

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ  
ІМЕНІ СЕМЕНА КУЗНЕЦЯ**

**ФАКУЛЬТЕТ МЕНЕДЖМЕНТУ І МАРКЕТИНГУ**

**КАФЕДРА МЕНЕДЖМЕНТУ, ЛОГІСТИКИ ТА ІННОВАЦІЙ**

Рівень вищої освіти  
Спеціальність  
Освітня програма  
Група

Перший (бакалаврський)  
Менеджмент  
Менеджмент інноваційної діяльності  
6.03.072.020.18.2

## **ДИПЛОМНА РОБОТА**

на тему: «Удосконалення чат-ботів як інноваційного інструменту  
взаємодії з клієнтами»

Виконала: студентка Юлія БОБРИЦЬКА

Керівник: к.е.н., доцент Тетяна СІГАЄВА

Рецензент: директор  
ПНВП «Укрполітехсервіс»  
Олексій ОСТАПЕНКО

Харків – 2022 рік

## РЕФЕРАТ

Дипломна робота складається з 56 сторінок; 11 столів; 5 рисунків; 39 джерел у списку літератури, розміщеному на 4 сторінках; 2 додатки.

Метою роботи є обґрунтування та подальший розвиток теоретичних положень та методичних підходів до вдосконалення чат-ботів як інноваційного бізнес-інструменту для спілкування з клієнтами та розширення рамок їх використання на підприємстві.

У першому розділі було розглянуто базове розуміння сутності та особливостей чат-ботів, але також були розглянуті їх основні функції, переваги використання на різних типах підприємств.

У другому розділі дипломної роботи проаналізовано організаційну структуру підприємства, проведено аналіз техніко-економічних показників. З метою дослідження предметної області було проведено комплексний аналіз використання чат-бота на підприємстві, проведено SWOT-аналіз чат-бота компанії.

У третьому розділі статті наведено пропозицію щодо використання чат-ботів для того, як здійснювалась комунікація з клієнтами, після того як за допомогою методології конкордації Кендалла була виявлена їхня наукова і розумна значимість, також була представлена економічна ефективність пропозицій. Для того, щоб продемонструвати важливість пропозиції, була розрахована її економічна ефективність.

Ключові слова: чат-бот, клієнт, комунікація, інновації, технології.

Рік виконання роботи 2022

Рік захисту 2022

## ABSTRACT

This thesis consists of 56 pages; 11 tables; 5 figures; 39 sources in the list of references placed on 4 pages; 2 appendixes.

The aim of the work is to equip and further develop theoretical positions and methodological approaches to improve chatbots as an innovative business tool of communication with customers and broaden the frameworks of their use at the enterprise.

The first section was a review of the basic understanding of the essence and features of chatbots, but their main functions, benefits of use at different types of enterprises also were considered.

In the second section of the thesis the organizational structure of the company was analyzed, also financial analysis and analysis of technical and economic indicators was performed. With a view to investigating the subject area, a comprehensive analysis of chatbot use at the enterprise was conducted, the SWOT analysis of company's chatbot was done.

In the third section of the paper, the proposal for the utilization of chatbots as how of communication with customers was done, once their scientific and sensible significance was evidenced with the assistance of Kendall's concordance methodology, finally, the economic effectiveness of proposals was represented. The economical effectiveness of thesis proposals was calculated in order to demonstrate the importance of the offer.

Keywords: chatbot, customer, communication, innovations, technology.

Year of work 2022

Year of protection 2022

## CONTENT

INTRODUCTION	6
1. THEORETICAL BASIS OF CHATBOT FORMATION	8
1.1. Essence and main business tasks of chatbots	8
1.2. Directions and benefits of using chatbots	14
2. COMPREHENSIVE ANALYSIS OF ACTIVITY OF LLC "NEBOZVID"	21
2.1 General characteristics of LLC "Nebozvid"	21
2.2. Analysis of technical and economic indicators of the activity of LLC "Nebozvid".	25
2.3. Analysis of the current use of chatbots in LLC "Nebozvid"	31
3. IMPROVEMENT OF THE USE OF CHATBOTS AT LLC "NEBOZVID"	33
3.1. The proposal for improving the use of chatbots as a way of communication with customers	33
3.2. Determining the scientific and practical effectiveness of thesis proposals	38
3.3. Evaluation of economic efficiency of chatbots use in the enterprise	42
CONCLUSION	45
LIST OF REFERENCES	47
APPENDIXES	51

## INTRODUCTION

In the 21<sup>st</sup> century, innovations turn a lot of attention from both sides of business and society. They play an important role in company development. Innovations help businesses in a lot of aspects such as finding and implementing of new business directions, creating new jobs and increasing the employment level, helping companies to promote themselves and access new markets , improve products and expand their fields of use, economizing costs of an enterprise and etc. Besides these, at the present stage of technological development, it is necessary to use modern automatized ways of business management. Communication with customers, scheduling, and cooperation inside the company could be fulfilled by bots, which will improve client satisfaction, decrease the costs for managerial and organizational work and ease the intercommunication in the company.

The Ukrainian and foreign chatbot industry has grown significantly in recent years. Both the number of projects and the volume of investments in them have increased. Such process able the market to take part in the innovations grounding and implementation in businesses by using chatbots.

Theoretical aspects of chatbots implementation have already been considered by numerous foreign researchers and authors as M. Almalki, S. Joshi, L. Jenneboer, C. Herrando, T.Hartono , K. McGarry and R.Khan as well as Ukrainian scientists represented by M.M. Novikova , O.A. Nebylytsia, N. A. Stefanova and M.O. Chuprina. Most of these papers underline the features of using chatbots as an innovative and effective toolkit for communication interaction and improving business processes, determine the advantages and disadvantages of chatbots in comparison with real communication, as well as conduct a review of existing chatbots experiences in different areas.

The purpose of the work is to substantiate and further develop theoretical principles and methodological approaches of improving chatbots as an innovative business tool of communication with customers and broaden the frameworks of their use .

To achieve the purpose it is necessary to solve the following tasks:

study and analyze the theoretical aspects of the introduction of the chatbot in companies and process the methodological basis for chatbots introduction;  
substantiate the role of chatbots in the communication with the customers of the company;  
analyze the features of different types of chatbots as well as their use in different business spheres and roles;  
to analyze the technical, economic, and financial performance of the researched enterprise;  
develop proposals for improving chatbots as a tool of business communication at the enterprise.

The object of the research is use of chatbots in the enterprise.

The subject of the research is the theoretical methods and approaches of chatbot implementation and the chatbots' effectivity for the business processes.

The basis of the diploma thesis is the fundamental works of domestic and foreign scientists on the use, effectivity and implementation of chatbots. To achieve a certain goal and objectives in the paperwork general and special research methods were used. The theoretical generalization was done to improve the concept of the use of chatbots; financial analysis was used to analyze the technical and economical indicators of researched enterprise.

The scientific novelty of the obtained results lies in the further development and improvement of theoretical and methodological provisions for the improving of the use of chatbots in the enterprise to simplify and cheapen its business processes.

## SECTION 1. THEORETICAL BASIS OF CHATBOT FORMATION

### 1.1. Essence and main business tasks of chatbots

Today, a chatbot is defined as a computer program, which conducts a conversation with the help of hearing or text methods. These are virtual interlocutors used in the dialog systems for various practical purposes, particularly customer service and information gathering. Mostly, modern chatbots are systems of scanning keywords at the entrance, selecting answers that coincide with the majority of keywords or the most similar to the formula template from the database. Some of the same virtual assistants use complex processing systems are some languages and are constantly improving. Discussing the essence of chatbots, it is important to note that there are different definitions and types of chatbots. To understand the chatbot's essence and tasks, it is necessary to review its basic constituent, namely the chatbot. The morphological analysis of the term "chatbot" is performed in tab. 1.1.

Table 1.1

The morphological analysis of the term "chatbot"

Author	Definition	Genus
1	2	3
S. V. Doshi [14]	A conversational agent where a computer program is designed to simulate an intelligent conversation. It can take user input in many formats like text, voice, sentiments, etc.	Conversational agent
M . Dahiya [13]	A program designed to counterfeit a smart communication on a text or spoken ground.	Program
A. M. Rahman [30]	An instant messaging account that can provide services using instant messaging frameworks to provide conversational services to users in an efficient manner.	Messaging account
B. Ranoliya [31]	A manufactured substance that is intended to reproduce a clever discussion with human accomplices through their regular language	Substance
P. Costa [12]	Mere assistants and their way of interacting brings them closer to users as friendly companions.	Assistant

The ending of table 1.1

1	2	3
A. Khanna [25]	A computer program, which responds like a smart entity when conversed with through text or voice and understands one or more human languages by Natural Language Processing.	Program
Gartner Glossary [17]	A domain-specific conversational interface that uses an app, messaging platform, social network, or chat solution for its conversations.	Interface
Investopedia [16]	A computer program that simulates human conversation through voice commands or text chats or both. Chatbot, short for chatterbot, is an artificial intelligence (AI) feature that can be embedded and used through any major messaging application.	Computer program

As it can be seen from the tab. 1.1, there are different points of view on the concept of chatbot. Most of the authors define it as a computer program that simulates human conversation through voice commands or text chats or both. which can change or add opportunities for different businesses. The essence of chatbots in different forms is excellently described in these definitions made by S. V. Doshi “chatbot is a conversational agent where a computer program is designed to simulate an intelligent conversation. It can take user input in many formats like text, voice, sentiments, etc. [14].”

The idea of the existence of the "thinking machine" was first advanced by the famous English cryptographer and mathematician Alain Turing in his famous article "Computing Machines and mind" (1950). He addressed the problem of artificial intelligence and offered an experiment, which was later known as a test of Turing. His idea was that one could think that the computer “thinks” if a person interacts with him, will not be able in the process of communication to distinguish the "car" from another person.

A. Turing suggested a hypothesis that instead of creating a program that simulates the mind of an adult, it is much easier to create the mind of a child first, and then teach it. Thus, in 16 years the first chat-bot of Elizabeth developed by Joseph Weizenbaum appeared in the world. The virtual interlocutor copied the behavior of the psychotherapist, highlighting



significant words and phrases of the interlocutor and asking counter questions. In 1995, the famous Alice, developed by Richard Wales, with the integration of the special (natural) language AIML. It is interesting to note that it is Elizabeth who became the first rule-based chatbot, which started the whole class of such systems. Without Elizabeth, there would be no such known programs as Cleverbot, WeChat, and even Siri, Jarvis, and Alexa. This gave rise to a whole class of such systems. [29].

Most modern bots are essentially an interface that provides access to the service (processing large data sets, etc.), and are used mostly on network platforms (messaging). Currently, most of these platforms have bot support, accessing their APIs (Application Programming Interface). For example, in Western countries it is Facebook Messenger and Kik, in China are WeChat and KakaoTalk, in Ukraine, there are Viber, Facebook Messenger, and Telegram. In addition, bots are used in Skype and Slack [2].

In developed countries, chatbots have been used by almost any company, performing ambiguous tasks:

- engaged in trading on exchanges;
- can help bring to life or make purchases;
- place orders in restaurants;
- buy, change and sell cryptocurrency;
- kept under control and embody in life systematic payments;
- give information about the work of the store or service.

