice of relations.

Taking into account the above-mentioned features, each organization selects the type of structure that best suits its areas of activity, applies it in internal management and takes advantage of its opportunities. With this in mind, organizations try to choose the optimal structural form. The properties of the optimal organizational structure are (Осепашвили А.И., 2017):

- Presence in the structure of specialists' groups;
- A small number of leadership levels;
- Small units with highly qualified personnel;
- Orientation of work schedule to consumers;
- Quick response to changes;

- High labor productivity;
- Low costs.

Studies often focus on factors grouped as organizational strategy, environment, technology, size and age of the organization and organizational culture. It is also important to keep in mind that any of the aforementioned factors can influence the organizational structure, depending on the organization, industry and time. Thus, factors affecting the organizational structure are divided into two general groups: external factors (exogenous) formed by the influence of the nearby and far environment; internal factors (endogenous) related to the potential of the organization (age and size of organization, technology, financial conditions, organizational culture, type of production process, location, cultural diversity of employees, qualification of the staff, degree of the employees' integration of organization, management scope and etc.) and strategy which shows the development of the organization. Mintzberg's approach to factors affecting organizational structure is also noteworthy. Thus, these factors can be grouped in 4 general groups (Mintzberg H., 1983):

- *Strategy*. The organizational structure helps management achieve its goals. The objectives are drawn from the strategy of organization. Strategy and structure are intertwined. The structure should follow the strategy. When management decides to make a significant change in the strategy, the organizational structure needs to be modified to support this change. If the tight dependence between the strategy and the structure is taken into consideration, it is possible to say that the companies that implement their strategies with an appropriate structure will be more effective. So at this point, comes to mind the question of which structures are suitable for which strategies. Organizational structures become complex and diversify as the business grows and the competition environment intensifies. Chandler has shown that changes in the organizational strategy lead to changes in the organizational structure (A.Chandler, 1962). He demonstrated that the strategies that started with simple organizations go horizontal integration as the product variety increases and managers need to improve

the structure in order to maintain efficiency. According to the contemporary research thesis on strategy-structure; strategies are now expressed in three strategy dimensions. These are innovative, cost-cutting and counterfeit strategy. The innovative strategy focuses on introducing new products or services to the market. Cost-cutting strategy focuses on tight control of costs, avoiding unnecessary innovation or marketing spending and avoiding price reduction. The counterfeit strategy is the strategy that prefer to enter this product or market after proving that new products or markets can survive. Organizations seek to increase the internal efficiency of the business, with a focus on cost leadership and cost reduction. For this purpose, it aims to improve production technology, increase machine labor and material efficiency in unit time and decrease the share of direct labor and overhead costs per production unit by making changes in operating processes.

- *The size of the organization.* In small organizations, while loose division of labor and individual coordination are sufficient, more division and coordination are required as the organization grows. The management hierarchy is growing first, and then the technological infrastructure. The size of an organization directly influences the number of its structural levels, which can be identified by this relationship – the greater the organizations, the deeper the specialization, the more sophisticated the operations, including a broader hierarchy, and so on (Осепашвили А.И., 2017). Big organizations prefer to have a more specialization of activities, more formal (high degree of formalization) and controlled operations. The size of the organization refers to the number of staff employed. It affects organizational structure. If the organization hires more staff, it will want to take advantage of their expertise. It will increase horizontal differentiation. Grouping the functions together will enable efficiency between the groups, but they will have difficulty in the relationship between the groups as each of them performs separate activities. Management will therefore increase vertical variations to coordinate the units between horizontal variation. This type of growth can also result in field differentiation. Small businesses have very few divisions, few formal

rules and regulations, a limited number of staff members, and a structure where internal control systems are not apparent. The division of labor in large enterprises is advanced, and departments are strictly separated. To a large extent, staff are employed, bureaucratic rules, regulations and internal control systems have been established.

- *Technology*. With a modern approach, technology means a collection of tools to transform inputs into desired outputs and goals. Accordingly, three different meanings are attributed to the concept of technology; physical products and the tools used in their production (machinery, equipment, etc.), processes and activities (production methods including various models, programs, procedures), knowledge used to apply and develop methods, tools and equipment used to produce a specific output (know-how, software program etc.). In this respect, the concept of technology is discussed at three different levels (Бородай В.А. and others, 2019). The first is technology that adapts to the environment. These are tools and methods used in areas such as environmental analysis, R&D studies, market research, statistical quality control, and strategic planning. It is primarily effective in the provision of valid information and data in the development of strategies. The second is the technology used when producing or selling goods and services that the business offers to the environment. Core to these tools that directly affect production called technology. It plays an important role in the implementation of strategies and especially in the success of cost, quality and distribution strategies. The third is technology that supports the production process. Tools and equipment used by accounting, HR and similar units help to make the activities more effective. Innovative organizations are core of today economy. The development of technologies has caused changes on the internal and external conditions, has created rebellious changes in the organizational structure. With the contribution of Internet and IT to the expansion of the global communication infrastructure have been developed new organization forms called “virtual organizations”. The complexity of the technical system and automation of execution are the main parts of effective organizational structure. One obvious solution to the problems of neutral bureaucracy is not less regulation of executive tasks

but more to the point of automating them. Automation seems to humanize a traditional bureaucratic structure which democratization is not able to do (Balıkçı B., 2011).

- *Environment.* It consists of almost everything outside the organization: its geographical location, competitors, customers, the economic, political and even meteorological climate in which organization must operate and so on. Complexity, dynamism, diversity and hostility are specific parts of environment. Current approaches show that structure of organizations have to be more flexible to adapt with no any problem to the changes in the environment. The dynamics of the environmental changes makes opportunities for changes in the structure of organizations, in turn it helps to organizations to become more adoptable and to increase the level of networking between organizations. Environmental certainty or uncertainty varies according to the conditions. Environmental uncertainties cause the managers in decision making situations to have difficulties in obtaining valid and sufficient information and predicting changes in the external environment. Uncertainties cause flexible, horizontally differentiated and segmented organizational structures in the organization. On the contrary, if the environmental conditions are clear, the organization goes to mechanical organization and vertical differentiation. So, the more environment influences the organizational structure, the more complicated it becomes. In the near future, adoption capability to new changeable environments will be one of the basic requirements to provide effective activity of organizations. Thus to choose correct model will be priority for the potential changes in the structure of organization. Other factors are important in the stable environments, but in the dynamic environments there can be changes no matter size, age and technology (Balıkçı B., 2011).

Every organization aims to succeed by increasing efficiency. They use various means to ensure it. These tools have shown a tendency to change over time. In the early days, human labor was used more to ensure this efficiency, but now, in accordance with the requirements of the time, it has been replaced by innovative technologies. Organizations are now taking advantage of technology to compete in the marketplace.

Some of the main tools used for this purpose in recent years in connection with innovation are (www.telegraph.co.uk/business/future-technologies/tools-to-increase-productivity/, 15.11.2019):

- Unified communications - UC combines telecommunication systems with future-proof technology to take advantage of increased flexibility, productivity and effectiveness, enabling employees from anywhere to collaborate with their colleagues and connect with customers.

- Automated back-up systems - It is used to eliminate the disruptions that may be caused by computer crash or virus loss. Automatic backup to a cloud server network without frequent human intervention is a tool used to protect system files and documents.

- Project Management Software - Softwares like Trello and Smartsheet enable messy teams to collaborate effectively and securely and develop project management. The software should allow everyone to access and monitor timelines, manage documents and share screens for smooth operation.

- 24/7 CRM system - It is very important to develop and maintain customer relations. It should allow to adapt the offers to each customer, manage data and measure campaign effectiveness. A good CRM system saves time and makes the organization more efficient.

