

## THE APPLICATION OF ARTIFICIAL INTELLIGENCE BASED TOOLS IN MARKETING ACTIVITIES

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**Purpose:** The aim of the article is to identify and verify whether and to what extent natural persons can use publicly available tools using artificial intelligence to conduct marketing activities for micro and small enterprises.

**Design/methodology/approach:** To develop the article, the methods of literature review, case study, "Chat GPT-4o", "Chat GPT 3.5" and the "Magic multimedia" function available in the "Canva" application were used.

**Findings:** Our own research has shown that AI functions in the versions available to all users are able to correctly predict market trends in a short period of time and support the design of graphics convincing people to purchase products based on fragmentary data.

**Research limitations/implications:** The use of artificial intelligence in predicting market trends, customer service and advertising personalization is available to individual users and micro and small entrepreneurs. However, publicly available basic tools may not be sufficient when competing with large enterprises on the market. They should be treated with limited trust and as an inspiration for action.

**Practical implications:** Identification and indication of tools and their effectiveness in forecasting market trends, customer service and advertising personalization.

**Original/value:** The article can help individual users and micro and small entrepreneurs in identifying tools using AI to support marketing activities.

**Keywords:** artificial intelligence, marketing communication, customer service, forecasting market trends, advertising personalization.

**Category of the paper:** Research paper.

### 1. Introduction

In recent years, a significant increase in the importance of modern technologies has been observed, especially in the field of Artificial Intelligence tools (in short AI). The European Parliament's definition of AI (European Parliament, 2023) is the ability of machines to demonstrate human skills such as understanding, learning, planning and creativity.

It has revolutionized many fields of science, including marketing. Artificial intelligence offers a wide range of possibilities thanks to which companies can precisely personalize content for customers, effectively manage customer relationships in real time and predict future market trends. The issue of using artificial intelligence in marketing activities has been dealt with by various researchers (Matz et al., 2024; Peruchini et al., 2024; Yang et al., 2021; Esch, Black, 2021; Davenport et al., 2020; Arsenijevic, Jovi, 2019) pointing in his works to, among other things, more precise identification of customer needs, matching the language and content of messages to the psychological profile of the recipient, converting the available customer base via social media, or creating highly personalized experiences for customers.

Currently, advertising personalization has become a key element of marketing activities because the most creative and best-tailored ads are able to attract their attention more effectively and more successfully encourage them to purchase the advertised product or service. All this is possible thanks to data analysis and machine learning algorithms that can be trained using enormous amounts of appropriately labeled data (WBT-IT, 2020).

In terms of forecasting market trends, AI is also able to effectively support the activities of entrepreneurs. AI systems can isolate patterns, relationships and trends that might not be possible for humans to notice or would take a much longer time. Based on the information and data entered, artificial intelligence can generate forecasts about what various sectors of the economy may look like in the future. Knowing what trends may prevail in given sectors in the future, companies have the opportunity and time to adapt their reactions and actions to the expected reality.

Artificial intelligence has also found its application in customer service, due to its ability to process, store and use enormous amounts of data. It has become particularly important in industries where maximum adjustment to the customer and personalization of content are crucial to achieving the expected sales results. Moreover, most processes can be performed automatically thanks to chatbots, recommendation systems or emotion and sentiment analysis tools (SeoHost, 2024).

The aim of this article is to check from the perspective of an ordinary user how he can use the potential of artificial intelligence to predict market trends, personalize advertising and customer service. This may become a milestone for micro-enterprises and entrepreneurs just starting their business who do not have huge share capital at their disposal and are forced to use publicly available and budget solutions.

## **2. AI in marketing activities**

In the following parts of the article, each of the three aspects of using AI tools for marketing activities mentioned in the introduction will be discussed in more detail, i.e., the use of artificial intelligence in advertising personalization, forecasting market trends and customer service.

## 2.1. Advertising personalization

Mass media undeniably have a significant impact on how reality is perceived. A starting point and a humorous example may be the story presented by Peter Winterhoff-Spurk (2007, p. 128), where it was described how a man spent too much time watching television and tried to "switch" the villains who wanted to harm him to another program.