More known script use bots are messengers. In this case, the bot is an interface through which the user can give commands. Questions can be as linear (question-answer), for example, or are solved in several steps, for example, selection of the necessary product in assortment and its subsequent order.

Nowadays, bots are fully ready to use their own experience of communication with a person or other different bots. Now bots are used for automation of routine processes and unloading of help services, it can be, for example:

1. Information search

2. Product selection
3. Decision on various requests from clients
4. Notification
5. Maintaining specific logos
6. Search for a specialist or a list of opportunities

Application of chatbots is topical on sites and in messengers, and also where there is a need for the quick response – automated analytical services. Due to the extensive possibilities of chatbots, it is possible to considerably expand the boundaries of communication, to make a replacement of live communication with the person with an artificial one with the bot.

Generalizing all modern chatbots' functionality, their tasks can be structured into three groups: performing routine operations (mechanical work that can be performed according to a specific algorithm), searching and aggregating data, dissemination of information, and the first line of interaction with clients (besides providing advice on goods and services, chatbots can concentrate and entertain the user. In terms of business objectives, there are only three main tasks that chatbots can perform [34].

1. Automation of communication with the client. A chatbot can automate messaging with the client in the form of a simple and convenient interface. The user can instantly get full information about the product (service), company, or brand, get answers to frequently asked questions, leave the application, write in support, etc.
2. FAQ automation. The chatbot can respond to a significant volume of standardized questions on a 24/7 basis.
3. Mailings. According to numerous studies and case studies of marketers and analysts, messengers have become the best channel of communication and delivery of content by the ratio of «efficiency-cost», showing results better than in other digital channels, such as e-mail and SMS.
4. Computation. Robots are great at compiling data and making it automatically digestible. Fast and reliable, bots can extract data from multiple sources and keep total

sales, inventories, and even contacts. Comparing sales figures for customers contacted through email versus social media versus the phone — and many other business analytics functions — can now be done automatically [37].

5. Customer relationship management (CRM). Bots are now designed to handle complex business-consumer relations. They can auto-capture customer data and make marketing efforts to attract new customers, 5-star reviews, and loyalty. Historically, managing customer information and using it to drive revenue for the business has been an arduous and time-consuming task, but now companies can turn to an automated marketing assistant [37].

By the all highlighted , there are various roles a person plays throughout the day and show how a person interacts with others in the ecosystem. The modes of communication in order to understand various use-case scenarios where chatbots can be deployed should be considered. The most common modes of communication in business are depicted on the figure 1.2.

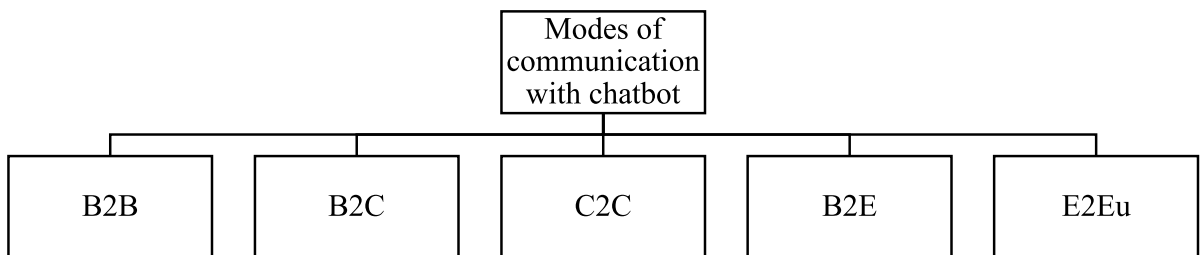


Fig. 1.2 Modes of communication with chatbot (compiled on the basis of [24])

### Business-to-Business (B2B)

A business typically interacts with other businesses in its domain or outside of its domain for multiple reasons. Chatbots in the form of digital assistants can be deployed in

such use cases, where the chatbot handles the communication for the business providing the products or services. The assistant provides information such as opening and closing times, location of offices, product information, contact information, and so on [24].

#### Business-to-Consumer (B2C)

In most cases, a business is directly providing its products and services to consumers. One of the most common examples of a chatbot for a B2C use case is an e-commerce chatbot. In some cases, consumers might be interested in other uses such as asking about pricing, registering a ticket for a product that was damaged or not delivered on time [24].

#### Consumer-to-Consumer (C2C)

People interacting with other consumers over chat would fall under this category. These are the conversations that are quite hard to automate, and chatbots at this point in time do not seem very useful. In selected scenarios, a chatbot might be employed to increase the quality of conversation. Such scenarios typically fall under a social shopping category [24].

#### Business-to-Employee (B2E)

In recent years, the channels through which a business can talk to its employees have opened. A lot of the interaction between the employees and the organization can be automated through chatbots. Popular applications include having a full-blown chatbot for HR-related queries that is plugged into the main HR system. Such chatbots reduce the back and forth when getting to know HR policies, requesting vacation time, and etc. [24].

#### Employee-to-Employee (E2E)

With the rise of technologies such as Slack, Skype for Business, and Microsoft Teams, employee-to-employee conversations have increased on the chat medium. These products provide support for bots out of the box, which means today there is a big opportunity for build applications that increase the productivity of employees in an organization [24].

That is why, there is no single sphere of activity in which chatbots could not be used: in banking, education and electronic textbooks due to the development of Internet

technologies new opportunities appear daily in the business area. Everyone can find out how to use chatbots within a company.

### **1.2. Directions and benefits of using chatbots**

In this internet era, every time a person requires a service or information, the person must find an appropriate website. In the mobile era, native apps took center stage with the same purpose as a website. Every business nowadays has one website and one mobile app at the bare minimum. Now, in the AI era, a customer is flooded with information on the website and the mobile app, and there aren't as many employees to help the many customers who are seeking the service or information. Moreover, even if a company finds many employees, the cost is very high. Conversational bots or chatbots are playing a pivotal role in the AI era by addressing the critical problem of information deluge at an affordable cost [33].

The organization is going through a digital transformational journey where chatbots are being discussed in roadmaps. The primary objective is to improve customer experience through simplified touchpoints and faster service time. This objective often results in higher conversion for newer products and services and reduced cost of operations.

The massive growth of bot frameworks (technology) and advancements in natural language understanding (AI) has led to the adaption of chatbots in many industries. Companies are building chatbots across the lifecycle of their customers, namely: acquisition, engagement, servicing, and feedback.

Acquisition and engagement help companies build a strong top line for the business while servicing helps in reducing cost and feedback increases customer retention [33]. Table 1.2 shows an industry-wide adaption of chatbots and various use-cases.

On the table, it can be seen that chatbots are already actively used in almost all commercial spheres as the insurance and financial services, healthcare services, retail, travel, and telecommunications.

Table 1.2

An industry-wide adaption of chatbots and various use cases [33]

Industry	Use-cases of chatbots
Insurance	Underwriting
	Automated advisory
	Claim
	Coverage queries
Financial services	Account management
	Product guidance
	Predictive offers
	Market updates
	Online subscription managements
Healthcare	Discovery and scheduling
	Care management
	Drug information
	Diagnosis test appointments
	Assist non-emergency patient queries
Travel	Automatic flight reminders and updates
	Virtual AI travel agent
	Book hotels, cabs, and restaurants
	Suggest sight-seeing
Retail	Product search in supermarts
	Recipe search
	Locate nearby stores
	Order food
Telecommunication	Billing and accounts services
	Offers and plan changes
	Customer support and self-service
	Training and operations productivity

The detailed description of the table :

1. Insurance. Insurance activities involve a lot of back and forth between the customer and the insurance company. The data that is exchanged between the two parties for most of the interaction is structured and can be automated. Some of the use cases where we have seen the adoption of chatbots in the insurance domain are registering an insurance claim, finding out the status of a claim, and getting information about other insurance products [22].

2. **Travel: Booking Bots.** Travel is a big market where a lot of customer interaction takes place before a sale is made. Companies such as Skyscanner and Hipmunk provide real-time prices of flights and hotels. One use case would be to integrate and build a chatbot that talks to a couple of back end to get flight and hotel pricing and keeps tabs on all the prices. Another use case that can be integrated into a chatbot is that of recommending places to visit or see while on a vacation [22].
3. **Food and Restaurant.** There are simple-to-use and simple-to-build use cases, and we urge you to try building one of the chatbots described in this section. One of the major categories of queries for the food industry is related to table reservations; even today most table reservations are handled over a phone. A chatbot seems like a good fit for this problem; it could be convenient to access a chatbot and book a table for any number of people while on the go [22].
4. **E-commerce.** In the use cases for e-commerce, there are primarily two functions that a chatbot can perform: product search and customer. Automating customer support for e-commerce is a huge market, and with the advances in the language understanding of computers, soon all customer support queries will be handled by automated systems [22].
5. **Healthcare.** There are countless cases where a digital personal assistant or a chatbot could help physicians, nurses, patients, or their families. Better organization of patient pathways, medication management, help in emergencies or with first aid, and offering a solution for simpler medical issues: are all possible situations for chatbots to step in and ease the burden on medical professionals. In some cases, health bots can also connect patients to clinics for diagnosis or treatment, but this is one step. The general idea is that in these clever algorithms conversations or text messages can be the first point of contact for primary care. Patients will not contact doctors, nurses, or any health care provider with any questions about their initial health before chatbots. If the little medical assistant can't comfortably answer the question, he will refer the case to a real doctor [35].

So, tasks that were earlier thought to be possible only by humans are now getting automated. Such innovation brings the cost down and helps in achieving scale. Various industry reports were highlighted to prove the benefits of using AI-driven chatbots in an industry.

#### Benefits from Chatbots for a Business

According to the Grand View Research 2018 report, the global chatbot market is expected to reach \$1.25 billion by 2025, with a CAGR of 24.3% (average annual growth rate). The chatbot market will grow significantly across the financial services sectors, as they are among the largest customer-facing businesses (in our context, the insurance business) [11]. The immediate value creation for institutions happens by significantly reducing the operating cost and bringing customer satisfaction [33]:

1. 24x7 availability. Chatbots are available 24x7 through phones or the Web. This gives the customer options of when to interact with the services.
2. Zero human touch experience: Chatbots allow customers to have a zero human touch experience for their basic requirements. This way of getting the necessary information without going through the manual route is entirely new.
3. Simplicity. Chatbots simplify the process for customers by decoding the process into clear steps. The information delivered by chatbots is also very concise and to the point, as per the customer query.
4. Cheapness. It is more cost-effective for companies to use chatbots than to hire human resources. Like humans, various chatbots can perform a wide range of tasks, from simpler advice to even shopping and ordering on behalf of customers in doing all this, chatbots never get tired or sick. Thus, they do not require paid leave, sick leave, and surcharges for night shifts, unlike human workers.
5. Instant response, absence of queues. Chatbots quickly produce accurate answers. It takes less than seconds to match the requested information with the knowledge base and generate a result. They do not spend too much time thinking, searching, remembering, and opening many browser tabs. Moreover, chatbots can have many



dialogues at the same time, so customers do not have to wait in line for what they hate to do. Quick response to the request provides a great user experience [28].

While chatbots might find a favorite in providing round-the-clock assistance to simple questions, they're less trusted for more complex issues. That's according to a report from Drift, SurveyMonkey Audience, and Salesforce which surveyed 1,051 US adults from 18 to 64 years [26]. The results of the report are performed in figure 1.1.