- Recruitment screening tools - By using artificial intelligence (AI), it helps to eliminate human bias from time-consuming recruitment decisions, making it possible to decide on the best candidate types for new roles and automatically rank by systems based on past hiring.

Thus, in order to establish effective management, enterprises must first choose their goals, and then the appropriate form of organization to achieve these goals. After that, they must carry out management activities with the application of the right technologies, reacting adequately to environmental influences.

2.2. Characteristics of complex strategy based on information technologies and business interests

After the concept of modern organization was introduced, the demands differed both in the enterprises that developed based on the changing economy and the changes in the social field. According to the changing needs and demands of the people, the products and services of the companies, that produce and provide, have increased and differed. Likewise, management types in organizations have differentiated. After considering the human factor, the most important issue to be taken into consideration for the organizations was the information technologies resulting from the developments brought by the era. With information technologies, customer needs have started to change rapidly. The speed of the products produced and the services offered has started to be important. Technology has enabled customers to access products and services through different channels. It has led to the creation of a faster competitive environment and to develop management and organizational models that will enable businesses to comply with these conditions.

Information technologies have an important effect on the redesign of the organizational structure and business processes. These processes are operations for producing products and services, marketing and sales, processing orders and delivering goods and services to consumers, after-sales customer services and relations with them. With information systems, it is possible to obtain advantages such as increasing system efficiency, providing better quality goods and services to customers, minimizing costs, developing new products based on information and increasing competitiveness. In addition, it has become inevitable for companies to use information technologies in all management processes in order to gain competitive advantage. The effectiveness of management functions depends basically on obtaining and using the correct information. For example, in the planning function, it is vital to reach correct information about the future. The effectiveness of the control function will increase with the use of correct information about the actual situation. It is known that decision-

making from the indispensable duties of the manager is also effective with correct information. Again, information is the most important input in all management processes such as employee motivation. Information systems not only increase the effectiveness by being used in the management process, but also bring radical changes in the management activities. The effects of using information technologies in organizations on the change in organizational structure generally take place in the following areas (Mirković V., Lukić J. and Lazarević S., 2019).

Previously, the main task of IT was understood as a function that supports business strategy. However, weak communication between IT managers and business managers hindered the development of a business strategy plan. Thus, the formed strategy focused only on tactical and business needs instead of supporting the business strategy. According to that, investment opportunities were also intended for the short term. It caused problems in creating an effective complex strategy (Smith A., Mckeen D. and Singh S., 2007).

Later, with the development of e-commerce applications, businesses are making their organizational structure able to provide efficiency in this area as well. Previously, the e-business environment of the companies, that only the products, address information and limited communication on websites, have prepared take on the e-commerce structure in which all kinds of products or services can be sold. In this context, companies that use information technologies effectively are expected to continue their e-commerce activities successfully. Facilitating economic transactions with electronic commerce increases the economic functioning intensity. The fact that barriers to interactive relations between businesses, consumers and manufacturers are largely eliminated results in intensification of economic relations at all levels. The fact that jobs can only be completed with data transfer in areas such as financial transactions and software has eliminated geographical limitations. Although geographical limitations do not disappear for other forms of goods and services, the development of

relationship building methods and the widespread and cheapening of transportation services strengthen economic relations day by day.

A new product produced in the enterprise, a newly developed production technique can reach other businesses working in the same sector with each new development in information technologies. Communication previously provided by fax is now made through computer networks, internet and videoconferences. Information obtained can be shared by other users at the same time, and businesses can present their products to the market they decide to enter.

Information technologies affect the structural, technological and cultural dimensions of change at different levels (Balıkcı B., 2011):

Structural change: The proliferation of computer networks has important effects on existing organizational boundaries, divisions and hierarchy itself. Considering its most radical form, the traditional structure of the organization turns into a flexible, responsive and fluid form. In this structure, information technologies will eliminate functional boundaries and create dynamic and self-managing groups. It is observed that modern information technologies systems do not give good results in classical command and control systems. They require the emergence of simple and flexible structures.

In the inter-organizational area, computer networks also weaken the external boundaries significantly. Virtual organizations are in constant communication with both their suppliers and customers and they know the opportunities in rapidly changing markets. Again, information technologies enable real-time coordination of teams working in different organizations.

Technological change: The developments in computer and communication technologies are the most important factor that determines the future of computer networks. These developments range from local area networks to the use of global R&D networks engineers, product managers and marketing experts in coordination for product development in multinational companies. The use of email, electronic data

exchange, video conferencing and multimedia enables information and communication technologies to play a key role in the coordination or control of production and distribution from different geographic regions.

Cultural change: Success in the implementation of computer networks depends on the character and style of management, personality and activities of managers. In rapidly changing global markets, managers need to analyze information very well. The success of computer networks depends on administrators changing their approach to their subordinates. Managers have to set an approach in a way that allows employees to be flexible to react to customer needs more effectively, to improve themselves and to develop self-learning skills. In organizations that learn managers are a kind of facilitator and collaborator, employees need to be equipped with the necessary powers and have learned to organize by themselves.

Though there are many approaches to develop IT strategy in organizations, but 5 factors are generally accepted to be effective for strategic development (Smith A., Mckeen D. and Singh S., 2007):

Revising of business model means how the various parts of a business work together appropriately. It provides that everybody in companies is concentrated on the business value which company wants to create it. If business model is exact, successful strategies can be formalize on it. These strategies represent the value of company, that's why it is difficult to imitate them. Thus, IT and business managers should clearly realize how business works as a whole.

Adopting of strategic themes are planned in form as to adapt, reconfigure or cancel suitable to development of programs. Themes provide both business and IT managers broad but focused subject of interest which stimulates them surpass current operations. By grouping information technologies and business programs on several main themes, it is easier for managers to monitor and lead significant strategic flows in the course of the development of organization.

Attracting of right people one of the most significant differentiating factors between businesses which gain high technological success and which do not. In this context, one of the main factors is senior manager's role in company. So senior managers in high efficient companies have leadership role in decision-making related to IT, they regularly meet and discuss business and IT strategies with president or other senior business leaders of company. That's why businesses should try to choose the best candidate for these positions, who can create fundamental changes in company.

Collaboration with the business is the next factor affects to develop IT strategy. A accomplished strategy requires a true collaboration between business and technology, not only using of this term. Best strategic decisions are made with the participation of business and IT executives. Partnership is not only about to make business leaders part of strategy, contrary or harmonizing a business strategy and an IT strategy. Now, an effective strategy is related to continuous and active synchronization of opportunities.

Choosing right IT investment opportunities requires leader's ability on decision making. ne of the numerous advantages of effective IT strategies is that the opportunity of application of the technology in many various ways. The opportunities to benefit from technology are limitless, but existing resources are not. Therefore, it is very important to find the best way to distribute IT budget.

Finally, it should be noted that information technologies cause certain changes in organizations. These changes may be related to ensuring international activity, decreasing hierarchy and centralization, non-geographical activity and increasing accessibility. For these reasons, organizations determine complex strategies, including information technologies. Businesses must develop new strategy which support to continue activities in the competitive environment of future. When strategy is formed should revise business model, adopt strategic themes, attract right (qualified) people, collaborate with the business and choose right IT investment opportunities. Future strategy development will be more dynamic and uninterrupted process. IT strategy development should be not only more dynamic and but also focused on development

of strategic capabilities to support changing business goals. Thus, in the future, managers will be part of the strategy development process that will continuously improve business and IT plans in accordance with each other.

2.3. Special cases on the role of information technologies in successes of organizations

Information technologies are integral and vital part of modern organizations. Technology has significant role for both international companies which use mainframe systems and huge amount of databases, and small companies which have only a single computer. Organizations use the opportunities of information technologies to market their products, communicate and carry out own business. It helps the company to have customers all over the world, as well as increase the annual revenue of company.

