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CHAT BOTS AS A TREND IN E-COMMERCE DEVELOPMENT

ЧАТ-БОТИ ЯК ТЕНДЕНЦІЯ РОЗВИТКУ ЕЛЕКТРОННОЇ КОМЕРЦІЇ

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Івашко Л.М., Якімова І.А. Чат-боти як тенденція розвитку електронної комерції. Оглядова стаття.

У статті розглянуто один з основних напрямів розвитку електронної комерції, який ґрунтується на основі досягнень штучного інтелекту та методів обробки природної мови, – чат-боти. Також проаналізовано основні причини, які сприяли інтенсивному впровадженню та широкому розповсюдженню цієї технології, яка імітує спілкування з реальними людьми, основні тенденції розвитку світового ринку чат-ботів, його обсягу та значущості для майбутнього. Особливу увагу приділено технології впровадження чат-ботів у сферу психологічної допомоги. Досліджено низку основних існуючих чат-ботів психологічної допомоги, що повноцінно функціонують на ринку. Проаналізовано основні переваги та недоліки даної технології на основі 15 критеріїв для проведення аналізу. Визначено вигоди від застосування таких чат-ботів. Окреслено перспективи щодо їх впровадження в електронну комерцію.

Ключові слова: електронна комерція, штучний інтелект, чат-бот, ринок чат-ботів, психологічна допомога

Ivashko L.M., Yakimova I.A. Chat bots as a trend in e-commerce development. Review article.

The article considers one of the main directions of e-commerce development, which based on the achievements of artificial intelligence and natural language processing methods – chatbots. The main reasons that contributed to the intensive introduction and widespread use of this technology, which simulates communication with real people, the main trends in the global chatbot market, its volume and significance for the future are also analyzed. Particular attention paid to the technology of introduction of chatbots in the field of psychological care. A number of the main existing chatbots of psychological assistance that are fully functioning in the market have been studied. The main advantages and disadvantages of this technology analyzed on the basis of 15 criteria for analysis. The benefits of using such chatbots have been identified. Prospects for their introduction into e-commerce are outlined.

Keywords: e-commerce, artificial intelligence, chatbot, chatbot market, psychological help

One of the promising areas of e-commerce development since 2016 is the introduction and configuration of chatbots – automated programs based on artificial intelligence that mimic communication with real people. In previous years, many of the benefits of artificial intelligence have not yet been realized in e-commerce, but in 2020, the situation has changed dramatically. Concepts such as artificial intelligence, automation and chatbots are becoming increasingly popular in e-commerce. Moreover, brands can use them for real business impact. In the future, companies looking to optimize their e-commerce potential will be able to rely more on talk agents as online orders increase and consumers look for new ways to buy goods and services online. Technologies that use emotional artificial intelligence try to interpret human emotions from text, voice patterns, facial expressions, and other nonverbal cues – and in many cases mimic those emotions in response. By using covert behavior and reactions, businesses can use this "emotional data" to increase their profits and better meet customer needs. It is extremely important to constantly improve the company's customer service to ensure its growth and success. Companies that give priority to customer service have a higher income than their competitors do. It is possible to improve customer support with the help of chatbots. Chatbots use artificial intelligence to communicate with customers in real time, build brand trust and increase engagement. Even when managers and specialists are not available, chatbots work around the clock, serving online visitors. With advances in natural language processing and artificial intelligence, chatbots make healthcare easier to navigate, shopping more personalized, and lawyers more efficient, and more.

Instead of trying to grasp the vast, companies choose certain features that make sense to solve with a chatbot, and they become more useful and adaptable. Today's most effective bots are narrowly focused conversational technology applications. Although they may seem less bright, these bots are becoming more advanced and have a noticeable impact on their industries. The Covid-19 pandemic has also drawn attention to this technology, and a significant number of chatbots have proved invaluable for handling the surge in consumer inquiries and concerns.

Specialized chatbots are also gaining momentum in the field of health, including psychological and well-being.