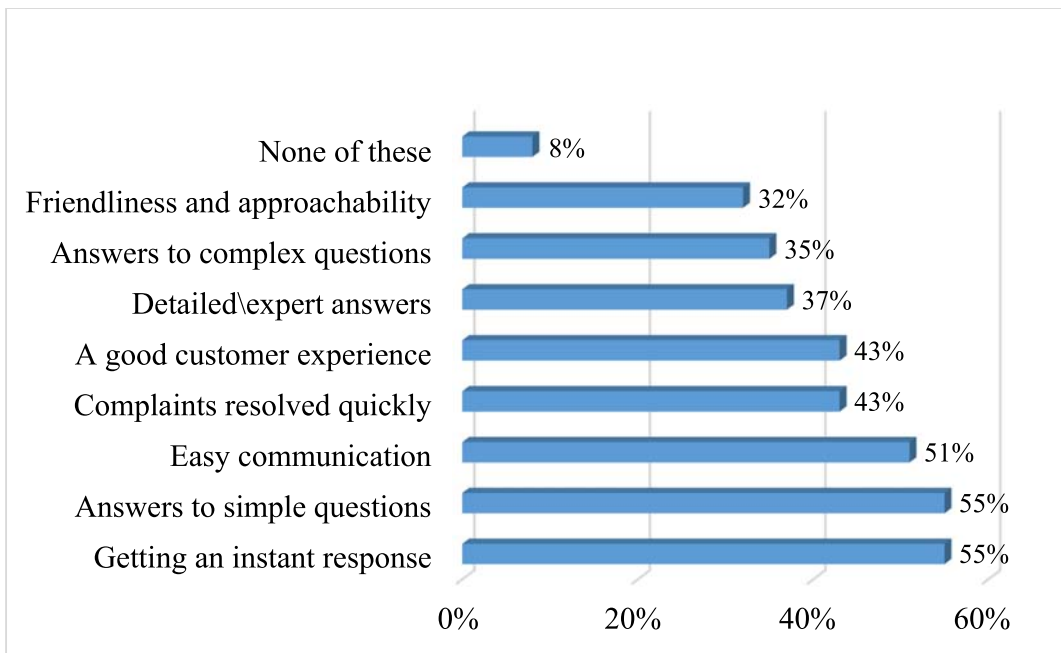


Fig. 1.1 The benefits of chatbots by a survey of MarketingCharts.com [26]

Nonetheless, chatbots which are increasingly being used by Fortune 500 companies do have benefits in consumers' eyes [26].” For example, more than 1 in 3 respondents predict that they would use a chatbot for a variety of tasks, including getting a quick answer in an emergency (37%), resolving a complaint or problem (35%); and getting detailed answers or explanations (35%). Moreover, were chatbots to be available and working effectively for online services used by respondents, a majority would expect to enjoy potential benefits such as 24-hour service (64%), getting an instant response (55%), and answers to simple questions (55%).

As the report’s authors note, “consumers see chatbots as being able to provide that real-time, on-demand experience that they’ve been craving [26].”

Even if the bots play an important role in communicating with clients, and some of the simple monotonous tasks are left to them, they are not able to solve all of them. There are numerous disadvantages of using chatbots for business, that were obtained with a survey, which was conducted and described in the Chatbot report 2019.

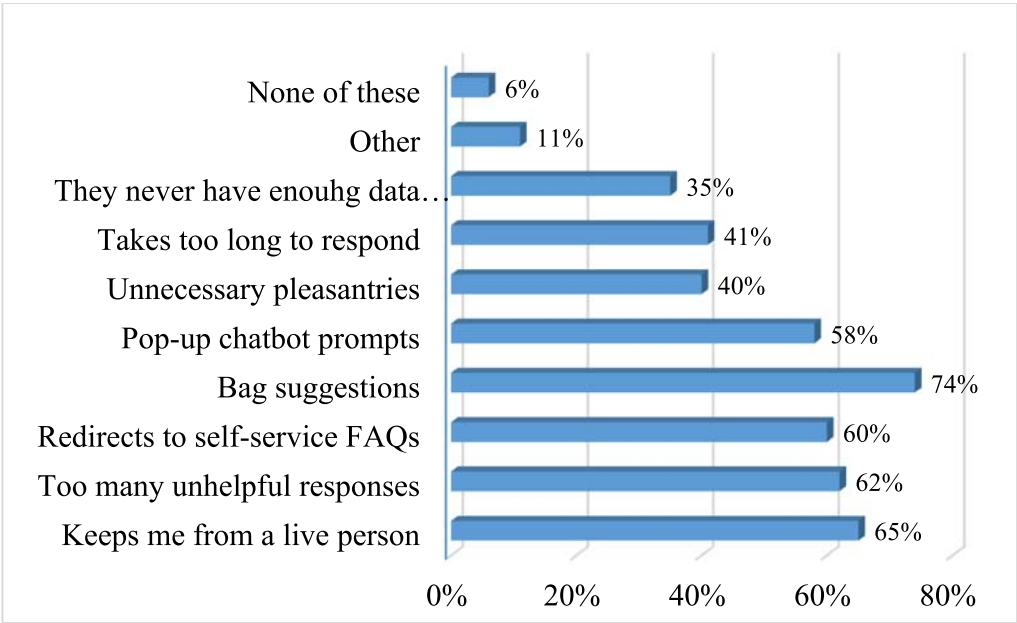


Fig.1.2 The Predicted Usage Cases of Chatbot [Ошибка! Источник ссылки не найден.]

According to the survey the most popular challenges which the consumers face when they interact with chatbots in the majority of spheres were described:

1. The main disadvantage of chatbots is the inability to act in an unusual situation. People in conversation with a bot can express themselves allegorically, giving words a double meaning. It turns out that the chatbot copes well with simple questions, giving quick and clear answers, but to respond correctly to humor, sarcasm or irony is difficult even for bots with artificial intelligence [32].

2. Inability to improvise. Chatbots do well as long as the situation is within the programmed. However, no developer can participate in millions of possible nuances, so the behavior of the interlocutor, beyond the template, often confuses the bot with that. The program repeats the same words several times. As a result of the placement, the client leaves the site or applications without the information he needs [39].
3. Chatbots will not be common in all business areas. It has successfully established itself in the use of chatbots in areas such as food delivery, hotel reservations, e-commerce, airline tickets, taxis, and other services, where most customer requests are expected. Content with these many B2B companies is forced to provide extensive individual advice and respond in a certain way during the conversation, so as not to dismiss the client and satisfy all his wishes.
4. Clients are more preferred to communicate with live people. Live customer service staff increase the customer satisfaction rating. Users prefer to resolve issues with people since the bot cannot always give an intelligible answer, which means it is useless. People prefer to deal with a real person because it is easier to build a relationship with him.

In summary, a chatbot is a necessary and widespread technology that greatly facilitates communication between customers and business companies. Today, bots have their drawbacks, but this is a promising industry that is constantly evolving, improving the quality of work. Therefore, before using a chatbot, evaluate all the pros and cons of working with this program to see if it is specific to your work.

As for the conclusion to the section, it should be stated that in this section the analysis of the development, essence and main business tasks of chatbots was conducted, all directions of using chatbots were described and the analysis of the advantages and disadvantages of chatbots was performed to prepare for the next chapter of the paper and find out the role and specifics of the implementation of chatbots in different business spheres.

## **COMPREHENSIVE ANALYSIS OF ACTIVITY OF LLC "NEBOZVID"**

### **2.1. General characteristics of LLC "Nebozvid"**

Nebozvid LLC is one of the founding members of Kharkiv's private medical services industry. It all started in 1992, when a group of ambitious entrepreneurs, largely medical practitioners, founded the first dental content clinic, which quickly rose to the top of the industry. The clinic's creators, however, did not stop there. The main principle they were guided by in their activities was simply to declare themselves, it is necessary to constantly improve, confirming in word and deed the high status of the company.

This approach allowed the clinic to develop further, and in 1996 it grew into a full-fledged medical center, consisting of dental, medical and diagnostic, cosmetic centers, and emergency departments at home. Nebozvid LLC is located in a separate three-story building in the city center. The clinic is open for seven days, and the emergency department is open 24 hours a day. A certificate of the highest level of accreditation serves as proof of Nebozvid LLC's great service quality. More than 70 doctors currently work here, and over 30,000 patients, both people, and groups, visit us each year. Treatment and inspection alternatives are available for both those and others in the center. Furthermore, Nebozvid LLC has a long and profitable relationship with several insurance firms in Ukraine and the CIS.

Nebozvid LLC is currently one of Kharkiv's most well-known private clinics. The medical center's key benefits are highly qualified professionals who employ the most effective methods in their work, a powerful diagnostic foundation, current technology, and the option of a full evaluation and treatment. It has the undeniable advantage of having all of the institution's work automated. Nebozvid LLC is a certificate of the highest value of accreditation, demonstrating the high quality of services offered by MC. Nebozvid LLC currently employs over 70 doctors and yearly treats over 30,000 patients, including individuals and companies. Treatment and inspection alternatives are available for both those and others in the center. The Nebozvid LLC interdisciplinary medical and diagnostic

center's Emergency Medical Service is a structural subdivision. The unit is staffed by highly qualified doctors and paramedics with years of expertise.

The emergency service is provided with everything necessary to provide qualified medical care to adults and children. Highly qualified specialists are the most important dignity of the emergency medical service of Nebozvid LLC. All cars on equipment and the layout of the salon correspond to a class "C" of sanitary motor transport (resuscitation cars).

Enterprise management's organizational structure aids managers in achieving their objectives. The strong relationship between strategy and structure makes sense because the goals are drawn from the overall strategy of the company. As a result, the organizational structure must adhere to a specific plan. And, if managers are making significant changes to their organizational strategy, they must adapt and sustain these changes by changing the organizational structure. The enterprise management system is created based on the organizational structure.

The organizational structure of enterprise management outlines the required number of management staff, distributes it by units, regulates administrative, functional, and informational relations between management staff and units, establishes rights, responsibilities, and responsibilities of managers, and so on.

It should be can be deduced that this model is linear-functional based on the company's structure. The vertical distribution of authorities and responsibilities for management activities and decision-making is part of the linear-functional organizational structure of management. Simultaneously, management is organized linearly, and functional units of the management staff assist line managers in resolving management issues.

LLC Nebozvid provides services to clients with variable medical services, therefore it has ramified organizational structure, which consists of numerous different branches and subdivisions. The organizational structure of Nebozvid LLC is fully represented in Fig. 2.1.