Taking advantage of current technological trends, taking into account the changing needs of people, is one of the key factors for business success. Today, there are companies that can operate quite successfully globally with the application of information technologies. Some of the companies that are successful with the application of technology and expand their activities have been investigated in following.

In terms of using technology, IKEA is the one of the most successful companies. IKEA is a Sweden company which is one of the leaders of global market that use and benefit information technologies successfully. The opportunities provided by information technologies are widely used both in realizing and increasing sales, also in internal management. IKEA is the company operates in 433 stores of 37 countries and 50 e-commerce markets (<https://about.ikea.com/en/organisation/ikea-facts-and-figures/ikea-highlights-2019>, 20.11.2019). And management of such wide network is very difficult. But IKEA can do it effectively. All staggered IKEA branches are linked both locally and internationally to the “inter IKEA system”, which is the general system in terms of all sales, stocks, inventories and cash. This human computer integration helps to reduce

cost, needed staff, saving at land resources and so on (ukdiss.com/examples/information-management-system-of-ikea.php#citethis, 20.11.2019).

Information technologies are widely used almost in each department of IKEA. In this regard, Human Resources department is one of the strongest unit of IKEA. The benefits of information technologies are used the operations of this department and also in the recruitment process. So, recruitment starts with the test exam first. At this stage, an online test is used, which helps to understand the intellectual level, character and personal behavior of the person who applies to the particular situation. This is beneficial for the company in terms of reducing costs and saving time in the recruitment process. Each recruited employee is given a card that can be read through special card readers to ensure information security. These cards are only active during business hours in stores, and each card has pictures of employees.

As mentioned earlier, IKEA, which has a large network, needs an uninterrupted supply chain. For this purpose, IKEA cooperates with 57 different suppliers. Interestingly, all of these suppliers have joined the ECIS (own system of IKEA) system, which allows to look at inventory levels and forecasts for the future. This transparency of the supply system allows orders to be anticipated. Thus, all the requirements are met without delay with the opportunities created by information technologies (ukdiss.com/examples/information-management-system-of-ikea.php#citethis, 20.11.2019).

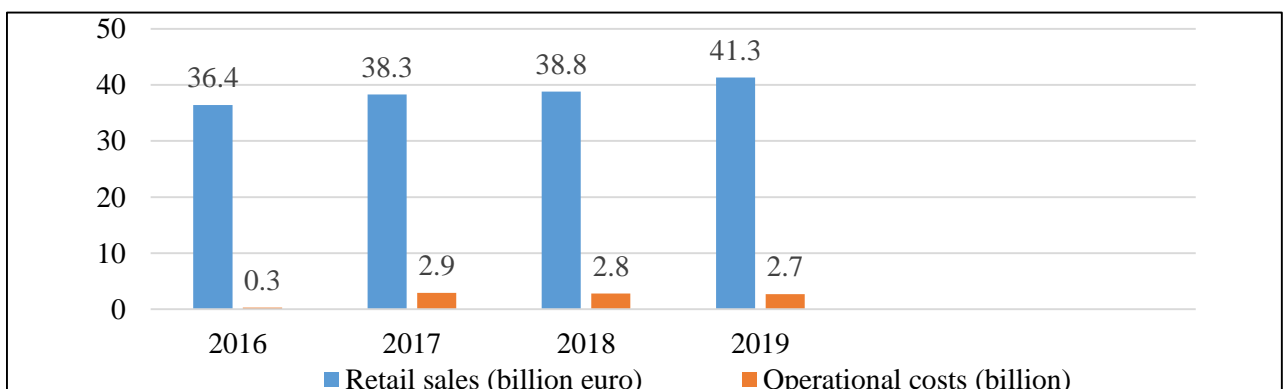
Although IKEA is increasing digitalization in internal processes, in this sense, more attention is paid to digitalization in customer services. IKEA is a brand that can sell furniture worldwide and excellent digital marketing strategy of IKEA lies behind its success. "Offline to the online business" is a key criterion of the IKEA strategy. With innovative services for both online and offline customers, IKEA is taking important steps towards becoming a technology company. It develops marketing strategies using online technologies to avoid missing the latest trends and be where its consumers are. It operates globally and uses social media effectively by taking full advantage of them. They have significant role in CRM strategy. The brand has several accounts on the same

platform for each countries. On these networks interesting posts for customers such as discount and campaigns are shared (<https://www.waca.associates/en/articles/success-story-of-ikea-from-offline-to-online-business/>, 21.11.2019). Questions from the audience are answered as soon as possible and complaints are responded.

IKEA follows the latest technology trends closely and Augmented Reality (AR) is one of them. Augmented Reality is a technology that overlaps a computer-generated image in the user's real-world view, thus providing a combined look (Hossain R. and others, 2018). This technology, which launched in 2017 and IKEA Place app offers a combined look for the brand. For the customers, it is really useful. Customers see only the catalog and could not imagine how the furniture will look and fit in their home. With the help of app it is possible for them now. On the other hand, IKEA has also introduced smart store concept with Virtual Reality (VR) technology and they benefit from the opportunity to try it virtually before customers buy the furniture. All of these tools enable customers to shop easier and help to increase customer loyalty.

The use of easy payment methods (especially PayPal) for customers and frequent renewal of the website also attract the attention of customers, as a result increase the sales (<https://digitalagencynetwork.com/ikea-digital-marketing-strategy/>,24.11.2019). Increasing in the total sales can be seen from following chart:

Figure 5: Retail sales and operational costs by 2016-2019



Source: <https://inter.ikea.com/en/about-us/annual-reports/>, 24.11.2019. Prepared by the author based on IKEA annual reports.

As can be seen from the table, the steps taken to become a technology company have already begun to show more results in 2019 and there has been a significant increase in sales due to online sales. There is a significant increase in indicator of operational costs in 2017. The main costs in the operational cost are spent on the application of innovation in the provision of products and services. As mentioned earlier, in 2017 the launch of the new app and other technological steps are also reflected in these costs. In the following years, these costs decreased: 380 million was spent on technological development in 2018, and 175 million in 2019. The expansion of the application of technology also stimulates the growth of e-sales through the website. And the following table contains information on changes in store and website visits over the last 4 years:

Table 2: Store and online visits by 2016-2019

Years	Store visit (mln eur)	Website visit (mln eur)
2016	915	2.1
2017	936	2.3
2018	957	2.5
2019	1.000	2.8

Source: <https://inter.ikea.com/en/about-us/annual-reports/>, (25.11.2019). Prepared by the author based on IKEA annual reports.

According to the results of the last 4 years, there is an increase in the number of store visits and website visits. According to the results of 2018 and 2019, the increase in the number of website visits (10.7%) exceeded the increase in store visits (4.3%). At the same time, there was an increase in e-sales. Thus, according to the results of 2018, the growth in e-sales was up to 5% of total retail sales. In 2019, e-sales grew more than 46% and accounted for 11% of total retail sales (<https://inter.ikea.com/en/about-us/annual-reports/>). This can be considered a positive result of the growing investment in information technologies, especially since 2017.

IKEA also develops different strategies and products to enter the smart home market. Among the works done in this direction, the introduction of smart plugs and

speakers to the market is remarkable. The development of such strategies, products and services will enable IKEA to compete better in the market both now and in the future. So IKEA can be considered a successful example which use innovative information technologies to create relationship with customers and suppliers, to manage internal processes effectively and to maintain leadership in the market.