Analysis of recent research and publications

The chatbot industry is emerging from its infancy. In 2020, for the first time, medium and late stage agreements accounted for half of all agreements in this area, which indicates the maturity of the technology and the companies that develop it. The Covid-19 pandemic helped accelerate this shift. As organizations deal with a significant number of requests, adapting to remote work, chatbots are deployed to respond quickly to requests, reduce the number of unfinished business and increase efficiency. Entrepreneurs try to determine their economic efficiency and feasibility of implementation in their activities. The development of the market of this technology is closely monitored by various economic journals, such as Accenture, Business, Tadviser, as well as a significant number of researchers around the world. However, most of them focus on: the service sector in general, as Jared Atchison (Atchison Jared, 2020) [1]; the impact of technology on marketing processes in business, as Ginevičius V.V [2]; introduction of chatbots in the company's business and their integration with the CRM-system, as Lysenko O.V. [3] and the like. Only a small part of the media and Internet resources are actually devoted to research and study of chatbots in the field of psychological care, although such assistants have appeared more and more in the last few years, and the need for their use is growing.

The purpose of this article is to study the market of existing chatbots for psychological care and analyze their advantages and disadvantages.

Each chatbot has its advantages and nuances, which developers are constantly "refining". Considering the history of the spread of chatbots, it is easy to see that this trend is not detrimental: each technology has disadvantages that are eventually eliminated or become the opposite – the advantages.

The main part

Despite its rapid spread, chatbots, like any other "robotic" innovation, initially did not inspire confidence in humanity. For example, only half of Europeans and a third of Americans still find chatbots useful. In addition, the other 50% of Americans are more happy to communicate with a living person, solving a problem [4]. In Ukraine, there is distrust of this technology from the first steps of its application: the mentality of the people of our country prevents us from believing that artificial intelligence can solve problems as effectively as ordinary people. In this regard, a special "team" was created for chatbots in the CIS countries (including Ukraine). At first, such a command was like a joke, but now it is used: "Call a leather bag" or send a message that does not relate to the subject of the appeal. In this case, the robot switches the client to the operator.

Over time, chatbots became closer to the person, met more and more often, gaining the trust and affection of citizens. Since 2018, it has even been decided to annually celebrate World Virtual Assistant Day on the third Friday in May. Now we can hardly imagine our lives without these little "helpers". The direct spread of chatbots and their development very clearly show the growth of the global market for this development.

In 2018, the value of the chatbot market worldwide was only \$ 1.2 billion [4]. According to Accenture, in 2019 the volume of the chatbot market in Russia alone was about \$ 24.2 million [5], which was at least 2.5% of the total value of this market worldwide.

In 2020, North America, including the United States and Canada, was the largest market for chatbots in terms of revenue. In the same year, these regions accounted for 38% of world market revenue [4].

The United States is the largest and most attractive market for individual chatbots in the world. The dominance can be explained by the growing number of companies and the many studies in the field of artificial intelligence. Expected that in the forecast period from 2021 to 2026, North America will remain the largest market for chatbots in the world. On the other hand, the Asia-Pacific region is ready to show strong growth, ahead of developed markets such as Europe and North America, and by 2027 will become one of the main markets for chatbots [4]. The average annual projected rate of development of this market ranges from 30% to 38%, which is estimated to increase the market value to \$ 15.7 billion by 2024 [6].

Now these developments are actively used in various fields. For example, online stores, food delivery services place chatbots on their sites to speed up the receipt of orders, and such online consultants attract customers with their efficiency. Even Facebook has created a platform to host commercial chatbots that can book a table for a user or make a purchase as if a top manager served the customer.

For all their merits, chatbots can also be a threat because bots can pretend to be people, ask for important passwords or other personal information. Some online partner search services use chatbots to attract new users and force them to subscribe to some services. For example, in order for a user to continue talking to a "person" who meets his interests, age, sense of humor, in order to obtain personal information about him, he is invited to purchase a premium account [7].

Today, health care providers are overburdened and do not have sufficient resources, and areas far from large cities are particularly struggling to ensure continued access to health care. Throughout the clinical course, chatbots help gather information, educate patients and help them regain their balance, mimic the basic diagnostic and conversational functions of a regular visit to the doctor – already providing the best care and accessibility for millions of patients worldwide.

In 2019, the widespread introduction of chat robots on the pages of psychosocial care began at various stages: from simple support to psychotherapeutic care. The development of this trend began long before

quarantine through COVID-19, but this innovation began to spread rapidly due to its emergence. Initially, this form of psychological support was popular in the United States in various areas of business and was more entertaining. These chatbots helped employees relieve stress, find new motivation to work or simply create space for emotions that cannot be expressed in public.