Ever since artificial intelligence appeared, its importance has been increasing significantly in creating advertising content, which was always intended to have the intended impact on the recipient by, among other things, persuading a favorable opinion about a product or service. The undoubted advantage of AI, according to Mariola Kolará ([https://nakatomi.pl/...](https://nakatomi.pl/), 2023), is the fact that it can store, analyze and use huge amounts of data on an ongoing basis, which can be used to create an advertisement perfectly tailored to what the recipient wants to see at a given moment. This is thanks to machine learning. Stuart Russell and Peter Norvig (2023, p. 9) distinguish three types, depending on the type of feedback between the elements of the input data: supervised learning, unsupervised learning, and reinforcement learning. Broadly speaking, these are developed algorithms and models that allow machines to "learn" from examples. As more examples are introduced, the efficiency and performance of machines increases and improves. We should also mention the so-called computer vision, which allows machines to understand graphical information (Mamczur, 2020). It deals with the automatic understanding and analysis of images and visual signals, with the aim of enabling machines to interpret visual data in a way like humans. Applications include object recognition, motion detection and tracking, and 3D reconstruction.

Machine learning continues to develop its capabilities, thanks to which user data can be constantly updated and used to create or display content that becomes increasingly tailored to the user with each attempt. This is crucial in today's reality in which the user is bombarded from all sides with various offers of products and services. However, thanks to the use of AI tools, there is an increased chance that an offer will be selected that is best suited to current needs. Companies understand very well how important it is to adapt to the user's preferences as closely as possible.

A particularly good example of the above-mentioned activities may be the streaming service "Netflix". At the end of March 2024, it served 269.6 million users (Zielińska, 2024), which makes it the largest website of this type in Poland and in the world (Persona, 2024). It has algorithms that, using information about what productions the user has recently watched and how he rated them, recommend what he should watch next. However, this is not the most advanced personalization activity. Since 2018, Netflix has been able to adjust the covers of the titles displayed to the recipient so that what he or she sees is as absorbing as possible (Borzechowski, 2018). This means that at the same time, the user can see a different movie cover on his/her device than on the device of a person who is not similar in terms of preferences. So Netflix seems to be cleverly and successfully using the message of Henry Ford, founder of Ford Motor Campaign: "If there is any secret to success, it lies in the ability to take the point of view of others and look at things from both the other person's perspective and your own".

## 2.2. Forecasting market trends

For a business to survive and be profitable, it is important to effectively gain and constantly increase an advantage over the competition. Following the words of Bill Gates, co-founder of Microsoft, "The business of every company begins and ends with an in-depth analysis of numbers. Regardless of what a company does, if it cannot draw conclusions from the facts about its own operations and makes decisions based on entrusted information or intuition, it will pay a high price". The need to predict what will happen in the future comes to mind. Not so long ago, this was possible only thanks to magic, but now, with the current level of development of artificial intelligence, it is becoming more possible to achieve. Following Szymon Machniewski (2023), this already allows companies to better plan marketing strategies, prepare future offers, but also to skillfully manage resources in a much faster and more effective way.

Artificial intelligence can automate the analysis of huge Big Data sets containing historical and current information from every area of an organization's operations. Predictive analysis, i.e., predicting future market trends, is possible thanks to machine learning, deep learning, and sentiment analysis. However, the analysis of the same amount of input data by a human could take an incomparably longer time than by a machine, and the result could not be as satisfactory. Therefore, the participation of AI in this area of organizational activity is important, because when trying to predict what may happen without appropriate resources and knowledge, the result may turn out to be worse than when intuition was the only determinant (Questionpro, 2024).

Walmart is a good example of a company's activities in the field of predictive analytics. It is an American supermarket chain founded in 1962 by Sam Walton. This giant uses AI tools to predict how demand will behave. This is helpful and allows the entrepreneur to prepare for situations that deviate from the norm (Torres, 2022). However, what is important, the capabilities that Walmart currently has are the result of many years of data collection, which may be unattainable for companies just starting their operations and entering the market.

## 2.3. Customer service

According to a 2017 study by Gartner, over two-thirds of marketers believe that their companies compete primarily in customer service (Pemberton, 2018). This means that this is an especially important scope of activity of every organization. The conclusions also explain the fact that systems and solutions designed to neutralize as much as possible the customer's unpleasant experiences in the process of using the company's services and to establish a relationship with the customer will make him willing to return to the company. This applies not only to the service sector, but also to all others.