The next successful business is P&G which uses the maximum advantages of information technologies. P&G has been a leader in consumer goods sector for several decades. Company, which operates in more than 80 countries, earns \$69.6 billion a year (<https://www.pginvestor.com/CustomPage/Index?KeyGenPage=1073748359>, 28.11.2019). With some “smart” product launches P&G is leader of digitalization among CPG (Consumer Packaged Goods) companies. Consumers interact with products of brand and because of that data is more important in CPG than anywhere. CPG is characterized by ruthless competition between companies. For this reason, P&G tries to get more data to beat in CPG sector competition. The mission of P&G is to become one of the most digitally connected companies of the world with the help of innovative technologies.

One of the main reasons for P&G success can be considered the establishment of a perfect supply chain. Digitalization increases specialization in products and services, thus ensuring the delivery of quality products to consumers. With the help of digital technologies, a properly integrated and synchronized supply chain is established between the manufacturer, supplier and customers through a common database. Building such an advanced chain allows to respond more quickly to changing demands and unforeseen events. Control of this process through a central system ensures the reduction of errors in the supply chain. Through an electronic tracking system, potential failures are eliminated, breakdowns are reduced, and system efficiency is maximized (<https://digital.hbs.edu/platform-rctom/submission/pg-going-digital/#>, 30.11.2019).

In transportation and logistics, a system called "Control Tower" is used, which allows to control all issues related to transportation: raw materials, incoming, outgoing and finished products. P&G ranks 3rd in the United States in terms of trucks with the

help of “Control Tower” system. This system causes 15% reduction in “deadhead” movement (empty or non overload truck). It does not only reduce costs, but also supports the measures taken to become a green company. In distributor operations is used a similar system, the “Distributor Connect” interface (<https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/inside-p-and-ampps-digital-revolution>, 30.11.2019). It helps P&G to communicate directly and support distributors in their work. This system helps to increase the quality level of service to both parties.

Work is also being done to establish advanced digital connections with retailers. In this regard, a standardized GDSN (Global Data Synchronisation Network) database is used, which provides completely automatic trading with retail partners without human intervention. Using this system saves millions of dollars by reducing the number of errors in orders.

Recruitment at P&G requires special programming, modeling and computer science skills. The employees have a "cockpit" interface in their computers. In this system, tolerance limits are determined on the basis of special metrics. The alarm is activated when there is any change from these limits to positive or negative. In this case, it is possible to see what happened by clicking, to react to what happened in real time (Ozkan N, 2015).

P&G top management teams also benefit the advantages of information technologies are provided for them. They organize weekly physical and virtual meetings. These meetings, held in a high-tech conference room called Business Sphere, show data from special IT-supported data dashboards using Data Science (Data Analyst). It creates a visually more comfortable image and allows to make decisions easier.

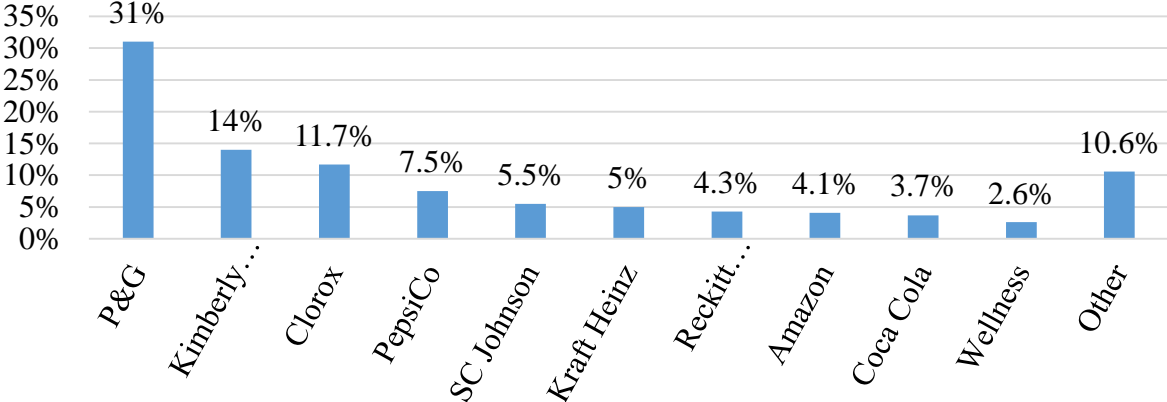
The technology also allows P&G to connect and build strong relationship with customers anywhere in the world. With products P&G wants to become a company which builds these important relationships and digital technology make it possible.

With the help of digital technology, it is now possible to establish a one-to-one relationship with each consumer all over the world. It creates a competitive advantage and increases the value of the product for the customer. Based on the information obtained through the system, a value-based CRM strategy is built, which allows P&G to gain a larger market share (<https://www.pg.com/annualreport-2019/index.html#/letter-to-shareowners/Growth>, 02.12.2019).

Based on customer data, a "consumer pulse" system is used that classifies all customers based on their comments, sorts them by brand, and directs them to the appropriate people for analysis. In this way, even top managers can see such customer feedback. This allows to react quickly to what is happening in the market. And customers can get information about production lines with iPads through the system in manufacturing plants (<https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/inside-p-and-ampps-digital-revolution>, 02.12.2019).

Main digitization attempts of P&G are focused on interaction with the consumers. In this regard, they launched the web-enabled toothbrush with the smartphone application, which follows the brushing habits and offer the oral care recommendations while transferring the data to P&G. Later when Amazon released the Dash buttons in 2015, P&G became the main partner of these devices which would allow users in few seconds to order P&G products chosen from Amazon.

Figure 6: Amazon Dash: sales distribution by brand 2016



Source: <https://www.statista.com/statistics/529861/cpg-brands-amazon-dash-share/>, (05.12.2019)

While they all offer P&G better consumer information and the opportunities to strengthen their interaction with the consumer, they create value (easiness, data, efficiency) for the end user. Starting as a “consumer understanding” with the consumer, P&G is the main strength on which other strengths are based, including efficiency, innovation, entrance to market, branding and scale.

In the future stronger analytic skills and integrated digital consumer interactions will be the main features for CPG companies. Though P&G is in a good position, they will probably need a more comprehensive approach to truly win consumers. Consumers will need to sight how products with digital capabilities of P&G come together in their lives to achieve the greatest effect. P&G will also have to stay in front of innovation to take advantage of this opportunity. It means making large investments in R&D and enabling employees to use design thinking to create new products which can be component of a digitally integrated system that meet with consumers. They will also need to continue researching partnership opportunities with Amazon and other technology companies who invest in digitalization to learn the consumers’ behavior to develop based on how they interact with products.

In fact, through some applications that make everything simpler - with the leap of technology, the formation of a more developed world will accelerate. Everything can be done with the smallest, cheapest devices, because this is what is required to continue in the market. As P&G provides it in the current conditions, can be assumed that it will continue to play an important role in the sector.

As mentioned at the beginning of this paragraph, both multi-national companies and smaller organizations take advantages of information technologies. In this regard, Yapi Kredi Bank, one of the largest and leading banks in Turkey, which is quite successful at the local level, can be an example. Yapi Kredi Bank both develops the process and construction, products and services in accordance with the digital age, and takes measures to form appropriate responses by anticipating the next step of the customers. The technological transformation that began in 2011 went even further than

in 2014. The bank, whose vision is to become a technology leader, launched a new development strategy in 2014, and the main theme of this strategy was digitalization ([https://www.Yapi Kredi.com.tr/yatirimci-iliskileri/sunumlar](https://www.YapiKredi.com.tr/yatirimci-iliskileri/sunumlar), 10.12.2019).

In 2014-2016, all digital channels such as internet banking, mobile banking, ATM, call center were completely updated. In 2017, Yapi Kredi Bank strengthened its claim with the slogan "Digital Bank of Turkey". This slogan is also reflected in PR and CRM strategies. Thanks to all efforts, Yapi Kredi Bank has already reached 6.5 million active digital users. When this work began in 2014, the figure was 1.9 million people (isteteknoloji.com.tr/roportaj/2020/03/09/bankacilik-uygulamalarimizi-bulut-teknolojileri-uzerinde-calistirabilmek-icin-bir-teknoloji-donusumu-baslattik/, 10.12.2019). Currently, 7 out of 10 customers of the bank are digital customers, ie they are actively operating through digital channels.