Currently, a significant number of psychologists have lost regular patients due to quarantine, some have resorted to an online format but are unable to process a significant number of reports. However, not all psychologists have access to assistants or assistants. In addition, the incomes of all segments of the population fell during the corona crisis. Some workers in this field have found a way out of the situation not without the help of programmers: chatbots, which used to be used sometimes and mainly motivate employees, have now become real assistants to psychologists.

According to the National Institute of Mental Health, approximately one in five Americans suffers from some form of mental illness. For chatbot creators, the field of mental health has proved to be as convenient as the field of physical health when it comes to expanding access, reducing labor costs and improving outcomes.

Part of what makes psychiatric care convenient for chatbot experiments is that therapy is essentially a verbal process, especially cognitive-behavioral therapy (CBT), the most popular and widely studied form of therapy. The purpose of CBT is to teach patients to recognize negative stereotypes (also known as "cognitive distortions") and then rethink their thoughts in a less harmful and more productive way. Chatbots can be useful here because they can use natural language processing to recognize certain types of distortions and encourage users to rethink them [8].

The example is Woebot, developed in 2015. Woebot asks users how they feel, analyzes their responses to identify examples of cognitive distortion. The bot then teaches the user how to change their point of view according to a pre-designed decision tree, which determines the correct response to the user's request [8].

A team of researchers from Stanford developed Woebot. Before launching the service, project developer Alison Darcy published the results of a study on an early version of the chatbot in the *Journal of Medical Internet Research, Mental Health*. A study of 70 college students with depressive symptoms for 2 weeks found that participants who were asked to communicate with Woebot saw a significant reduction in depressive symptoms compared to participants who read the CPT e-book instead. According to Dr. Darcy, participants said that Woebot was more like a "friend" than an application or technology.

Another mental health chatbot, Wysa, also contains CBT principles, but with an additional emphasis on mindfulness and meditation. The application provides a "toolkit" of exercises designed for purposes such as focusing when you are stunned, conflict management and relaxation [8].

Wysa "learns" from its interaction with the user to recommend certain tools. However, the Wysa website emphasizes that the bot is "limited in response" and that it is "intended to be used as a tool for early intervention" and not as a substitute for personal therapy [8].

"Relationships" is one of the first psychological chatbots developed by iCognito and dedicated to family relationships. This chatbot named Lisa is built on a script type. He asks questions and, depending on the answers, leads through a tree of scenarios, it offers one of the lines of further dialogue. The dialogues are based on the work of the world's leading psychologists and psychotherapists, the questions are taken from clinical questionnaires. The algorithm quickly analyzes the answers, so communication with the bot captures the user [9].

The service is designed to analyze the relationship in a couple, and then offer solutions. If you answer the questions honestly, Lisa will really help to understand yourself and establish family relationships. The results of an experimental study conducted by the project curator Olga Troitskaya and her colleague Anastasia Bathina evidence this, in particular. The study showed that after two weeks of communication with Lisa, the users of the program "Relationships" increased the level of tenderness and happiness in relationships, developed skills of constructive communication, decreased levels of conflict, even with individual passage of the program [9].

The mobile application "Stress Management" with chatbot Ivan teaches positive thinking, increases emotional awareness, helps to analyze negative thoughts and manage irritation, as well as properly build relationships with colleagues [9].

From August 2020, work is underway to integrate artificial intelligence into iCognito services, which will recognize five or six psychological states: depression, anxiety, mistreatment, and so on. The model with artificial intelligence will allow the program to identify the nuances of the psychological state of man and ask more targeted questions, rather than offering answer options, as is happening now [9].

More "human" is the Ukrainian development – Elomia. This chatbot can be written, and he communicates only in English. From mid-2020, active work is underway to introduce other languages and create a program that will better protect users' personal data and have advanced features. In the future, Elomia will be able to call video and even see her using virtual reality technology [10].

The system is now based on Facebook's Messenger. The program has a free trial period – one week. In the future, you can issue a subscription, the price of which is from 0.98 pounds (approximately 32 hryvnia) [10].

Elomia's main advantage is that she has no alternative situations or scenarios, but generates an answer individually for each user. Every time Elomia writes something to you, it is a unique message, a unique flight of thought of the neural network specifically for the emotions that a person feels [10].