Companies are aware of the importance of this aspect, and this is the reason newer technologies are being introduced into customer service, including those based on artificial intelligence. It allows you to significantly shorten customer service time, systematize the purchase process and filter potential long-term customers more efficiently. According to the

fourth edition of research conducted by Armatis (2022), customers expect fast (48%) and multi-channel (37%) service, as well as the possibility of contact around the clock (28%). Interestingly, as many as 27% of respondents showed a willingness to use more options to manage matters on their own. However, the same research shows that only 1% of respondents were most willing to use the services of bots. However, this indicates the direction of future research and the potential for the development of customer service bots, the operation of which could be as close as possible to what a human has to offer, and then customers will gradually change their preferences. These studies also indicate that the largest percentage of respondents prefer talking to a person by phone (30%), chatting with him (13%) or e-mail (11%). All these activities can be successfully replaced by machines in the future, but every fifth person showed the greatest willingness to talk to a person face to face, which may pose the biggest problem in effectively replacing this activity with a robot.

In customer service, AI can prove useful in many activities and forms. The first and most popular method are chatbots that respond to users' messages. Then, product recommendations should be indicated based on the user's previous activity, which are automatically processed and analyzed thanks to natural language processing (NLP) systems. This action translates into better problem solving and responding to customer inquiries, which is further linked to sentiment analysis, in which the machine can recognize human emotions and respond appropriately to them. Personalizing the customer's shopping experience is also becoming increasingly common, which may mean adapting the brand's website to the customer's individual preferences.

An example of a brand that has introduced artificial intelligence into customer service on a large scale is "Symplyhealth" (Maciejewski, 2024). It uses a Salesforce branded product called "Einstein GPT". Unlike common chatbots, which mostly generate simple, previously prepared answers, the "Einstein GPT" technology can understand what the customer has in mind, read emotions, and deliver messages in a satisfactory way, answering the buyer's inquiry, considering the context and the so-called "second bottom".

### **3. Methods: Chat GPT in predictive analysis**

Private individuals, sole proprietorships or micro-enterprises often do not have access to such advanced technologies and solutions as larger competitors on the market with more capital. These units are forced to use tools available to all users. One such tool that is gaining undeniable popularity is "Chat GPT", which can generate answers to questions asked by the user in a truly brief time. The author's own research in this article consisted in verifying the answers obtained from Chat GPT to questions related to the situation in various markets. The project included a question about the current situation and forecasts for the next month.

Four Polish sectors were examined:

- banana market,
- hairdressing market,
- on-ear headphones market,
- cafe market.

The first part of the study took place on May 9, 2024, in which questions were asked about the trends that will prevail in the above-mentioned markets in a month.

The second stage of the research took place on June 10, 2024, where Chat GPT was also asked about the situation in a month and the current situation in selected sectors.

The third stage on July 4, 2024, included a question about the current situation.

The responses obtained are presented in tables 1 to 8. The summary of responses from Chat GPT includes predictions with the actual situation as of the expected date. The "x" means that Chat GPT did not cover this topic in one of its answers and did in the other one. Analyzing individual selected markets, the banana market (see table 1 and table 2) shows what trends, according to Chat GPT, were to prevail on the banana market in Poland a month after the survey was carried out and how, according to him, they looked like after that time.

**Table 1.**

*Answers obtained from Chat GPT in the banana market - measurement 1*

<b>As of May 9 (question: What trends will prevail on the banana market in a month in Poland)</b>	<b>As of June 10 (question: What trends are currently prevailing on the banana market in a month in Poland)</b>
the stability of supplies may depend on weather conditions in banana-producing countries	x
an increase in the costs of banana production may result in an increase in banana prices	increase in prices
increased interest in fair trade and ecological products	increased consumer interest in fair trade and organic products
stores may organize sales, which will lead to a short-term increase in demand	x
the availability of alternative seasonal fruits may reduce demand for bananas	x
x	increased supply of bananas

Source: Own development using <https://chatgpt.com/>

The same operation was repeated after a month, as shown in Table 2.