Launched in 2014, the attack is not just about digitalizing customer channels. It also aims to develop the processes within the bank. At this point, the work done to change the operational model of the bank can be noted. In this regard, in late 2019, a new 3 years program called Target Operational Model was launched. This program aims to digitize and centralize all processes. Under the program, paper was initially rejected and approval issues were digitized. It does not only reduce the physical dependence between departments, but also reduces the time spent on approval. Thus, the number of digitally certified documents has increased and currently 74% of consumer loans are digitally confirmed (<https://www.fortuneturkey.com/yapi-kredi-ile-dijital-donusumun-otesi-41109>, 12.12.2019).

In Yapi Kredi Bank Big Data, which is widely used in the banking sector, is also supported by relevant technologies. Machine learning and AI technologies are used for this purpose. For example, instructions received from customers are converted to text using the Optical Character Reader (OCR). System understands any task which is wanted by customer and automatically converts it to the result. It is done through deep learning, which serves to increase the ability to understand what system is listening to.

The R&D department has a dedicated team working on Natural Process Learning (NPL) and AI. All these steps serve to use more benefits of the data (isteteknoloji.com.tr/roportaj/2020/03/09/bankacilik-uygulamalarimizi-bulut-teknolojileri-uzerinde-calistirabilmek-icin-bir-teknoloji-donusumu-baslattik/, 24.03.2020).

Another activity, in which AI is widely used, is the introduction of chatbots. Use of them began in 2019. Chatbot understands and answers what the customer wants to ask based on frequently asked questions (interest rates, branch addresses). If there are more different questions, it directs them to the customer representatives. 80% of dialogues are answered without referral to the customer representatives. Another area where NLP and ML apply is the analysis of financial statements. Thus, when issuing business loans, a financial analysis must be conducted, for which the reports firstly must be in a standard form. Yapi Kredi Bank employed 60 people to do this work. However, now the standardization, data transmission and financial analysis they done are completely automated via AI. And those 60 people work in local departments.

A new system is being developed to increase flexibility in action. Thus, in accordance with the requirements of regulators, Turkish banks are banned from using foreign cloud technologies. Therefore, Yapi Kredi Bank is working to build internal cloud technology from 2019. In the future, if cloud technology is created in Turkey, it is planned to integrate this internal application into the overall system.

Fintech is working to take the banking system to the next level. Yapi Kredi Bank, which is the first bank in Turkey, which carried operations with computers, launched telephone banking, used voice recognition system for the first time and implemented the first online application, knows no bounds in technology with its innovations in banking. In addition, Yapi Kredi Bank provided the opportunity to access mobile banking via Eye-ID, which is the first not only in Turkey but also in Europe. One of the first things the bank did is to make mobile banking manageable from the Apple Watch (<https://webrazzi.com/2016/03/21/teknoloji-nerede-yapi-kredi-orada/>, 26.03.2020).

Another work done in cooperation with fintech was the establishment of Yapi Kredi Technology in 2015. Yapi Kredi Technology does an important work to create new technologies. Launched in 2016, the Intelligent Management System (IMS) and Sapphire are the most important work done. IMS has the ability to predict future work and determine the next stage of the process. Sapphire digitizes the information in the payment documents submitted by the customer through artificial intelligence without human interference and makes it ready for approval. The process initiated by artificial intelligence is completed with the approval of a person. This system can convert millions of payment documents electronically a year without human labor. This technology was selected as the best project in the country in 2016 in the category of "Digitizers" (techinside.com/yapi-krediden-yapay-zekali-verimlilik-uygulamasi/, 26.03.2020).

Yapi Kredi Bank also uses the development of technology in CSR strategies. "Code.Yapi Kredi" is a successful CSR project launched several years ago. The project provides free coding training to people of any age group, as well as seminars to raise awareness on the subject. The next CSR project was the introduction of voice ATM menus for visually impaired customers. It does not only reduce the need for customer representatives, but also creates a positive image of the bank by increasing customer satisfaction.

The bank is still working on the development and application of technology. Automation continues in both internal processes and other relationships with customers or partners. With this progress, Yapi Kredi Bank will remain one of the most innovative banks in Turkey and Europe in the years to come.

Above 3 organizations operating in different sectors such as furniture, consumer goods and finance are reviewed. Each of the organizations is one of the leaders at the local or international level through the use of information technologies in their sectors. Despite the differences in the sectors in which they operate, there are general tendencies in the use of technology. So, these given examples show that technology is important in building efficiency in management in the organization, as well as in building

effective relationships with partners and customers, also in customer service, reducing costs and increasing revenue to some extent.

CHAPTER III. INFORMATION TECHNOLOGIES IN THE MANAGEMENT OF CORPORATE AND CUSTOMER RELATIONS ON THE EXAMPLE OF INTERNATIONAL BANK OF AZERBAIJAN

3.1. Application of information technologies in Azerbaijani banks to improve their competitiveness

In a globalizing world, the role of information technologies in any business is growing day by day. At present, the main directions of development of information and communication technologies are fully applied to banking services. In this regard, in Azerbaijan also measures are taken to apply innovations. There is an objective basis in the direction of development of this sector, in the establishment of a new information economy and network mechanism, most importantly, the application of advanced information and communication technologies (<http://e-qanun.az/framework/27284>). The transition to an information (network) economy in the banking sector has led to significant changes in key organizational mechanisms to ensure the social and economic progress of society, primarily because it is competitive on the basis of modern information technologies and network management.

The banking sector is the most widely used area of digitalization and innovation in our country. The opportunities of information technologies are used to create convenient services for customers, implement marketing strategies, as well as to improve the organizational structure through internal communication, risk management, automation of processes. Due to these features, the analysis of information technology in the banking sector is more expedient.

Significant steps have been taken in the banking sector in Azerbaijan, especially in the last 10 years, towards the application of technology and digitalization. In recent years, measures have been taken at the national level to regulate and control it. These measures include the goals set out in the Strategic Roadmap for the Development of Financial Services in the Republic of Azerbaijan for 2016-2025 and the Strategic

Development Plan for 2016-2020 by the Association of Banks of Azerbaijan (ABA). Thus, one of the main goals of these strategic plans is to ensure the digitalization of banks.

The first digitization work was carried out in 2009 by the Azericard processing center for the majority of local banks (Amrah Bank, AG Bank, Ata Bank, Bank of Azerbaijan, International Bank of Azerbaijan, International Bank of Azerbaijan Moscow, Bank Nikoil, MuganBank, Parabank, Rabita Bank, Bank Respublika, Turan Bank, Bank Technique, Xalq Bank, Silk Way Bank, NBC Bank, Bank Eurasia, Bank BTB, Caucasus Development Bank, AtraBank, AFB Bank). It should be noted that some of these banks still use updated versions of this application (<https://www.azericard.com/az/xeber?newsID=82>, 30.03.2020). Thus, in order to use this application, a code is obtained from the relevant ATM using the cards belonging to the above-mentioned banks, and the application is activated through this code. The application allows you to check your balance without going to the bank, get an account statement, perform card-to-card transactions, pay for mobile, Internet, utilities and TV services and block the card if necessary.

In the following period, in 2015, Millicard processing center launched CIB mobile application. There are no restrictions on the use of the services of this application. Thus, it is possible to register with any bank card and there is no limit on the number of cards added to the application. Also, unlike the application provided by Azericard PC, there is no need to get a code from an ATM (https://millikart.az/az/single_news_16.html, 30.03.2020).