It is noteworthy that on resources where there are scripts, users spend an average of 2 hours. With Elomia, people spend about 6 hours. The authors of the development are convinced that it can be compared with a close friend, because not everyone has the desire to spend so much time communicating [10].

In October 2020, the UNESCO Institute for Information Technology in Education (IITO UNESCO) together with the social network VKontakte launched an innovative educational project – bot consultant Eli, which became the first such product in Russian [11].

Not every teenager has the opportunity to talk about "delicate" topics with loved ones or seek quality psychological support. In such cases, correspondence with the bot will be a convenient and secure option. Bot Eli can have hundreds of dialogues per second; unlike a person, he does not tire of repeating the same thing for the hundredth or even a thousand times, can be accessed at any time of the day and is guaranteed to keep the conversation a secret. Of course, the bot will not be able to replace communication with a living specialist, but it is able to provide prompt answers to a significant number of important and troubling questions [11].

You can ask the bot any question or choose one of the suggested ones. Artificial intelligence will select the answer based on possible semantic connections. For example, Eli will tell you what to do if partners cannot find a compromise on some issues. A large block of Eli's materials is devoted to HIV prevention, as well as its testing and treatment [11].

Eli involves addressing topics directly related to sexual and reproductive health (anatomy, contraception), as well as issues of relationship ethics and their emotional side (consent, violence, decision-making). Issues related to awareness of risks, attitudes to one's own and others' health, trust between partners, self-esteem, willingness to take responsibility, agree and disagree – are closely intertwined and have a comprehensive impact on decision-making. Eli is able to identify not always obvious connections between these aspects of life and bring the user closer to solving his problem or answering questions [11].

Interim results of the project indicate that the chosen format (chatbot) is comfortable for adolescents aged 14 to 18 years and can be used by other media as a tool for packaging large amounts of content, which raises questions in the audience [11].

Replika is an American company with Russian roots, launched by Yevhen Kuida, the former editor in-chief of the Afisha website, and Philip Dudchuk, a computer linguist at Moscow State University. For the past five years, they have been developing artificial intelligence that can communicate with the user in natural language. During this time, their project changed the concept several times: starting as a "smart" assistant in a banking application, it became an assistant for choosing restaurants, and then – a messenger that allowed users to create their own digital copy. In April 2019, the project team made a new turn: now Replika will focus on improving the psychological well-being of users and will help them deal with stress [12].

According to the founders, Replika should become a friend-mentor who can support in a difficult situation and advise how to improve psychological well-being or cope with stress. The new version of Replika has a "path" mode: each day the program selects four tasks. By doing them, you can understand your feelings, think about your life and so on. In addition, users can now call the "replica" to tell how their day went, to complain about anything, to ask her to tell a story. The "replica" backend works with text messages. The neural network recognizes the user's language and converts it into text, then processes the message, generates a text response, and then synthesizes the text into language [12].

It turns out that there are many differences between the way people write and the way they speak. The text message can be edited before sending, and the user "corrects" the voice message live. In the text interface you can answer emoji, and in the phone – no [12].

The application can use more "progressive" communication techniques: not only interested in hobbies, musical tastes and favorite movies, but also sends in response "memes", music videos or advises movies, focusing on user preferences.

The number of average Replika users per month varies from season to season. On average – from 150 to 200 thousand users. Sometimes during peak periods, up to 300,000 people use the bot to chat.

The German company Moodpath has developed an application of the same name, which is designed for early diagnosis of depression. In the year since its launch, 100,000 users have downloaded the application. In addition, the program has formed more than 25 thousand referrals for further treatment for doctors [13].

Today, Moodpath is the most popular app in the "depression" category in iOS app stores in the UK, Canada, Australia, Germany, Austria, Switzerland and the Netherlands. The user index of the program is in the range from 4.7 to 5. This program already has the necessary certification of European regulators and is designed to improve the detection of depression using a specialized algorithm and analysis of anonymous data. That is, it is designed to eliminate the "hole" in our health care, which can at least partially improve the timeliness of diagnosing depression – a disease that complicates the lives of millions of people around the world [13].

To confirm the scientific validity of the results of their product, Moodpath is currently conducting three clinical trials in Europe. In addition, negotiations are underway with American Columbia and Stanford universities to test the program in the United States [13].