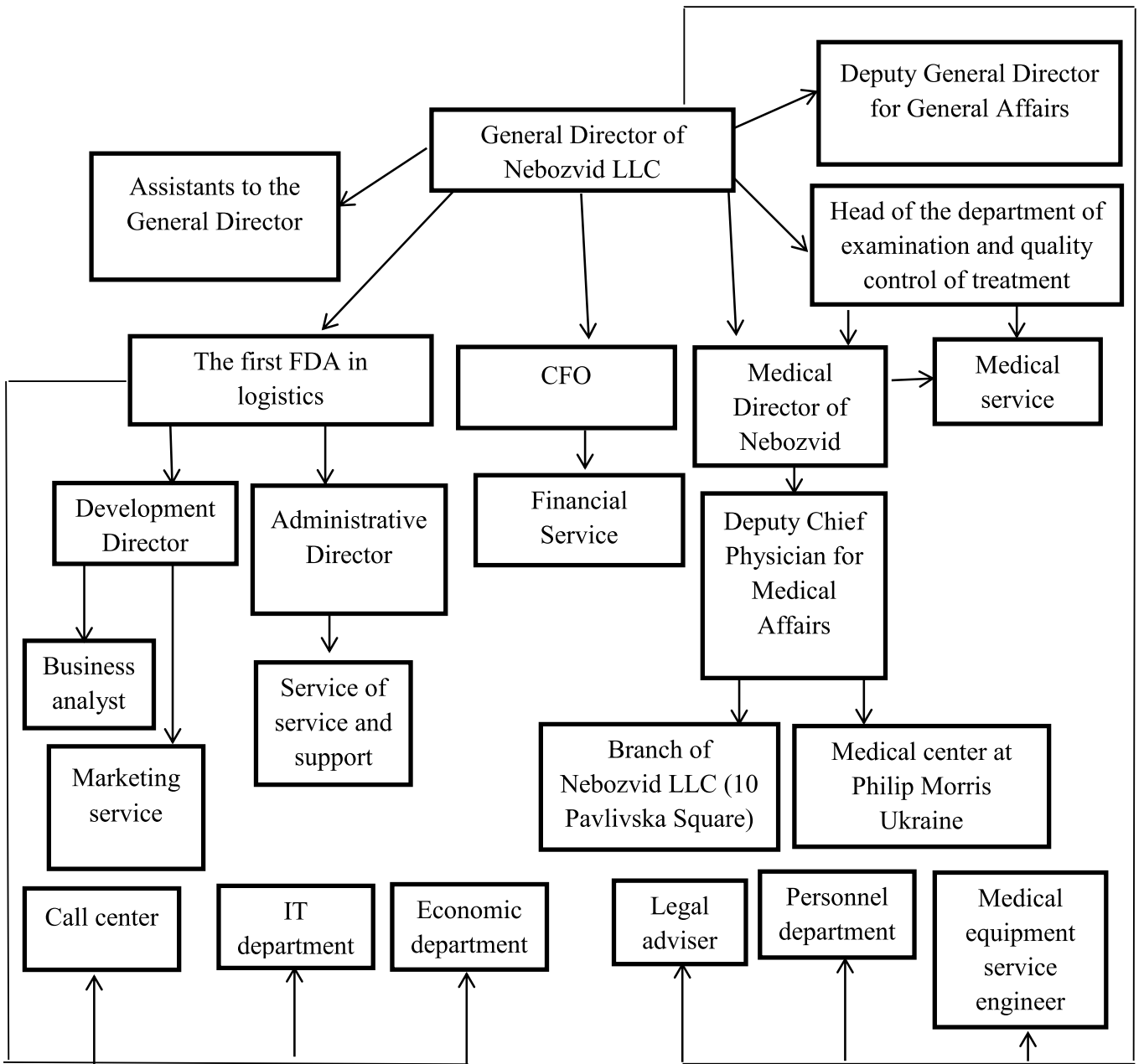


Fig. 1.1. The organizational structure of LLC Nebozvid

LLC Nebozvid provides services to clients in the following medical directions: family medicine, multidisciplinary diagnostic center, cardiology, gynecology, ENT, blood purification, surgery, laboratory, hospitalization center, mother and child health center, dentistry, and ambulance.

It is also important for the company to analyze internal and external elements, as well as assess risks and competitiveness of goods (services), which can be accomplished through SWOT and TOWS analysis in tables 2.1 and 2.2.

In the market, each organization (business) has distinct benefits and disadvantages. The SWOT analysis identifies the company's strengths and weaknesses that require the most attention and effort.

Table 2.1

SWOT analysis of LLC "Nebozvid"

Strengths	Weaknesses
<ol style="list-style-type: none"> <li>1. State-of-the-art medical equipment;</li> <li>2. Highly qualified personnel. This gives the department a positive image as experts in their area (the opportunity to sell services using phrases like "reliability" and "experience");</li> <li>3. Possession of cutting-edge surgical treatment technologies that have the most beneficial impact on patients.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ignorance in full of residents of Kharkiv, region, and other regions of Ukraine about all the possibilities of the department and its benefits;</li> <li>2. There is insufficient coordination of the patient's engagement with department employees on calls, consultations, and notably the hospitalization algorithm.</li> </ol>
Opportunities	Threats
<ol style="list-style-type: none"> <li>1. The degree of advancement of research and treatment techniques used throughout the world, as well as their application in the department.</li> <li>2. Market share increased owing to a solid reputation</li> </ol>	<ol style="list-style-type: none"> <li>1. The outflow of patients with musculoskeletal problems seeking treatment in other parts of Ukraine or overseas; self-medication with pharmaceuticals that worsen the disease's severity.</li> <li>2. Rising skepticism of domestic medicine and the domination of treatment abroad</li> <li>3. Private clinics face fierce competition.</li> </ol>

Based on the SWOT analysis, the following conclusions can be done:

the department has a strong potential to provide medical care at a high professional level;

the serious threats that affect the work affect the work of the department, it is very difficult to level the degree of this impact at the expense of opportunities.

Therefore, one of the tasks of promoting the services of the department may be the transition to public-private medicine or the creation of an alternative partner clinic in another area or a subsidiary medical institution. Thus, the conclusions obtained as a result of the SWOT analysis on the strengths and weaknesses of the company and their impact on the implementation of opportunities and prevention of threats. The study identified the necessary areas of action, including strengthening customer focus and introducing marketing tools in the activities of both the department and the entire hospital.

### **Analysis of technical and economic indicators of the activity of LLC "Nebozvid".**

The main task of technical and economic analysis is to show the dynamics of changes in the main indicators of the enterprise for the last two years (2020 - 2021). The feasibility study reflects the change in indicators in absolute and relative terms. The analysis is performed concerning the previous period, ie 2021 is compared with 2020.

The calculation of indicators of resource efficiency and the level of profitability of production and economic activities of the enterprise are given in the table. 2.2.

Table 2.2

The main technical and economic indicators of the "NEBOZVID" LLC

№	Indexes	Units of measurement	Period		Change	
			previous year	reporting year	in abs. expressions	%
1	2	3	4	5	6	7
1	The volume of marketable products excluding VAT at current prices	th. UAH	18964	28283.2	9319.2	149.1
2	Revenue from sales of products without VAT at current prices	th. UAH	17240	25712	8472	149.1
3	Cost of goods sold	th. UAH	11752	16712	4960	142.2
	including					



continuation of table 2.2						
3.1.	basic wages of major workers	th. UAH	65580	65760	180	100.3
3.2.	Administrative expenses	th. UAH	22230	3896	-	-
3.3.	Selling expenses	th. UAH	2964	4323	-	-
4	The average number of employees	persons	1093	1096	3	100.3
	including by categories:					
4.1.	major workers	persons	748	738	-10	98.7
4.2.	support workers	persons	19	18	-1	94.7
4.3.	specialists, employees	persons	215	225	10	104.7
4.4.	administrative and managerial staff	persons	111	115	4	103.6
5	The number at the beginning of the period	persons	1093	1096	3	100.3
6	Employees are accepted	persons	297	250	-47	84.2
7	Workers left	persons	302	214	-88	70.9
	including	persons				
7.1.	due to staff reductions	persons	-	-	-	-
7.2.	voluntarily	persons	85	137	52	
7.3.	for violation of labor discipline	persons	-	-	-	-
8	The number at the end of the period	persons	1096	1096	0	-
9	Remuneration fund	thousand UAH	10544.8	13866.7	3321.9	131.5
10	Working time fund	year	1848480	2088291	239811	113.0
11	Profit from sales	thousand UAH	9500	9400	-100	98.9
12	The value of fixed assets (VFA) at the beginning of the period	thousand UAH	2833.9	11200	8366.1	395.2

If the company has planned data indicators, it is necessary to analyze the level of implementation of the plan in the reporting period and the dynamics of indicators compared to the previous period.

The level of implementation of the plan in absolute terms is equal to:

$$\Delta PI = V_a - V_b \quad (2.1)$$

where  $\Delta PI$  – the implementation of the plan in absolute terms;

$V_a$  – the actual value of the indicator;

$V_b$  – the basic value of the indicator.

Calculation of the percentage of plan implementation, growth rates, and growth rates in absolute and relative terms.

The growth rate of the indicator is calculated by the following formula:

$$Gr = \frac{V_a}{V_b} * 100\% \quad (2.2)$$

where  $Gr$  – the growth rate,%;

$V_a$  – the actual value of the indicator;

$V_b$  – the value of the indicator in the previous period (baseline).

The rate of increase is calculated by the following formula:

$$Ir = \frac{V_a - V_b}{V_b} * 100\% , \quad (2.3)$$

where  $I_r$  – the rate of increase, %;

$V_a$  – the actual value of the indicator;

$V_b$  – the value of the indicator in the previous period (baseline).

For a more detailed analysis of the enterprise it is necessary to calculate the following indicators: labor productivity, return on capital, material consumption, capital efficiency, capital intensity, costs per 1 UAH of marketable products, profitability of production.

Productivity is the efficiency of the use of resources: labor of capital, land, materials, energy, and information - in the production of various goods and services. It reflects the relationship between the quantity and quality of goods produced or services provided and the resources spent on their production.

Productivity is determined by the following formula:

$$P = \frac{V}{N} \quad (2.4)$$

where  $P$  – labor productivity, thousand UAH / person;

$V$  – volume of marketable products, thousand UAH;

$N$  – the average number of employees persons.

Material return is the ratio of the value of output to the number of material costs. This indicator characterizes the return on materials, i.e. how many products are produced from each UAH of used material resources (raw materials, fuel, energy, etc.). The following formula is used for calculation:

$$R_m = \frac{C_m}{C_o} \quad (2.5)$$

where  $R_m$  - material return, UAH / UAH ;

$C_m$  - the number of material costs, thousand UAH;

$C_o$  - the cost of output, thousand UAH.

Material consumption shows how much material costs account for the production of a unit of output. The calculation of material consumption of the enterprise is carried out according to the formula:

$$MC = \frac{C_o}{C_m} \quad (2.6)$$

where  $MC$  - material consumption, UAH / UAH;

$C_m$  - the number of material costs, thousand UAH;

$C_o$  - the cost of output, thousand UAH.

The most generalizing indicator of the use of fixed assets is the return on assets, which is determined by the ratio of output to the value of fixed assets:

$$Ra = \frac{FA}{V_p} \quad (2.7)$$

where  $Ra$  - return on assets, UAH / UAH;

$V_p$  - the volume of marketable products, thousand UAH;

$FA$  - the average annual value of fixed assets, thousand UAH.

Capital intensity - an indicator, the inverse of the return on assets, it characterizes the value of fixed assets per 1 UAH product and is calculated by the following formula:

$$CI = \frac{1}{Ra}$$

(2.8)

where CI- capital intensity, UAH / UAH;

Ra - return on assets, UAH / UAH

Costs per UAH of products are defined as the ratio of planned or actual costs of production to its value in the comparative prices of the enterprise. The calculated technical and economic indicators of the enterprise are presented in table 2.2.