However, over time, banks have introduced their mobile banking applications to customers in order to take full advantage of the capabilities of their products. Currently, banks such as International Bank of Azerbaijan (IBAM), Bank of Baku, Kapital Bank (Birbank), Expressbank, Yapi Kredi Bank, AccessBank (myAccess), AGBank, Unibank and Pasha Bank use the opportunities of their mobile applications. Initial versions of some of these applications were created for any specific product of the bank.

For example, the Unibank mobile application was created for Albali Card, the Bank of Baku mobile application was created for Bolkart and the mobile application of AG bank was created for Hazz Card and then covered general banking services. It is even possible to get a digital card without going to the bank through applications such as Unibank and Birbank.

In order to maintain its existence and ensure its future development, banks are forced to take advantage of the achievements of e-banking. Otherwise, it will not be able to adapt to the demands of the time and its ability to compete in the market will be questioned. It is clear that digital banking leaders and outsiders are developing different strategies in this process. Market leaders are working to eliminate mobile banking from other service channels and to transfer all services offered by the bank to customers to the mobile application (Abdullayev T., 2019). It is also possible to make IBAN transfers by increasing the new technology capabilities of the mobile device, make cardless payments with NFC (Near Field Communication)/smartphone, take advantage of "ASAN Imza" not only to access the application, but also to use opportunities of remote mode, the camera or NFC to recognize the card, be able to use the face recognition function to identify and order new products and to realize other services. Outsiders, on the other hand, need to think about the functionality of their programs before setting such ambitious goals. Customers should be able to perform at least simple banking operations through the application. They need to expand customers' ability to make payments and transfers through software so that they can manage their bank accounts without going to the bank. In addition, they should make the registration process and the document acceptance processes required for transfers more functional. According to the data of 2017, the best mobile banking program in terms of functionality and convenience in the field of mobile banking in Azerbaijan belonged to Unibank. According to Marksweb, the application ranks 22nd in the overall ranking of banks in the CIS. At present, the Birbank application owned by Kapital Bank ranks first in terms of the number of downloads (more than 1,000,000).

Table 3: Rating of mobile banking applications in Azerbaijan

Bank	Rating for Iphone	Bank	Rating for Android
Unibank	22	Unibank	21
Bank Respublika	31	Bank Respublika	31
Kapital Bank	36	Kapital Bank	35
IBA	41	IBA	41
Yapi Kredi Bank Azerbaijan	42	Yapi Kredi Bank Azerbaijan	42

Source: <https://markswebb.ru/report/mobile-banking-rank-cis-2017/#full-report>. (30.03.2020)

According to Marksw Webb, the average score for the surveyed mobile banks of the countries, as well as the best mobile banking rating of the countries characterizes the level of development of mobile banking services. The highest 45 indicators of efficiency of mobile banks belong to Russian banks, followed by Belarus, Georgia, Kazakhstan, Ukraine and Azerbaijan.

In the study, 86 mobile applications for individuals from 43 banks were evaluated separately on iPhone and Android smartphones. Two factors were used as criteria in the study:

- functionality: the ability of the user in the program to be a debit card or dollar account;
- convenience: ease of the program interface and how easy it is for the user.

Considering the characteristics of rating leaders (<https://markswebb.ru/report/mobile-banking-rank-cis-2017/#full-report>, 30.03.2020):

1. Maximum simplification of remote registration of bank customers, requiring a fingerprint or simple code consisting of several digits for registration;
2. Opportunities to transfer own funds. Mobile banking is a substitute for Internet banking in terms of managing its financial resources;
3. Outside of ratings, the best mobile banks offer convenient search and transaction history filters without limiting dates, and allow you to upload, pay or transfer receipts;
4. Mobile application - a channel for ordering new products (cards, opening of account and deposits, credit applications) and a tool for managing the products presented to the customer. The existence of such an opportunity in mobile banking

virtually closes the banking service in the mobile application - the customer can solve all the basic tasks on a smartphone.

The features of mobile banking in Azerbaijan are as follows (Süleymanova S., 2019):

1. Ability to make interbank transfers on the basis of details: to make a transfer, it is enough to specify only the IBAN and the full name of the recipient, which is easier than, for example, in Russia, to indicate the RIC, account number and full name;

2. The existence of Asan Imza, the electronic identification system of citizens, which laid the foundation for further development of banking in Azerbaijan: In Russia, such a system (United Identity and Appointment System - UIAS) is used only for public services and has not yet been included in the banking sector;

3. In many mobile banks in Azerbaijan, such as IBA, Kapital Bank, Bank Respublika and etc. individuals can withdraw or transfer cash without using a card. In some countries, this function is performed only by the most advanced banks;

In the following tables 4 and 5 are shown the dynamics of the volume and number of e-services provided by debit and credit cards offered by banks as a result of the application of technologies over the past 7 years.

Table 4: Number and volume of electronic transactions via debit cards

Years	Volume of electronic transactions via debit card (million manat)	Number of debit card transactions (thousand)
2014	75	5440
2015	140	8489
2016	209	9792
2017	413	14694
2018	1111	22511
2019	2533	37719
2020 (january and february)	465	7545

Source: <https://uploads.cbar.az/assets/a0c2949dd0f72f1e02cae5f82.pdf>. (30.03.2020). Based on the information prepared by the author.

As can be seen from the table, the volume of electronic transactions in the first two months of 2020 is about 7 times higher than in 2014. If we compare the results of transactions volume of 2014 with the general results of 2019, we see that this figure is

33 times higher, the CAGR is 80%, and when we look at the number of transactions for the same period, this increase is 7 times higher, the CAGR is 38%.

Table 5: Number and volume of transactions via credit cards

Years	Volume of electronic transactions via credit card (million manat)	Number of credit card transactions (thousand)
2014	71	1780
2015	143	3021
2016	209	9792
2017	117	2572
2018	382	3617
2019	402	6060
2020 (january and february)	70	1558

Source: <https://uploads.cbar.az/assets/a0c2949dd0f72f1e02cae5f82.pdf>. (30.03.2020). Based on the information prepared by the author.

In electronic transactions via credit cards, the figures for the first two months of 2020 are almost equal to the total for 2014. If we compare the results of 2014 with the results of transactions volume of 2019, we see that this figure is 6 times higher, the CAGR is 34%, and if we look at the number of transactions for the same period, the increase is 3 times higher, the CAGR is 23%.

Looking at both tables, we see that the results have increased even more since 2018. This may be due to the fact that banks began to invest more in innovations and new products due to the stabilization of the situation caused by the devaluation in february and december 2015. So in the stabilization process banks only were trying to protect existence in the market. During the period of stability, significant works were done to grow, expand market share and apply innovations.

Based on the above, it can be said that banks in the country are taking steps to digitalize to meet the needs of more customers. The opportunities of information technologies are widely used in the formation of marketing and CRM strategies. Various channels are used to inform customers about the news. In this regard, social media has particular importance. Bank accounts on social networks provide

information about various products and campaigns, customer questions or complaints from these channels are answered operatively.

Recently, along with the volume and quality of e-services provided to customers, it is important for banks to work on the application of innovative technologies in internal management. Thus, it is important to establish business relations between employee-employee and employee-manager with the application of proper internal communication systems. The recent social isolation measures due to the COVID-19 virus have once again highlighted the need for extensive use of information technologies in organizations in this area. Thus, people were forced to work from home, and to ensure this, organizations have adapted their systems to this situation. Campaigns were conducted to encourage customers to actively use mobile banking, while back office staff were provided with home-based activities. Thanks to the use of advanced technologies, International Bank of Azerbaijan, Pasha Bank, Kapital Bank and Unibank were able to create appropriate conditions for their employees to work from home. This proves how important technology is for organizations in such crisis situations.