**Table 2.***Answers obtained from Chat GPT in the banana market - measurement 2*

<b>As of June 10</b> <b>(question: What trends will prevail on the banana market in a month in Poland)</b>	<b>As of July 4</b> <b>(question: What trends are currently prevailing on the banana market in a month in Poland)</b>
price fluctuations due to seasonality	x
prices fall due to increased supply	x
increased consumer interest in fair trade and organic products	the growing popularity of fair trade and organic products
promotions and marketing activities in retail chains and supermarkets - short-term increase in sales	supermarkets organize promotions for bananas, which increases sales
price increases caused by unforeseen weather conditions in banana producing countries, changes in transport prices and inflation	price increases caused by climatic conditions and transport prices
stable demand in relation to consumer preferences	x
x	increased emphasis on maintaining the good condition of bananas during the transport process
x	increased consumer demand for different varieties of bananas
x	increased demand for ecological banana packaging or lack of packaging

Source: Own development using <https://chatgpt.com/>

The GPT chat was not asked about specific issues, but the ones it raised were consistent with each other in both cases.

The hairdressing market (see table 3 and table 4) shows what trends, according to Chat GPT, were to prevail on the hairdressing market in Poland a month after the experiment was performed and what, according to him, they looked like after that time.

**Table 3.***Answers obtained from Chat GPT in the hairdressing market - measurement 1*

<b>As of May 9</b> <b>(question: What trends will prevail on the hairdressing market in a month in Poland)</b>	<b>As of June 10</b> <b>(question: What trends are currently prevailing on the hairdressing market in a month in Poland)</b>
the hairstyles will be inspired by social media	x
natural and simple hairstyles	x
increased popularity of coloring, especially with ecological dyes	increased interest in ecological products
increased popularity of care services	interest in care services is growing
introducing new solutions by hairdressers	modern solutions are increasingly introduced into hairdressing salons
high customer requirements regarding hygiene standards	x
popularity of online booking of services	increasing introduction of online booking options, mobile applications, and social media
x	increased demand for personalized services and consultations
x	they practice loose hair styling
x	increased demand for barber services
x	hairdressers are increasingly willing to invest in their development
x	more salons are getting involved in sustainable development

Source: Own development using <https://chatgpt.com/>

The same activity was repeated after a month, and the results obtained are presented in Table 4.

**Table 4.**

*Answers obtained from Chat GPT in the hairdressing market - measurement 2*

As of June 10 (question: What trends will prevail on the hairdressing market in a month in Poland)	As of July 4 (question: What trends are currently prevailing on the hairdressing market in a month in Poland)
choosing lighter and airy hairstyles due to the summer season	x
increased promotion of hair care services by hairdressers due to elevated temperatures	offering additional care services by hairdressing salons
increased popularity of ecological products among customers	choosing ecological products is becoming more common
increased customer expectations regarding solutions used by hairdressers (new technologies)	increased use of modern technologies
increased interest in barbering services for men	barbering services
customers are looking for natural and easy-to-maintain coloring solutions	customers are increasingly choosing natural and subtle coloring solutions
application of strict hygiene rules	increased hygiene and safety standards
hairdressers investing in development and training	the increasing importance of training and improving qualifications for hairdressers
increased marketing activities by hairdressers	the increasing role of marketing in hairdressing services
increased demand for personalized services	increased demand for personalized services
x	increased popularity of mobile services (in clients' homes) offered by hairdressers

Source: Own development using <https://chatgpt.com/>

Chat GPT was not asked about specific issues, but the ones it raised were consistent with each other in both cases. Moreover, in the case of this market, he pointed out more related topics in the first and second cases. This may suggest that, depending on the market, Chat GPT will be precise. Importantly, to obtain interesting and useful answers, you should ask questions as precisely as possible.

The over-ear headphones market (see Table 5 and Table 6) shows what trends, according to Chat GPT, were to prevail on the over-ear headphones market in Poland a month after the experiment and what, according to him, they looked like after that time.