Table 2.2

#### Basic technical and economic indicators

№	Indexes	Units of measurement	Period		Change		
			2019	2020	in abs. expression (+, -)	%	% of change
1	productivity	UAH / person	17.35	25.81	8.46	148.73	48.73
2	return on capital	UAH / UAH	0.33	0.25	-0.08	76.85	-23.15
3	material consumption	UAH / UAH	3.05	3.97	0.92	130.12	30.12
4	return on assets	UAH / UAH	2.70	1.68	-1.02	62.32	-37.68
5	capital intensity	UAH / UAH	0.37	0.59	0.22	160.46	60.46
6	costs per 1 UAH of marketable products;	UAH / UAH	0.68	0.65	-0.03	95.35	-4.65
7	profitability of production, products.	%	80.84	56.25	-24.59	69.58	-30.42

From the technical and economic analysis, it can be concluded that labor productivity decreased in 2021 by UAH 8.46 / person (or 48.73%) compared to 2020. Return on assets

decreases in 2021 by UAH 1.02 ./грн. (or 37.68%) compared to 2020, which indicates a deterioration in the use of fixed assets. Capital intensity increases in 2021, it increased by UAH 0.22 / UAH. (or 60.46%) compared to 2020, which indicates a deterioration in the use of fixed assets. In 2021, the profitability of products decreased compared to 2020 by 24.59 (30.42%), the reason is that in 2021 the company reduced profits.

### **2.3. Analysis of the current use of chatbots in LLC "Nebozvid"**

To analyze and solve problems of various kinds, including economic ones, modern information technologies offer a wide range of decision-making tools - human-machine interactive systems that allow decision-makers to use data, knowledge, and objective or subjective models [19].

Currently, the LLC "Nebozvid" is one of the most famous private medical institutions in Kharkiv. Highly qualified specialists, effective techniques, a powerful diagnostic base, modern equipment, and the possibility of a comprehensive examination and treatment are the main advantages of the Evviva Medical Center owned by the LLC "Nebozvid" [27]. The entire medical and diagnostic process that takes place within the walls of one building is also grounded by the implemented chatbot, which helps to create an appointment with an appropriate doctor and get information about the center and its schedule.

One of the reasons for the growth of the market for the use of chatbot technology, experts believe, is the further integration of bots with social networks and messengers to improve interaction with customers and increase the level of services provided and accelerate the work of operators [3; 6]. The same reason had the creation of the chatbot in the medical center "Evviva", the main function of which is client support.

The chatbot, implemented by the famous Ukrainian medical center "Evviva" owned by the LLC "Nebozvid" was analyzed and the SWOT analysis was drawn up in table 2.3. The chatbot in an app and Viber was used by several people to understand all its strengths and weaknesses and conduct the correct SWOT analysis. This chatbot is a quite useful helper to get the meeting with the doctor arranged. But, unfortunately, it is the only function.

Generally, chatbots can not only sell by generating invoices and answering standard user questions but also can create a schedule for employees as well as patients, computation, etc. The detailed analysis of the "Evvivabot" is done in table 2.3.

Table 2.3

SWOT analysis of the chatbot created by "Evviva"

Strengths	Weaknesses
<ol style="list-style-type: none"> <li>1. Chatbots are a trend at their peak, for the buyer their presence has become the norm, but the absence can be regarded as an obvious lag of the seller.</li> <li>2. The functionality allows you to use the program both for organizing internal work and for communicating with patients outside.</li> <li>3. A well-done chatbot makes life easier for the client - increases his loyalty to the brand.</li> <li>4. The patient can arrange a meeting with the doctor anywhere and anytime.</li> </ol>	<ol style="list-style-type: none"> <li>1. Like any program, it will constantly require improvements (otherwise, the buyer is leaving for more technically advanced competitors).</li> <li>2. The simple bot is deprived of most of the demanded functions so it has bugs sometimes, and unique complex programs with a good list of settings cost a lot of money.</li> <li>3. Unattractive bot interface and it is not comfortable to use.</li> <li>4. Only people, who downloaded the app or have Viber or Telegram have access to the bot.</li> <li>5. You do not have confirmation that your visit is recorded by the clinic.</li> </ol>
Opportunities	Threats
<ol style="list-style-type: none"> <li>1. To collect statistics.</li> <li>2. To conduct surveys.</li> <li>3. To send out personalized offers (based on the analysis of collected customer data).</li> <li>4. To work simultaneously on several social networks.</li> <li>5. To provide a discount, assign clients the status of permanent and divide them into groups (by order volume, frequency of purchases, geolocation).</li> </ol>	<ol style="list-style-type: none"> <li>1. The main threat posed by a chatbot is misconfiguration. Because of it, users can go to competitors.</li> <li>2. If the chatbot simply does not have enough functionality for a customer, he will not make a purchase decision.</li> <li>3. App default.</li> </ol>

The analysis of the main strength and weaknesses of chatbots in the example of "EvvivaBot" was represented to have a possibility of efficient procedure of chatbot implementation for other business purposes. Therefore a lot of additional functions that the chatbot of the clinic could perform will be proposed and some changes that should be done to increase the efficiency of the chatbot will be described.

## **SECTION 3. IMPROVEMENT OF THE USE OF CHATBOTS AT LLC "NEBOZVID"**

### **3.1. The proposal for improving the use of chatbots as a way of communication with customers**

To determine the measures which should be implemented to improve the communication with customers by the means of chatbots, the main disadvantages of its use should be counted.

First of all, the chatbot introduced by medical center "Evviva" has only informative function that make it ineffective knowing the variety of tasks could be performed. Chatbots are classified based on the primary goal they aim to achieve.

Informative chatbots are designed to provide the user with information that is stored beforehand or is available from a fixed source. Usually, they are information retrieval algorithm-based and would either fetch the result of a query from the database or would perform string matching. Most of the time, they will refer to a static source of information such as site's FAQ page or a warehouse database with inventory entry [21].

Despite this, the "EvvivaBot" does not store any information for the patients and customers of the medical center besides several buttons, that can redirect the user to have a call to call centers, to write a message in Telegram or Viber which will be answered within 1 hour by the employee who is responsible for the customer support because of the absence of a conversational chatbot.

So, there are 2 main issues that should be improved to increase the effectiveness of chatbot and the level of the customers' satisfaction. Firstly, the existing informational chatbot, which is named "EvvivaBot" should be improved and perform all its functionality. Secondly, the conversational chatbots in messengers such as Viber and Telegram instead of chatting with alive employees should be created and set according to the possible inquiries of customers.



In order to understand how the functional of the "EvvivaBot" can be improved, it was decided to compare the functions can be fulfilled by simplest informational chatbot and "EvvivaBot" table 3.1 is created.

Table 3.1

The comparison of function "EvvivaBot" with the possible functions of an informational chatbot

Function can be performed	"EvvivaBot"
Provide basic information about medical center, working time, doctors and etc.	+
Track the "live" schedule of each doctor and show the time available for an appointment.	+
Have a database of possible symptoms and the first aid or sequence of actions that could or mustn't be done before appointment with the doctor	-
When chatbot is available in the app, the own inner app chat should be used for the case if customer does not have Telegram or Viber messengers.	-
Store the information about latest appointments, personal data of customer, the doctor's prescriptions and the disease history of the patient.	-
Leave the questions for the attending physician before the next offline or online consultation.	+
Attend the online consultation with the doctor in the app.	-
Redirect to the payment page and store the payment history.	+
Redirect to the call center or customer support.	+

So, according to the comparative table the "EvvivaBot" performs 5 out of 9 functions it could do. Due to the comparison the actions to improve the effectiveness of the chatbot for "Evviva" medical center are listed:

1. The chatbot should have an extensive directory of trusted health care information to provide relevant responses to all user requests. Such a database will help the patients to define the specialization of the doctor they need an appointment with and provide people with the information which symptoms require immediate attention and which can be delayed for the nearest time.

2. The chat implementation into the app. The chat can become not only a means of communication between the customer and manager or doctor. Through it, prescriptions tracking, reminders about doctors' vacations, and sick leaves for patients, the appointment of urgent visits might be performed. Another reason for the chat introduction is the probability of the absence of other messengers (Viber and Telegram) via which the communication with the clinic is performed.
3. Creating the automatically updated folder with doctors' prescriptions for the patient. The folder should be connected to the clinic's database to refresh the prescription instantly as it is created by the doctor. This step may decrease the managers and doctors' assistants workload as fewer patients will inquire to remind the prescription or interpret the name of the medicine.
4. Introducing the possibility to schedule and perform an online consultation with a doctor. John Hopkins medicine department wrote: "To help prevent the spread of COVID-19, flu and other infectious diseases, doctors can use telehealth appointments to prescreen patients for possible infectious disease. It also saves sick people from having to come in to the office. Less exposure to other people's germs helps everyone, especially those who are chronically ill, pregnant, elderly or immunocompromised" [20].

To get all the proposals done, the "EvvivaBot" will perform all its functionality and will decrease the workload of the support staff of the clinic. Besides "EvvivaBot", the clinic has profiles in two messengers as Viber and Telegram as a way of communication with the customers. These profiles are led and answered by alive people. This takes a lot of resources from the company as well as the time of waiting for the answer in the messengers is much longer than the time spent with the chatbot.

To solve this issue, conversational chatbots for two messengers should be implemented. These bots talk to the user, like another human being. Their goal is to respond correctly to the sentence they've been given. Hence they are often built with the

purpose of continuing conversation with the user based on techniques like cross questioning, evasion, and deference [21]. Example: Siri, Alexa, Jenny, Tay, Xaoice [8]. Such type of chatbots is the most suitable for B2C mode of communication, as it handles the communication for the business providing the answer on the frequent questions about the products or services[23].

The scheme of working of the simple conversational helps to consider the main classification methods that can be used for chatbot depending on the business needs. The scheme of work of the simple chatbot is shown on the figure 3.1.

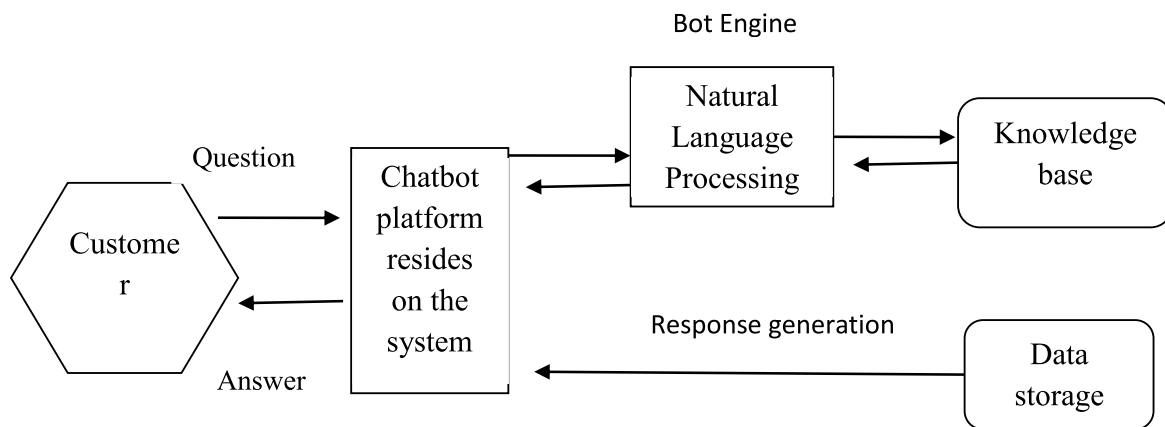


Fig.3.1 Scheme of work of simple chatbot [7]

In General, a Chatbot works on three classification methods [7]:

1. Pattern Matching.

Chatbots make use of pattern matching techniques in which they first group the text and then produce a relevant response from the clients. Artificial Intelligence Markup Language (AIML) is a typical structured model to create human interfaces for the implementation of pattern that can simply understand and get back with a suitable response from the clients.