In addition, banks use the capabilities of Big Data or Data Analyst to manage risks, including compliance. For this purpose, the vast majority of banks in the country use the World-Check program. “World-Check” is the solution for conducting Due Diligence checks to combat financial crime, bribery and corruption. World-Check data and a modern automated verification solution ensure the accuracy of Know Your Customer (KYC) verification and counterparty verification. The specialized World-Check solution makes it easier to comply with laws on combating money laundering and terrorist financing by checking and monitoring political officials (PEPs), as well as other individuals and organizations with a high level of risk. Optimize verification with custom settings for accuracy criteria for matches, as well as useful features for individual users and large companies. The World-Check platform allows to automate the process of conducting checks and making decisions about the integrity of

counterparties. It allows banks to ensure customer identification and minimize the risks associated with it.

Also, scoring systems based on Big Data correlation-regression models are widely used to reduce credit risks. Thus, when entering information about the client applying to this system (Credit Scoring Model), the customer's risk rating score is calculated on the basis of the indicators specified in the system. It allows managers to make decisions about customers and minimize future solvency risks.

Based on the analysis of the development of information technologies in banks of Azerbaijan, it can be said that although the application of innovations in the banking sector is developing, it is still not at the desired level and lags behind international experience. But works in this sector should be continued. Thus, using modern banking innovative technologies, banks realize their successful development, which in general has a decisive influence on the development of the entire banking sector. The innovative development of the banking sector is a priority in modernizing the activities of banks and the economy as a whole.

3.2. Implementation of modern information technologies in International Bank of Azerbaijan

The previous paragraph provides information on the application of information technologies in the banking sector of Azerbaijan and its impact on them. The International Bank of Azerbaijan is one of the most innovative banks in the country. The work done by the bank to become a leader, especially in recent years, is noteworthy.

The International Bank of Azerbaijan is not only the largest bank in the country, but also one of the three leading banks in the application of innovations. In particular, the Bank has been doing significant work in the last 5 years to automate processes and digitize services. The measures taken in connection with the technology, the work done to increase literacy in the field of technology in the country can also be attributed to the

steps taken by the bank in this area. Based on this, the research on how to use the opportunities of information technology in the bank is of interest. In this regard, the impact of digitalization on the revenues of bank, relationships with customers and partners is considered.

International Bank of Azerbaijan (IBA), currently the largest bank in Azerbaijan, started its activity in 1990 as a branch of the Bank of Russia. In 1992, the bank grew in size and became a full-fledged bank. The bank is headquartered in Baku. IBA is one of the leader banks in South Caucasus region for assets, international operating portfolio and customer base. With 37 branches and 39 divisions covering different regions of Azerbaijan, bank provides all banking services to individual and corporate clients. The number of corporate clients served by bank is more than 17000, the number of active plastic cards is more than 1.3 million. IBA-Moscow LLC, International Insurance Company OJSC, Azericard LLC, IBA GEO JSC and International Leasing Company LLC are subsidiaries of the bank (<https://ibar.az/az/about-bank/bank-at-a-glance/>, 06.04.2020).

In recent years, the IBA has been supporting the development of cashless payment infrastructure in the country and increasing the number of e-services provided. The goals included in the Bank's adopted strategic development plans also prove this. The 5 year strategic plan adopted in 2010 envisages expanding the use of new technologies. Then, on October 28, 2019, the IBA announced a new Strategic Development Plan. Thus, the restructuring process of the IBA has been successfully completed, and now the main objectives are aimed at increasing the profitability of bank and the introduction of innovations. One of the most important business goals of the strategy is to plan for significant development of the technological capabilities of bank during its implementation. By increasing these opportunities, programming activities will be accelerated, the quality and availability of data will be increased (https://ibar.az/site/assets/files/6857/az_rbaycan_beyn_lxalq_bank_n_n_inki_af_strategiyas_n_n00_compressed.pdf, 06.04.2020).

IBA is also taking measures to stimulate non-cash payments in accordance with the state program. For this purpose, in february of this year introduced the product "Ring Pay". "Ring Pay" performs many functions of an ordinary plastic bank card. In most places where it is possible to make contactless payments with VISA cards, it is possible to make payments in a short time using these rings. When making a payment, it is enough to bring the top of the ring closer to the POS terminal. The payment transaction is completed in just 1-2 seconds (<https://ict.az/en/news/5359/>, 08.04.2020).

Since june 2017, IBA has been conducting internal operations on the basis of the Business Process Management (BPM) technical platform in order to optimize business processes. The application of this product in the International Bank of Azerbaijan will help to automate business processes, increase work efficiency and improve the quality of customer service. Business process optimization is one of the IBA's strategic projects.

BPM software provides important advantages for IBA. These advantages are as followings:

- Helps the bank to facilitate all critical business processes;
- Reduces the fraud situations because of the limited authorities of employees;
- Helps to determine complete view of detailed processes, duties and responsibilities of departments;
- Helps people connect with people in the organization;
- After its application, the approval period is reduced by 75%;
- Saves resource, time and ensures the efficiency of staff;
- Helps select customer management processes, also helps employees make quick decisions;
- Not only serves customers better, but also serves effectively;
- Helps to strengthen customer relations.

Based on the results of the last 4 years, the IBA's cash flow report shows a significant reduction in operating expenses. The role of BPM in this reduction is not

excluded. Factors such as increased automation and reduced additional document flow can result in lower operating costs.

Table 6: Annual operational costs of IBA

Years	General and other expenses related to operating activities (thousand manats)
2016 (first 6 months)	51,330
2017	56,263
2018	22,242
2019	12,613

Source: ibar.az/az/about-bank/disclosure-of-information/diger-hesabatlar/#cash-flow-statement. (08.04.2020). Based on the information prepared by the author.

In 2017, IBA introduced a mobile banking application called IBAM to increase the level of e-services provided to customers and not to lose in the existing competition in the market. Only the password sent to the phone number is used to connect to the application. The following services can be provided through the application without going to the bank:

- Obtaining account information;
- Obtaining information on the type, status and balance of all plastic cards available in the bank;
- Obtaining transaction history on cards and current accounts;
- Blocking and unblocking cards;
- Activation and deactivation of “SMS-notification” service;
- Transfers to cards belonging to both the International Bank of Azerbaijan and other banks in the country;
- Transfers between the customer's existing cards and bank accounts;
- Information on the addresses of the bank's branches, ATMs and payment terminals;
- Constantly updated exchange rate information and currency converter;
- Payments for utilities, mobile communications, internet, cable television and a number of other services.

As an innovative bank IBA, which is constantly developing digital banking platforms, continues to create new opportunities for mobile application users. The opportunities created include ordering a loan, repaying monthly loan debts, as well as controlling the monthly loan repayment schedule and changing the card password through the application. One of the new services created at IBAM is the Cash by Code service. It is possible to withdraw money from an ATM without a card using the code generated by the system during the transfer to the recipient of funds through this service. Along with this work, work is underway to create a new banking application and it is planned to introduce it in the near future.

IBA, which continues to support the development of cashless payment infrastructure in our country, took another important step in this direction last year. For the first time in Azerbaijan, in partnership with VISA International, the bank has introduced a contactless payment method using NFC technology. The new payment method allows customers to make contactless payments through their mobile phones at POS terminals without the need for a plastic card. To make a payment, simply activate the appropriate function on the phone and bring the phone closer to the POS terminal (ibar.az/az/news/az-rbaycan-beyn-lxalq-bank-nfc-texnologiyas-n-olk-miz-g-tirdi/, 08.04.2020).