In the near future, the application will be updated with the expansion of functionality, which will include the settings of daily plans for people suffering from depression. These plans will be individually tailored to the needs of each user, adapted to the successes already achieved and include psychological exercises based on cognitive-behavioral therapy [13].

Anyone can write in a chatbot. Psychologists help to cope with panic due to the effects of a pandemic, teach to deal with stress, reassure loved ones and tell what to do at home [13].

Volunteer psychologists work within the All-Russian action of mutual assistance #МыВместе. 24-hour calls to the hotline and through a specially created chatbot in Viber accept requests from citizens for psychological assistance. On October 9, the All-Russian public movement "Medical Volunteers" launched a chatbot on Telegram and VKontakte, through which anyone can get qualified psychological help online [14].

The system is configured so that the platform works not only through smartphones, but also with a personal computer at a convenient time for all participants in communication. The formed volunteer association of psychologists is constantly improving its activities and developing on the basis of the All-Russian public movement "Medical Volunteers" [14].

All-Russian action of mutual aid #МыВместе was launched on March 21, 2020 simultaneously with the beginning of the period of self-isolation. The All-Russian Public Movement «Medical Volunteers», the All-Russian People's Front and the Association of Volunteer Centers organized the action. The #МыВместе volunteer corps included more than 118,985 volunteers who processed the submitted applications, delivered products, medicines and essentials [14].

Through the chatbot KyrgyzMigrant.bot you can find the addresses of the necessary organizations, learn about the necessary documents or get legal advice. The chat works in Kyrgyz and Russian, and is designed to provide psychological support to those affected by the coronavirus pandemic, as well as legal advice on labor migration. Since the launch of this project in August 2020, a significant number of migrants have received legal and psychological assistance. This chatbot on Telegram was created by the NGO Resource Center for the Elderly with the support of the USAID Safe Migration in Central Asia project implemented by Winrock International. The USAID Safe Migration in Central Asia project aims to combat trafficking, protect victims of trafficking, and promote safe migration. Winrock International in all five Central Asian countries implements the project: Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan and Tajikistan [15].

Chatbots can support users on their own schedule, not on their provider's schedule. This is a significant added value in an area where so much work takes place in the patient's daily life, outside the therapist's office. However, mental health chatbots are most effective in the area of accountability, reminding users of the need to apply the mental health strategies they have learned. Initial analysis, diagnosis and training are still best performed under the supervision and guidance of a qualified mental health professional [8].

To better understand what chatbots have more: benefits or harms – we will make a table of some advantages and disadvantages of these chatbots psychological help based on 15 criteria for analysis (Tab. 1).

Based on these tables, we can draw the following conclusions: only six chatbots out of nine use the scientific work of psychologists, whose experience provides assistance. In addition, five of these chatbots use the interlocutor's message database for self-study, and two of them have the constant support of psychologists from the psychological care center, because they do not use any of the bases for fully independent functioning.

Table 1. Advantages and disadvantages of psychological help chatbots

Chatbot's name	Woebot	Wysa	iCognito	Elomia	Eli	Replik a	Mood path	#МыВместе	KyrgyzMigrant.bot
Advantages and disadvantages	2	3	4	5	6	7	8	9	10
1. Chatbots usage the scientific developments of psychologists, whose experience provides assistance	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
2. The interlocutor's message database usage for self-study	Yes	Yes	No	Yes	No	Yes	Yes	No	No
3. Having genuine psychological analyzer certification	No	No	No	No	No	No	Yes	No	No
4. Having their own platform that can be downloaded to a mobile phone, tablet or PC, or are based on messengers and social networks (VKontakte, Telegram, Viber and Facebook)	Yes	Yes	Yes	No	No	Yes	Yes	No	No
5. How many languages do they support	1	1	1	1	1	1	2	1	2
6. On what principle are built – a strict story line (SSL), where it is impossible to deviate from the topic, or ask a non-standard	SSL	UD	SSL	UD	SSL	UD	UD	SSL	SSL

Continuation of Table 1.