2. Natural Language Understanding.

Natural Language Understanding (NLU) directly allows a human-computer interaction, NLU is assigned to communicate with untrained individuals and to understand their intent, which means that NLU goes far beyond understanding words and interpreting the meaning. NLU is even programmed with the ability to understand the meaning of the phrase in spite of common human errors like mispronunciations or interchanged letters or words.

### 3. Natural Language Processing.

Natural Language Processing (NLP) is the technology used to assist the computers to understand the human's natural language. It is similar to teach a computer that how humans communicate, which is not an easy task to perform. It is a branch of artificial intelligence that deals with the interconnection between computers and humans using natural language. The eventual objective of NLP is to read, decode, understand, and to make sense of the human languages in a manner that is worth it.

According to the classification methods of the chatbot, counting the type of chatbot and B2C mode of communication , which is required for a such type of business, as healthcare, Natural Language Understanding (NLU) is preferable classification method for the chatbots in both messengers, as the clients of different age groups may ask the chatbot questions about their symptoms , health issues or appointments. So the meaning of the written must be understood properly.

To sum up, in this subchapter, the proposals for improvement and specifics of the work of chatbots in the activity of healthcare institution were determined and described. Also, it was specified about features of chatbot development and creating for different business purposes. This chapter also overed the design principles of a chatbot, which should be considered when building a successful chatbot.

### **3.2 Determining the scientific and practical effectiveness of thesis proposals**

The improvements proposed in the previous subchapter to increase customer satisfaction and chatbot efficiency might be justified by counting the survey of 3 experts in the researched sphere. The experts considered how the proposal can influence the experience of use of chatbots by both customers and business management.

When analyzing the parameters influenced by proposed improvements, it is necessary to assess its feasibility, which means for the analysis of rational expediency and analysis of emotional expediency of chatbot's benefits [5].

Rational and emotional aspects of chatbots benefits influenced by proposal were analyzed during the research of benefits with the help of the proposed methodology. The proposed method was used:

The rational aspect of the expediency of contractual policy was assessed by such parameters as convenience for customer, financial benefit, and organizational advantage.

The emotional aspect of the expediency of contractual policy was studied on such parameter as prestige, human factor. The analysis of rational and emotional aspects of expediency of chatbots' benefit of the enterprise is given in tab. 3.2.

Analyzing the rational aspect, we see that such indicators as convenience for customer, and organizational advantage are at a high level. Problem is observed in the sector directly related to financial side, namely "financial benefit" (weighted score of 2.22 points, which indicates that the appropriateness of parameter is a bit higher than average). Analysis of the emotional aspect also shows a high level the human factor importance for the enterprise (the overall weighted score is 2.63 points). Indicator such as the "human factor" is highly praised by experts.

Assessment of the relative importance of the parameters is not limited to the processing of questionnaires. No less important issues for scientific substantiation are the assessment of the indicator of the degree of agreement of experts' opinions with the help of a system of indicators [5].

Table 3.2

Analysis of rational and emotional aspects of the feasibility of benefits of chatbots

Parameters	Weight	Expert's rating			Average rating	Weighted rating
Rational aspect						
1. Convenience for customer						
1.1. 24x7 availability	0,30	3	3	3	3,00	0,90
1.2. Simplicity of use	0,15	3	2	3	2,67	0,40
1.3. Absence of queues	0,37	3	3	3	3,00	1,11
1.4. Constant informational support	0,18	3	2	2	2,33	0,42
Overall result	1,00					2,83
2. Financial benefit						
2.1. Cheapness of maintenance	0,35	3	2	2	2,33	0,82
2.2. Saving costs for personnel	0,35	3	2	1	2,00	0,70
2.3. Higher productivity	0,30	3	2	2	2,33	0,70
Overall result	1,00					2,22
3. Organizational advantage						
3.1 . Contains a limitless database	0,40	3	3	3	3,00	1,20
3.2. Suitable for any type of business	0,25	3	2	3	2,67	0,67
3.3. Performs adjusted operations	0,23	3	3	3	3,00	0,69
2.4. Does not require education	0,12	3	3	3	3,00	0,36
Overall result	1,00					2,92
Average rating of rational aspect						2,65
Emotional aspect						
5. Human factor						
5.1. Approachability and friendliness	0,15	3	3	3	3,00	0,45
5.2. Detailed \expert answers	0,40	3	3	3	3,00	1,20
5.3. Complaints accepted quickly	0,20	3	2	2	2,33	0,47
5.4. Easy communication	0,15	3	2	2	2,33	0,35
5.5. No language barriers	0,10	2	2	1	1,67	0,17
Overall result	1,00					2,63

The concordance coefficient is used to estimate the generalized degree of agreement of opinions on all parameters [5].

The concordance coefficient characterizes the degree of consistency of researchers' judgments in all areas (factors, parameters). The Kendall's concordance coefficient is determined, on the basis of which conclusions are made about the consistency of experts' opinions. If the Kendall concordance coefficient is zero, then there is an absolute

inconsistency of experts' opinions [1]:

1 is full consistency of opinion;

less than 0.2 - 0.4 - weak consensus of experts;

more than 0.6 - 0.8 - strong agreement of experts.

To determine the consistency of experts' opinions on such indicators as "convenience for customer" and "human factor", we calculate the concordance coefficient.

The calculation of the Kendall's concordance coefficient is shown in the table 3.3.

Table 3.3

Calculation of concordance coefficient( performed in Excel)

Number of parameter	Experts' ratings			New Ranks			Matrix of ranks			Sum of ranks	d	d <sup>2</sup>	T		
	№1	№2	№3	№1	№2	№3	x1	x2	x3				1	2	3
1.1.	3	3	3	5,5	3	3	5,5	7,5	7	20	5	25	42	15	12
1.2.	3	2	3	5,5	3	3	5,5	3	7	15,5	0,5	0,25			
1.3.	3	3	3	5,5	3	3	5,5	7,5	7	20	5	25			
1.4.	3	2	2	5,5	3	7	5,5	3	3	11,5	-3,5	12,25			
5.1.	3	3	3	5,5	3	7	5,5	7,5	7	20	5	25			
5.2.	3	3	3	5,5	7,5	7	5,5	7,5	7	20	5	25			
5.3.	3	2	2	5,5	7,5	7	5,5	3	3	11,5	-3,5	12,25			
5.4.	3	2	2	5,5	7,5	7	5,5	3	3	11,5	-3,5	12,25			
5.5.	2	2	1	5,5	7,5	7	1	3	1	5	-10	100			
Σ							45	45	45	135		237	69		

Место для уравнения.

Concordance coefficient, or calculation coefficient consistency of opinion of experts, is calculated with the help the following formula:

$$W = \frac{12 \sum d^2}{m^2(n^3 - n) - m \sum T} \quad (3.1)$$

where W is the concordance coefficient;

m - number of experts;

n -sample size.

Deviation of the sum of ranks from the average sum is calculated by the following formula:

$$d = \sum x_1 - \frac{\sum \Sigma x_{1,2,3}}{n} , \quad (3.2)$$

where d is the deviation from the sum of ranks;

$x_1$  is the 1<sup>st</sup> rank from the matrix of ranks;

n – number of parameters (n=9).

The number of groups of related ranks is calculated as follows formula:

$$Ti = \frac{1}{12} \Sigma (t_1^3 - t_1) , \quad (3.3)$$

where Ti is the number of sheaves (types of repeating elements);

$t_1$  - the number of related ranks.

So, according to our table the concordance coefficient is equal to :

$$W = \frac{237}{\frac{1}{12} * 3^2 * (9^3 - 9) - (3 * 69)} = 0.71$$

So, the concordance coefficient is equal to 0.71. This result shows that the degree of consistency of expert opinions is high and the proposal positive influence on the customers' experience of chatbots use is confirmed to be positive. To sum up, in this subchapter, the proposal for improvement of chatbots at the LLC "Nebozvid" was impeached and justified with the help of . Kendall's concordance coefficient.



### 3.3. Evaluation of economic efficiency of chatbots use in the enterprise

The chatbots in the medical sphere also may perform much more functions than just scheduling and communication. The work of doctors is complex in itself. But administrative work such as filling out various papers and reports, and scheduling an appointment takes up one-sixth of the therapist's time. All these functions can be performed by a chatbot. Bots can also collect preliminary data on patient complaints, assign and reassign admissions, enter information into medical records, redirect patients to other departments of the hospital. [36;19].

Determining the effectiveness of the measures proposed in the thesis is necessary in order to justify the feasibility of their implementation in the practical activities of the enterprise.

Efficiency characterizes the effectiveness of any costs, and therefore its definition involves comparing the cumulative effect of the proposed measures to the costs of their implementation and realization (1).

$$E = \frac{e}{C} \cdot 100\% , \quad (3.4)$$

where  $E$  is the effectiveness of the proposed measures,%;

$e$  is cumulative effect of the implementation of the proposed measures, UAH;

$C$  is costs necessary for the implementation of the proposed measures, UAH.

To calculate cumulative effect of the implementation of the proposed measures, it should be determined the profit which proposal will bring. In the case of this proposal, it will bring profit be the increasing of work productivity with the help of chatbots, so, decreasing the costs spent on personnel who services customers ( call –center stuff, customer support). Costs are spent on the servicing personnel nowadays , and costs will be spent after proposal implementation and difference between the are calculated in the table 3.4.

Table 3.4

## Calculation of the effect of proposed measures

Parameter	Probable salary of employee	Planned number of employees	Actual number of employees	The annual salary of actual employees	The salary of planned number of employees	Costs can be saved
Average monthly salary of 1 call center manager	10 000	10	17	2040000	1200000	840000
Average monthly salary of 1 client manager	15 000	14	24	4320000	2520000	1800000
Total	25 000	24	41	6360000	3720000	2640000

The actual and planned number of employees as well as their current salaries are shown to calculate, how costs on staff will change after improvements.

The amount of money can be saved after improvement is calculated by the formula:

$$e = \sum(n_a \cdot S \cdot 12) - \sum(n_p \cdot S \cdot 12)$$

where e – saved costs(cumulative effect of the implementation of the proposal;

$n_a$  – actual number of employees;

$n_p$  – planned number of employees;

S – salary .

So the amount can be saved a year is equal to 2640000 UAH. Now, to calculate the effectiveness of the proposed measures , the costs spent for proposal implementation will me determined and shown in the table 3.5. The cost of proposal implementation for the 1<sup>st</sup> year is determined by adding all the costs need to be spent on proposal implementing. According to the calculation 506 000 UAH might be invested to implement changes during 1<sup>st</sup> year and 344 000 UAH each further year to maintain and update chatbots.