IBA is constantly developing e-banking services. For this reason, it has been awarded a number of domestic and international awards. As a result of the competition held jointly by the Central Bank of the Republic of Azerbaijan and the Association of Banks of Azerbaijan for the development of cashless payments in 2018, the IBA won first place in the nomination "Leader Bank for Electronic Banking Services" (<https://uploads.cbar.az/assets/26cff039acbd4a773948bc06b.pdf>, 05.04.2020). In March 2020, it was named the best bank in Azerbaijan by Global Finance magazine (<https://d2tyltutevw8th.cloudfront.net/media/document/press-release-worlds-best-banks-2020-asia-paci-1584221521.pdf>, 05.04.2020). The main criteria for this award are product innovation, asset growth, business development and strategic relationships.

Despite the work done in the field of e-banking, customers who need to come to the bank have the opportunity to use the Randevu service. Thus, through this service, the customer can use the services without wasting time waiting in line at the branches of bank. To do it, the customer can apply through the service 1 day in advance and take turns.

IBA has initiated the establishment of the SME Club for the first time in the country to bring together corporate customers, provide preferential services and stimulate exports. In order to make easier the work of club members, who use the Internet Banking service, the Mailbox function has been added to this service. The new feature allows legal entities and individuals to conduct official correspondence with the bank, including scanning many transaction documents without visiting the bank, sending them through Mailbox or receiving them online from the bank. Also, SME Club members are offered by the bank many innovative solutions for automation of processes in enterprises of any profile within the framework of ERP provision. The proposed solutions include innovative systems such as ProID (Intelligent Human Resource Management), ProCALL (Universal Call Center Platform), ProSCHOOL (Electronic Education Management System), ProDOC (Electronic Document Management System) and ProORDER (Supply Chain Management). In addition, Cloud solutions are offered to manage data flow more conveniently, in any space and through any device. This system makes it easier to analyze and report on business processes such as human resources, trade, finance, assignments, recruitment, and so on (<https://sahibkarlarklubu.az/>, 04.04.2020).

As the development of the ecosystem related to innovative technologies in our country is one of the main goals of the IBA, it also works in this area within the framework of CSR activities. The International Bank of Azerbaijan has taken another important step in the FinTech sphere and strengthened its position in this sphere. In this regard, the first IBA Regional Hackathon, organized by the IBA in march of this year to support entrepreneurship, took place. About 40 teams competed in Hackathon.

Representatives from 12 countries also took part in the idea marathon. Most of the participants were local professionals, entrepreneurs and programmers, as well as other professionals. The teams developed prototypes of their projects for 36 hours with the support of 25 professional mentors from different countries. A total of 40 projects on innovative solutions in the field of entrepreneurship were submitted to the Jury of the 1st IBA Regional Hackathon. The first place team won with a project prototype that provides financial transparency to small and medium-sized businesses, simplifies inventory and other operations. The IBA mPos project, initiated by the 2nd place team, allows entrepreneurs to turn their mobile phones into POS terminals with the help of a special application. The third place team won with an innovative project that helped improve the money transfer system.

In addition, one of the activities carried out in the field of Information technologies within the framework of CSR policy was the establishment of Itech Academy. This project aims to support the training of professional IT specialists, taking into account the needs of the labor market of our country. The Academy was supported by the IBA and the education was completely free. Young people who want to build a professional career by gaining knowledge and skills in the field of IT have the opportunity to study at the Academy. Based on the bootcamp trainings organized at the academy, additional training was provided on Mobile Application and Business Intelligence, covering 2 main areas, including FrontEnd and BackEnd. Meetings of local and foreign experts in the field of Mobile Application, Business Intelligence, Product Management, Data Science with students and various online workshops were also held. Measures have been taken to hold the IBA Tech Academy established by the International Bank of Azerbaijan (<https://ibar.az/az/news/az-rbaycan-beyn-lxalq-bank-n-n-iba-tech-akademiyas-f-aliyy-t-ba-lad/>, 07.04.2020). The main feature of the new program is to create an opportunity to study at the Academy in this speciality, taking into account the need for professionals in the field of mobile development in our country.

Since the end of last year, the Transformation Office at the IBA has been operating to ensure international cooperation in order to apply technological innovations in the international sphere. At the initiative of this office, work is underway to implement new software to be used in operations, electronic document management and risk management.

However, despite being one of the most innovative banks in the country, IBA lags behind not only Europe but also Turkey in the application of technology compared to Yapi Kredi Bank, which was studied in the previous chapter. It is expected that digitalization projects, which started more actively last year, will show their results in the near future and will adequately represent our country not only in Azerbaijan, but also in the global arena in the application of required technologies.

In conclusion, based on the situation in the banking sector, it is necessary to identify the main methods and tools needed for enterprises to optimize their business processes. Thus, managers need to understand the importance of IT and apply it properly for effective management of the organization. Currently, organizations should not only focus on management, but also on the reshaping of the budget and inter-related processes that affect large-scale operations. Properly applied technologies increase productivity, competitiveness and the ability to achieve effective results.

CONCLUSIONS AND RECOMMENDATIONS

From the above, it can be concluded that in order to continue to compete in the market in the context of changing human needs and globalization, all organizations must use the opportunities of innovative technologies, both in internal management and communication, also in building relationships with customers. Companies do it by applying the right information technologies to gain momentum in a competitive environment.

As a result of the impact of information technologies, increasing digitalization has become increasingly important for companies all over the world. In general, these effects of digitalization can be summarized in 3 groups: The first is data management and analytics. It encompasses the fact that the processing and interpretation of all kinds of data (structural and non-structural) and the technologies behind them can be transformed into analytical results, actions and differentiations in service. The second is the customer experience and the interaction of the digital ecosystem built around it. It turns out that this digital ecosystem, in which all kinds of smart devices communicate with each other thanks to the Internet of Things and with the variety of services offered by structures such as Fintech, should be designed to improve the customer experience in the society. The third, it can be generalized, such as enterprises digitalizing their organizational structures, working model and business processes, making them smart and reliable.

The following results were obtained from the research:

1. Information technologies have particular importance in further enhancing the success of organizations, and ensuring this effectiveness can be addressed by taking into account several factors (size, maturity, management style, etc.) including the structure of the organization;

2. Based on the experience of large companies, when developing IT strategy of an organization, it turns out that the overall business strategy, mission and vision of the

organization should be taken into account, and a strategy with a wide role of new technological trends should be developed;

3. Investing in advanced technologies allows enterprises to increase their competitiveness in the world market and occupy one of the key positions in the world economy;

4. Application of high technologies creates conditions for increasing the profit of the enterprise, labor productivity and attracting more qualified personnel;

5. Through the application of various technologies, enterprises also provide information security, which has vital importance for them;

6. With the help of information technology, distance problems, also rigid hierarchies and miscommunications between structures are eliminated.

The application of IT in the management process of Azerbaijani enterprises is still in its infancy. The banking sector may be an exception in this area. Thus, the largest banks of country have resorted to innovative IT solutions after experiencing problems in the integration and storage of large amounts of information. However, the technology used in this sector is more service-oriented, and in this way they try to gain a competitive advantage. At the same time, the application of trending technologies in the field of finance is delayed and lags behind the world practice.

Based on the research results some proposals for national enterprises are as follows:

- With a special emphasis on cognitive technologies, well-thought-out strategies should be developed for the selection and application of the right technologies;

- With networks created using IT capabilities or “Cloud” technologies data should be managed from a single center, thus ensuring information security;

- Information systems development programs should be formed, Management Information System should be applied and execution of it at all levels should be ensured;

- In order to save resources and reduce bureaucracy, SAP type or more advanced software programs should be used in automating processes;

- IT professionals need to be trained by the enterprises (such as IBA Tech) and attract to job;

- Banks and other enterprises operating in the financial sector should expand the use of AI and blockchain technologies.

Thus, the results obtained and recommendations made in the application of technology in the management and construction of enterprises can contribute to the efficiency of enterprises.

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