1	2	3	4	5	6	7	8	9	10
question, or with the help of unique dialogues (UD), which the neural network forms with AI individually for each "interlocutor"									
7. Providing their communication completely free of charge (F), offering to issue a paid subscription (P) or purchasing certain functions (PCF)	PCF	PCF	F	P	F	PCF	PCF	F	F
8. Able not only help psychologically, but also perform other functions, in particular, entertain the interlocutor with a simple "friendly" conversation, provide advice in other areas of life or help choose a movie, restaurant, place for dinner, etc.	Yes	No	No	Yes	No	Yes	Yes	No	Yes
9. Having the constant support of psychologists of the center for psychological assistance	No	No	Yes	Yes	Yes	No	No	Yes	No
10. Able to recognize only text (T) or able to perceive oral speech or emoji (E)	T	T	T	T	T	E	T	T	T
11. Represented on social networks	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
12. Focus on certain socio-demographic groups	No	No	Yes	No	Yes	No	No	No	Yes
13. Working exclusively in the format of psychological support (PS), or offering solutions to problems (SP), but are advised to turn to professionals for more in-depth analysis and assistance	SP	PS	PS	SP	SP	PS	PS	SP	SP
14. Creating a feeling of communication with a real person	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
15. Able to be used in Ukraine.	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Source: authors' own development

Based on that table, we can draw the following conclusions: only six chatbots out of nine use the scientific work of psychologists, whose experience provides assistance. In addition, five of these chatbots use the interlocutor's message database for self-study, and two of them have the constant support of psychologists from the psychological care center, because they do not use any of the bases for fully independent functioning.

Only one application of all considered has the certification of a truly psychological analyzer – Moodpath. All other chatbots work either exclusively in the format of psychological support (4 appendices), or offer solutions to problems, but advise to turn to professionals for more in-depth analysis and assistance (4 more appendices). Four bots can switch to a psychologist; five others do not give such an opportunity through applications.

Five applications have their own platform that can be downloaded to a mobile phone, tablet or PC, but the other four based on messengers and social networks (VKontakte, Telegram, Viber and Facebook). Among them, 4 chatbots provide their communication completely free of charge, 4 – offer a paid subscription or purchase certain features. Only one application gives only a week of the free version, and then offers to buy a paid subscription on different terms. Most – seven chatbots – support only one language: Russian or English, depending on the development platform. Two applications support two languages: Moodpath is available in English and German, and KyrgyzMigrant.bot – in Russian and Kyrgyz.

Applications are built on two principles. The first is a strict plot line, where it is impossible to deviate from the topic or ask a non-standard question; the bot sends only the questions set by the algorithm and leads to a specific decision tree. The second option is unique dialogues, which the neural network forms with the help of AI individually for each "interlocutor". The first type is used by four applications, the other five use a unique communication format. In addition, according to reviews, seven apps create a sense of communication with a real person, and only two chatbots leave an understanding of communication with foreign investment.

Three applications target specific socio-demographic groups: Lisa from iCognito helps people who are in a relationship, more often in a marriage; Eli's bot is aimed at helping teenagers, and KyrgyzMigrant.bot is designed for Kyrgyz migrants in the Russian Federation.

Five applications can not only help psychologically, but also perform other functions: entertain the interlocutor with a simple "friendly" conversation, provide advice in other areas of life or help choose a movie, restaurant, place for dinner and more. One bot is even able to recognize the language and also answer aloud, analyze, understand a joke from the Internet and send another joke in response (or the first), send emoji according to the mood of the conversation.

Seven applications are presented on social networks: on the pages or in groups you can find standard questions or ask for technical support, if there is no response to the requests in the application or it is not possible to send them at all.

In total, eight out of nine applications can be used in Ukraine. One chatbot – Eli – is unavailable due to the blocking of the social network VKontakte in our country.

If you evaluate by each criterion, assigning one point "advantages" and 0 points "disadvantages", the most convenient and high-quality chatbots can be called Elomia and Moodpath: they have 9 advantages out of our selected 15.

Conclusions

Current trends in technology have a significant impact on everyday life. The advent of chatbots has facilitated many areas of e-commerce: service, education, legal services, sales, online shopping and even medicine. A special type of chatbots are those that provide psychological assistance. Early clinical studies have shown that chatbot technology can play an important role in treating mental health problems. There are technologies that work because of their own applications and those that use existing systems. Among the chatbots considered which have the function of providing psychological assistance, two stand out: the European-certified chatbot Moodpath and last year's Ukrainian development – Elomia, which gives pride to Ukrainian scientists and developers.