Table 3.5

## Costs must be spent for proposal implementation

Proposal	Probable cost\ UAH
1. Creating conversational chatbot in Telegram	
Development of chatbot	30 000
2. Creating conversational chatbot in Viber	
Development of chatbot	30 000
3. Improving of existing chatbot in the app "Evvivabot"	
Cost of server and technical equipment and education for stuff	20 000
Cost of work of IT specialist	40 000
Cost of 1 time staff education	350 000
Technical maintenance of all bots during a month ( salary of 1 newly hired specialist)	27 000
Technical maintenance of all bots during a year ( salary of 1 newly hired IT specialist)	324 000
Overall cost of implementation during 1st year	506 000
Further overall cost of maintenance( for 1 year)	344 000

After all, the effectiveness of the proposed measures is calculated:

$$E = \frac{2640000}{506000} \cdot 100\% = 522\% \text{ ( 1}^{\text{st}} \text{ year)}$$

$$E = \frac{2640000}{344000} \cdot 100\% = 767\% \text{ (further years)}$$

To sum up, in this subchapter the economical effectiveness of thesis proposals was estimated and it was determines that for the 1<sup>st</sup> year of proposal implementation, the probable effectiveness will be 522%. so will increase in 5 times and all further years it will be increases in 7 times compared with the period before implementation because the main spending will be done during the 1<sup>st</sup> year of implementation.

The proposal for the use of chatbots as a way of communication with customers were done, after their scientific and practical significance were proved with the help of concordance method , finally, the economic effectiveness of proposals was represented in this chapter.

## CONCLUSION

Given the popularity of robotic assistants technology, it is logical that it is penetrating almost all areas of business. It is for the e-commerce business that the most important and useful side of chatbot technology opens up, this is marketing and sales. The chatbot market has significant prospects due to its strong performance and expected growth rates. Therefore, large social networks or well-known applications with a large number of users are developing rapidly.

In the first section of this paperwork, the concept essence and main tasks of chatbot is described and its main features and stages of development are identified. The morphological analysis of the word "chatbot" was done. After that the directions and benefits of using chatbots were highlighted.

In the second chapter of the work, the comprehensive analysis of activity of LLC "NEBOZVID" was done. General characteristics of LLC "Nebozvid" were described as well as the analysis of technical and economic indicators of the activity of LLC "Nebozvid" was performed. Also in this section of the study was analyzed the organizational structure of the enterprise and technical and economic performance of the enterprise.

Financial analysis was performed using horizontal, vertical and main groups of financial indicators. In order to study the analysis of the subject area of LLC "Nebozvid" to, analyze the use of chatbots in the business processes of the enterprise, determined the type of chatbots used, conducted a SWOT analysis of chatbot use, and conclusions are done.

In the third section of the paper, the proposal for the use of chatbots as a way of communication with customers were done, after their scientific and practical significance were proved with the help of Kendall's concordance method, finally, the economic effectiveness of proposals was represented. Besides this, the economical effectiveness of thesis proposals was estimated in order to prove the significance of the offer.

So, there are 2 foremost problems that need to be stepped forward to growth the effectiveness of chatbot and the extent of the customers' satisfaction. Firstly, the present

informational chatbot, which is named "EvvivaBot" need to be stepped forward and carry out all its functionality. Secondly, the conversational chatbots in messengers such as Viber and Telegram as opposed to talking to alive employees need to be created and set in line with the viable inquiries of customers.

To solve these issues , sets of measures were proposed for each problem. And, the probable cost of these measures were calculated, as well as both their practical and scientific effectiveness were proved.

Chatbots are presently taken into consideration an critical a part of the virtual approach of maximum companies: they both already use present day intelligence, or intend to apply it withinside the close to future. Bots are utilized in marketing and marketing campaigns and communications with customers. The benefit of human beings over bots, specifically empathy and bodily presence of their very own communication, are already starting to fade into the background

. Since for commercial enterprise and for a easy user, the paintings of a talk bot 24/7 substantially simplifies life, in which there's an possibility to save plenty of time. Therefore, enterprises should prioritize the task of adapting chatbots to business processes.

The results of this paper might have been taken for the future research to develop the scheme and sequence of chatbots improving and innovation implementing.

## LIST OF REFERENCES

1. Білоцерківський, О. Б. Дослідження сучасного стану та програмного з а
2. Войчак А.В. Конкурентні переваги підприємства: сутність і класифікація. / А.В. В
3. Діпайко Т. І., Коюда В. О., Лукашов С. В. Інноваційний менеджмент: Навчальний посібник. – Х.: ІНЖЕК, 2005. – 440 с.
4. Методичні рекомендації до виконання бакалаврської дипломної роботи для студентів спеціальності 051"Економіка" першого (бакалаврського) рівня [Електронний ресурс] / укл. Г.В. Назарова, О.В. Іванісов, Н.С. Маркова, С.В. Мішина; Харківський національний економічний університет ім. С. Кузнеця. - Електрон. текстові дан. (533 КБ). - Х. : ХНЕУ ім. С. Кузнеця, 2017. - 39 с.
5. Панчук А. С. Доцільність договірної політики як основа удосконалення закупівельної логістики підприємства / А. С. Панчук, Т. О. Гребенюк // Науковий вісник Міжнародного гуманітарного університету. – 2017. – Випуск 23. – С. 121 – 125.
6. Стефанова Н.А. Месенджери як цифровий бізнес– інструмент / Н.А. Стефанова, К.О. Шматок // Карельський науковий журнал – 2019. – № 2 (23). – С. 127–129.
7. К
8. В
9. Britz D. Deep Learning for chatbots [Electronic source] / D. Britz – 2020. – Access Code: [www.wildml.com/2016/04/deep-learning-for-chatbots-part-1-introduction/](http://www.wildml.com/2016/04/deep-learning-for-chatbots-part-1-introduction/)
10. Chatbot magazine. Chatbot Report 2019: Global Trends and Analysis [Electronic
11. Chatbot Market Size, Share & Trends Analysis Report. [Electronic source] – 2021. –

- Access mode: <https://www.grandviewresearch.com/industry-analysis/chatbot-market-chatbot-report-2019-global-trends-and-analysis-a487afec05b>
12. Costa, P. Conversing with personal digital assistants: on gender and artificial intelligence. [Electronic source] / P. Costa // J. Sci. Technol. Arts, 2018. – p. 59–72. – Access mode: <https://doi.org/10.7559/citarj.v10i3.563>
  13. Dahiya M. A tool of conversation: Chatbot / M. Dahiya // International Journal of Computer Sciences and Engineering. – 2017. – T. 5. – №. 5. – p. 158-161.
  14. Doshi S. V. et al. Artificial intelligence Chatbot in Android system using open-source program / S. V. Doshi // International Journal of Advanced Research in Computer and Communication Engineering. – 2017.
  15. For which types of business are chatbots most useful? Analysis of successful examples [Electronic source] – 2020. – Access mode: <https://evergreens.com.ua/ru/articles/bots-for-business-cases-1.html>
  16. Frankenfield J. Chatbot. [Electronic source] / J. Frankenfield // Chatbot. – 2021. – Access mode: <https://www.investopedia.com/terms/c/chatbot.asp>
  17. Gartner Glossary. Chatbot definition. [Electronic source] / Gartner Glossary // Chatbot definition. – 2021. – Access mode: <https://www.gartner.com/en/information>
  18. How to Design a Chatbot: Creating a Conversational Interface [Electronic source] – 2021. – Access mode: <https://onix-systems.com/blog/how-to-design-a-chatbot-creating-a-conversational-interface>
  19. Hype Cycle for Emerging Technologies [Electronic source] – 2020. – Access mode: <https://www.gartner.com/smarterwithgartner/5-trends-drive-the-gartner-hype-cycle-for-emergingtechnologies-2020/>
  20. John Hopkins Medicine [Electronic source] – 2020. – Access mode: <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/benefits-of-telemedicine#:~:text=To%20help%20prevent%20the%20spread,come%20in%20to%20the%20office>

21. Ketakee N., Tushar C. Chatbots: An overview. Types, Architecture, Tools and Future Possibilities / N. Ketakee, C. Tushar // International Journal for Scientific Research & Development – 2017. – № 5. – С. 1019–1025. – Access mode: [https://www.researchgate.net/publication/320307269\\_Chatbots\\_An\\_overview\\_Types\\_Architecture\\_Tools\\_and\\_Future\\_Possibilities](https://www.researchgate.net/publication/320307269_Chatbots_An_overview_Types_Architecture_Tools_and_Future_Possibilities)
22. Khan R. Build Better Chatbots: A Complete Guide to Getting Started with Chatbots/ R. Khan, A. Das – Apress, 2017. – p.75–80.
23. Khan R. Build Better Chatbots: A Complete Guide to Getting Started with Chatbots/ R. Khan, A. Das – Apress, 2017. – p.72–75.
24. Khan R. Build Better Chatbots: A Complete Guide to Getting Started with Chatbots/ R. Khan, A. Das – Apress, 2017. – p.72–74.
25. Khanna, A. A study of today’s A.I. through chatbots and rediscovery of machine intelligence. [Electronic source] / A. Khanna, B. Pandey, K. Vashishta, K. Kalia, P. Bhale, T. Das // Int. Sci. Technol. 2015. p. – 277–284. – Access mode: <https://doi.org/10.14257/ijunesst.2015.8.7.28>
26. Marketing charts. Consumers See Chatbots’ Benefits Mainly in Terms of Speed [Electronic source] / Marketing charts – 2018. – Access mode: <https://www.marketingcharts.com/customer-centric-82254>
27. Medical center ” Evviva” [Electronic source] – 2021. – Access mode: <https://evviva.com.ua/about-us/o-nas>
28. Mescherakov A. What is it Telegram bot? [Electronic source] / A. Mescherakov – 2019. – Access mode: <https://sharkdevelop.com/boty-v-telegram/>
29. Peitzker T. Uses and Risks of Business Chatbots. / T. Peitzker – Business Expert Press, 2020. – p. 14.
30. Rahman A. M. Programming challenges of chatbot: Current and future prospective / A. M. Rahman, A. Al Mamun, A. Islam // 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC). – IEEE, 2017. – p. 75-78.
31. Ranoliya B. Chatbot for university-related FAQs / B. R. Ranoliya, N. Raghuwanshi,



- S. Singh // 2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI). – IEEE, 2017. – p. 1525-1530.
- 32.Simonite T. Facebook’s Perfect, Impossible Chatbot [Electronic source] / T. Simonite – 2019. – Access mode: <https://www.technologyreview.com/s/604117/facebooks-perfect-impossible-chatbot/>
- 33.Singh A. Building an Enterprise Chatbot: Work with Protected Enterprise Data Using Open Source Frameworks / A. Singh, K. Ramasubramanian, S. Shivam – Apress, 2019. – p. 32–35.
- 34.Sitecore. Customers for Life: Technology Strategies for Attracting and Keeping Customers [Electronic source] / Sitecore. // Forbes Insights. – 2014. – Access mode: <https://www.forbes.com/forbesinsights/sitecore/source/> / Chatbot magazine – 2018. – Access mode: <https://chatbotsmagazine.com/>
- 35.The Medical Futurist. The Top 12 Health Chatbots [Electronic source] / The Medical Futurist – 2021. – Access mode: <https://medicalfuturist.com/top-12-health-chatbots/>
- 36.Top 6 Use Cases and Examples of Chatbots in Healthcare in 2022 [Electronic source] – 2022. – Access mode: <https://research.aimultiple.com/chatbothealthcare>
- 37.VentureBeat. 6 roles where chatbots are so useful right now [Electronic source] / VentureBeat. – 2017. – Access mode: <https://venturebeat.com/2016/09/16/6-roles-where-chatbots-are-so-useful-right-now/>
- 38.Walk-Morris T. Study: Consumers like chatbots but prefer human interaction Important [Electronic source] / T. Walk-Morris . – 2019. – Access mode: <https://www.marketingdive.com>
- 39.Xu A. A new chatbot for customer service on social media / Xu, A. Liu, Z. Guo, Y. Sinha, V. & Akkiraju, R. // In Proceedings of the 2017 CHI conference on human factors in computing systems – 2017. – p. 3506-3510.

**APPENDIXES**

Appendix A  
Financial statements of LLC “Nebozvid”

Додаток 1  
до Національного положення (стандарту)  
бухгалтерського обліку  
1 "Загальні вимоги до фінансової звітності"

	Дата (рік, місяць, число)	КОДИ
Підприємств _____	_____ за ЄДРПОУ	01
Територія _____	_____ за	
Організаційно-правова форма _____	_____ за КОПФГ	
Вид економічної _____	_____ за КВЕД	
Середня кількість _____		
Адреса, _____		
Одиниця виміру: тис. грн. без десяткового знака (окрім розділу IV Звіту про фінансові результати (Звіту про сукупний дохід) (форма N 2), грошові показники якого наводяться в гривнях з копійками)		
Складено (зробити позначку "v" у відповідній клітинці):		
за національними положеннями (стандартами) бухгалтерського обліку		
за міжнародними стандартами фінансової звітності		

### Баланс (Звіт про фінансовий стан)

на \_\_\_\_\_ 20\_\_ р.

Форма N 1 Код за ДКУД 1801001

Актив	Код рядка	На початку звітного періоду	На кінець звітного періоду
1	2	3	4
<b>I. Необоротні активи</b>			
Нематеріальні активи	1000		2
первісна вартість	1001		
накопичена амортизація	1002		
Незавершені капітальні інвестиції	1005		
Основні засоби	1010		
первісна вартість	1011		
знос	1012		
Інвестиційна нерухомість	1015		
Довгострокові біологічні активи	1020		
Довгострокові фінансові інвестиції : які обліковуються за методом участі в капіталі інші підприємств	1030	17	17
інші фінансові інвестиції	1035		
Довгострокова дебіторська заборгованість	1040		
Відстрочені податкові активи	1045		
Інші необоротні активи	1090		
Усього за розділом I	1095		
<b>II. Оборотні активи</b>			
Запаси	1100	45	73
Поточні біологічні активи	1110		
Дебіторська заборгованість за продукцію , товари , роботу , послуги	1125		
Дебіторська заборгованість за розрахунками : за виданими авансами	1130		

Закінчення таблиці			
з бюджетом	1135	2	
у тому числі з податку на прибуток	1136		
Інша поточна дебіторська заборгованість	1155		
Поточні фінансові інвестиції	1160		
Гроші та їх еквіваленти	1165		
Готівка	1166		
Рахунки в банках	1167		
Витрати майбутніх періодів	1170		
Інші оборотні активи	1190		
Усього за розділом II	1195		
III. Необоротні активи , утримувані для продажу, та групи вибуття	1200		
Баланс	1300		

Пасив	Код рядка	На початку звітного періоду	На кінець звітного періоду
1	2	3	4
I. Власний капітал			
Зареєстрований ( пайовий ) капітал	1400		
Капітал у дооцінках	1405		
Додатковий капітал	1410		
Резервний капітал	1415		
Нерозподілений прибуток ( некритий збиток )	1420		
Неоплачений капітал	1425		
Вилучений капітал	1430	( )	( )
Усього за розділом I	1495		
II. Довгострокові забезпечення і забезпечення			
Відстрочені податкові зобов'язання	1500		
Довгострокові кредити банків	1510		
Інші довгострокові зобов'язання	1515		
Довгострокові забезпечення	1520		
Цільове фінансування	1525		
Усього за розділом II	1595		
III. Поточні зобов'язання і забезпечення			
Короткострокові кредити банків	1600		
Поточна кредиторська заборгованість за:			
довгостроковими зобов'язаннями	1610		
товари , робота , послуги	1615		
розрахунками з бюджетом	1620		
у тому числі з податку на прибуток	1621		
розрахунками зі страхування	1625		
розрахунками з оплати праці	1630		
Поточні забезпечення	1660		
Доходи майбутніх періодів	1665		

Інші поточні зобов'язання	1690		
Усього за розділом III	1695		
IV. Зобов'язання, пов'язані з необоротними активами, утримуваними для продажу, та групами вибуття	1700		
Баланс	1900		

**Appendix B**

The article on the topic of research

УДК 339.3:338

## **THE CHATBOTS IMPLEMENTATION AS A WAY OF COMMUNICATION WITH THE CUSTOMERS IN BUSINESS**

**Бобрицька Юлія Юріївна**

**студентка 4 курсу першого (бакалаврського) рівня вищої освіти  
спеціальності 073 «Менеджмент», ХНЕУ ім. Семена Кузнеця**

**gjretb@gmail.com**

Over the past few years, the rhythm of life has become more dynamic, one of the main factors, pushed to this, was the development of information technology aimed at simplifying the daily life of a modern person. And one of these technologies is the use of messengers.

Much of business processes consist of formalized, repetitive procedures that anyone can perform with varying degrees of success, depending on their mood, well-being, weather, time of day, any day of the week. Communication on these issues can be transferred to the chatbot. The exchange of messages based on artificial intelligence makes all this possible, and the number of potential clients is significantly increased compared to traditional, uncycled tools [1].

A chatbot , sometimes referred to as a chatterbot , is programming that simulates the conversation or "chatter" of a human being through text or voice interactions. Chatbot virtual assistants are increasingly being used to handle simple, look-up tasks in both business-to-consumer (B2C) and business-to-business (B2B) environments [1]. The only job of a chatbot is to get the input from the user and return the processed response as per the input. The input could be of any form e.g. it could be a text from an end-user, a live chat, or a voice input. The chatbot accordingly manages to respond as per the desired /user object response format. One of the best examples of a smart chatbot is Amazon's Alexa or Google's Assistant software [6].

Most chatbots are programmed for certain chains of events that lead to a certain result and provide programmed data to the user. But advances in artificial intelligence (AI) in



combination with the development of messengers contribute to their development. The main purpose of using this software product is to help customers achieve their ultimate goal as quickly as possible: to obtain additional information or to sell goods or services.

Generalizing all modern chatbots functionality, their tasks can be structured into three groups: performing routine operations (mechanical work that can be performed according to a specific algorithm), searching and aggregating data, dissemination of information, the first line of interaction with clients (besides providing advice on goods and services, chatbots can concentrate and entertain the user [**Ошибка! Источник ссылки не найден.**]). In terms of business objectives, there are only three main tasks that chatbots can perform.

1. Automation of work with the client. A chatbot can automate messaging with the client in the form of a simple and convenient interface. The user can instantly get full information about the product (service), company, or brand, get answers to frequently asked questions, leave the application, write in support, etc.
2. FAQ automation. The chatbot can respond to significant volume standardized questions on a 24/7 basis.
3. Mailings. According to numerous studies and case studies of marketers and analysts, messengers have become the best channel of communication and delivery of content by the ratio of «efficiency-cost», showing results better than in other digital channels, such as e-mail and SMS.

Chatbots are now actively used in marketing for communication with clients, as well as for solving problems within the company. According to Drift's 2020 State of Conversational Marketing report, usage of chatbots as a brand communication channel increased by a whopping 92% since 2019. 24.9% of buyers used chatbots to communicate with businesses in 2020, up from 13% the year before [7]. Consider in detail what chatbots can do.

1. Customer service. This chatbot function is equivalent to the tasks of a customer service manager in a company. For example, you can order a pizza or a taxi. The main difference of this client service is that the user can turn to a chatbot at any time convenient

for him. Thus, it makes the service available 24 hours a day and increases customer satisfaction.

2. Product promotion. Chatbots can also be used as a channel to inform customers about new products, promotions, and discounts. Thus, it brings chat-bot communication closer to human-to-human communication, which allows the company without the expense of human resources to attract users [3].

3. Cooperation with "live" managers. Chatbots handle a limited range of issues, so if necessary and in the event of a situation with which the program will have difficulties, you should identify the person-agent and redirect him to address this issue. Therefore, we can safely say that bots to some extent free the consultant from small work and help to switch to more complex and urgent tasks. The survey done by Userlike states that 68% of consumers like chatbots because they provide quick answers [8;6].

4. Chatbots help to reduce operating costs for company employees. For most companies, especially young ones, having round-the-clock support is too costly, and it is the chatbot that can solve this problem. According to IBM Statistics, chatbots can save businesses as much as 30% on customer support costs [7].

Currently, the use of chatbots is a good alternative to a large sales department and technical support, so it may seem an attractive idea for automation. It is expected that digital transformations will continue to transform all types of business, and chatbots by 2022 will save billions of dollars for companies by optimizing customer service using chatbots [9]. Companies with a large customer base and/or limited resources can benefit from automating customer service in the form of virtual agents or live chats. With live chatbots assisting customers at the forefront, human agents can tackle more complex interactions and issues. Further research on this issue should be carried out, on the one hand, in the direction of the wider introduction of chatbots into business, on the other hand, in the direction of training both business owners and company employees to use chatbots as an auxiliary tool to improve the efficiency of interaction with customers.

## References

1. Search customer experience: chatbot URL: [https:// searchcustomerexperience.techtarget.com / definition / chatbot](https://searchcustomerexperience.techtarget.com/definition/chatbot)
2. How Artificial Intelligence Will Transform Business. URL: <https://www.businessnewsdaily.com/9402-artificial-intelligence-business-trends.html>
3. Neuron networks and marketing URL: [https://witget.com/ blog/nejronnye-seti-i-marketing/](https://witget.com/blog/nejronnye-seti-i-marketing/)
4. Martin N. Okay, Google, Will Voice Be the Future of Search? –11/06/2018 // Forbes. –URL: <https://www.forbes.com/sites/nicolemartin1/2018/11/06/ok-google-will-voice-be-the-future-of-search/#5a0f7ad37d04>
5. Customers for Life: Technology Strategies for Attracting and Keeping Customers // Forbes Insights. – 2014. URL: [https:// www. forbes.com / forbesinsights / sitecore/](https://www.forbes.com/forbesinsights/sitecore/)
6. Akhil Mittal Getting Started with Chatbots: learn and create your own chatbot with deep understanding of Artificial Intelligence and Machine Learning Paperback – 2019. Pp 1– 6.
7. 25 Top Chatbot Statistics: Usage, Demographics, Trends URL: [https://startupbonsai.com/ chatbot-statistics/](https://startupbonsai.com/chatbot-statistics/).
8. What Do Your Customers Actually Think About Chatbots? URL: <https://userlike.com/en/blog/consumer-chatbot-perceptions>
9. Ways to Integrate a Chatbot in Your Marketing and Sales Objectives. URL: <https://chatbots.expert/en/9-ways-to-integrate-a-chatbotinto-your-marketing-and-sales-objectives/>