For psychological care providers, chatbots can be a valuable tool for freeing up professionals' time and reassuring patients that their needs will be met, even if a human specialist is not available immediately. In addition to reducing costs and increasing productivity, chatbots can optimize customer satisfaction. After all, chatbots are more successful in coping with repetitive tasks, unlike humans. Repetition can cause boredom, laying the groundwork for distractions and mistakes, so even experienced psychologists can make mistakes when performing repetitive routine tasks. Chatbots, if properly programmed, cannot be boring – a trait that can help alleviate the problems caused by human error. Chatbots can support users on their own schedule, not on their provider's schedule. This is a significant benefit in an area where so much work takes place in the patient's daily life, outside the specialist's office.

Chatbots benefit from the same knowledge as regular software applications. The difference is that chatbots can simplify the use of these applications and navigation, as they can use the immediacy of human communication.

Nevertheless, mental health chatbots are most effective as accountability tools, reminding users of the need to apply the mental health strategies they have learned. For initial analysis, diagnosis and training, it is still best to consult a qualified mental health professional.

Thus, the proliferation and implementation of chatbots in many areas of e-commerce has occurred through the desire to use them, the transition to what can provide flexibility and obvious, measurable success for business and users. Companies that want to survive and stay profitable, expand the prospects of attracting users, have no choice but to accept future trends in e-commerce, one of which is the introduction of chatbots.

Abstract

Implementation and configuration of chatbots is one of the promising areas of e-commerce development since 2016. Chatbots are automated programs based on artificial intelligence that mimic communication with real people. In previous years, many of the benefits of artificial intelligence have not yet been realized in e-commerce, but due to Covid-19 in 2020, the situation has changed significantly. Concepts such as artificial intelligence, automation and chatbots have become important in e-commerce to ensure the safe and efficient operation of businesses in all its areas.

A special type of chatbots are those that provide psychological assistance. The peculiarities of introduction and application of a number of chatbots on mental health are considered in the work: Woebot, Wysa, iCognito, Elomia, bot Eli, Replika, Moodpath, MyTogether, KyrgyzMigrant.bot. There are also 15 criteria for analyzing their advantages and disadvantages, namely:

- chatbots usage the scientific developments of psychologists, whose experience provides assistance;
- the interlocutor's message database usage for self-study;
- having genuine psychological analyzer certification;
- having their own platform that can be downloaded to a mobile phone, tablet or pc, or are based on messengers and social networks (vkontakte, telegram, viber and facebook);

- how many languages do they support;
- on what principle are built – a strict story line, where it is impossible to deviate from the topic, or ask a non-standard question, or with the help of unique dialogues, which the neural network forms with ai individually for each "interlocutor";
- providing their communication completely free of charge, offering to issue a paid subscription or purchasing certain functions;
- able not only help psychologically, but also perform other functions, in particular, entertain the interlocutor with a simple "friendly" conversation, provide advice in other areas of life or help choose a movie, restaurant, place for dinner, etc.;
- having the constant support of psychologists of the center for psychological assistance;
- able to recognize only text or able to perceive oral speech or emoji;
- represented on social networks;
- focus on certain socio-demographic groups;
- working exclusively in the format of psychological support, or offering solutions to problems, but are advised to turn to professionals for more in-depth analysis and assistance;
- creating a feeling of communication with a real person;
- able to be used in Ukraine.

Among the chatbots considered which have the function of providing psychological assistance, two stand out: the European-certified chatbot Moodpath and last year's Ukrainian development – Elomia, which gives pride to Ukrainian scientists and developers.

Among the main benefits of using chatbots are:

- chatbots can be a valuable tool for freeing up the time of professionals and assuring clients that their needs will be met, even if the human specialist is not available immediately;
- chatbots can optimize customer satisfaction, effectively reduce costs and increase productivity;
- chatbots cope better with repetitive routine tasks, unlike people, because they do not get bored and do not make mistakes, if properly programmed;
- chatbots can support users on their own schedule, not on their provider's schedule, and so on.

It has been determined that the effectiveness of chatbots on mental health is still within the scope of their use as tools of accountability and control over the application of the studied strategies.

It is outlined that for the perspective and profitable activity of enterprises in all spheres of e-commerce it is obligatory to adopt and implement the main directions of its development: automated control systems, artificial intelligence, chatbots, etc.

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