**Table 5.**

*Answers obtained from Chat GPT in the on-ear headphones market - measurement 1*

As of May 9 (question: What trends will prevail on the on-ear headphones market in a month in Poland)	As of June 10 (question: What trends are currently prevailing on the on-ear headphones market in a month in Poland)
the increase in popularity of wireless on-ear headphones	the increase in popularity of wireless headphones
the increasing popularity of headphones with active noise reduction	headphones with active noise cancellation are more desirable
greater demand for headphones with built-in voice assistants (Siri, google assistant)	more models offer integration with voice assistants
concentration of producers not improving sound quality	consumers are increasingly paying attention to the high sound quality of devices



Cont. table 5.

paying more attention to design and comfort by customers	wearing comfort has become a key factor when choosing headphones, and style is also important when choosing
growing interest in gaming headphones	development of models intended for gamers
premium headphones with advanced features and high sound quality	premium brand headphones
increased interest among customers in multifunctional headphones	x
x	greater demand for headphones with long battery life
x	consumers' ecological awareness influencing purchasing decisions of headphones

Source: Own development using <https://chatgpt.com/>

The same operation was repeated after a month, as shown in table 6.

**Table 6.**

*Answers obtained from Chat GPT in the on-ear headphones market - measurement 2*

<b>As of June 10</b> <b>(question: What trends will prevail on the on-ear headphones market in a month in Poland)</b>	<b>As of July 4</b> <b>(question: What trends are currently prevailing on the on-ear headphones market in a month in Poland)</b>
seasonal promotions and sales in connection with the summer period	x
presentation of new models and technologies by brands	x
development of voice assistant technologies integrated with devices	increased interest in headphones with intelligent functions, including voice assistants
marketing campaigns related to preparing for the next school year	x
introducing more ecological solutions (ecological materials from which headphones are produced)	increasing user awareness and choosing models made of ecological materials
continuous increase in the popularity of gaming headphones among customers	x
you can expect that manufacturers will introduce headphones with a sound personalization function	x
further development of wireless headphone models	the importance of wireless headphones continues to grow
the growing importance of comfort and ergonomics among customers	the height and aesthetics of the headphones are crucial to customers
increased importance of reviews and user opinions, e.g., on YouTube	x
x	headphones with active noise cancellation are more desirable
x	increased interest in models with high sound quality
x	the increasing importance of multifunctionality of on-ear headphones

Source: Own development using <https://chatgpt.com/>

The GPT chat was not asked about specific issues, but the ones it raised were consistent with each other in both cases. Moreover, it can be said that in the discussed case Chat GPT performed worse due to the smaller number of overlapping topics. This may mean that he paid more attention to other aspects, assuming, that the aspects discussed were more important than others.

The coffee shop market (see Table 7 and Table 8) shows what trends Chat GPT believed would prevail on the coffee shop market in Poland a month after the experiment was performed and what, according to Chat GPT, they looked like after that time.

**Table 7.**

*Answers obtained from Chat GPT in the cafe market - measurement 1*

<b>As of May 9</b> <b>(question: What trends will prevail on the coffee shop market in a month in Poland)</b>	<b>As of June 10</b> <b>(question: What trends are currently prevailing on the coffee shop market in a month in Poland)</b>
cafes will introduce seasonal coffees, including iced coffees	x
the use of alternative methods of making coffee by cafes	x
introduction of various teas to the offer	consumers are increasingly willing to reach for alternative drinks such as tea
offering dairy alternatives (vegan and plant-based)	x
ecological activities introduced into the cafe's operations	actions for sustainable development are increasingly undertaken by cafes
continuation of the development of online cafes (offering e.g., home coffee delivery services)	the increasing importance of online coffee shops
cafes can offer coffee from small artisan plantations	increasing popularity of coffees from local small farms
increased interest in sensory experiences among customers (such as coffee tasting)	customers focus on the possibility of tasting or taking part in coffee-making workshops
promoting your business by cafes on social media	x
x	increased interest in various coffees from around the world
x	increasing the importance of the aesthetics of the cafe interior for customers
x	development of the concept of hybrid cafes that, for example, are also bookstores
x	cafes are increasingly introducing the latest technological solutions, such as mobile applications

Source: own development using <https://chatgpt.com/>

The same activity was repeated after a month, as can be seen in table 8.

**Table 8.**

*Answers obtained from Chat GPT in the coffee shop market - measurement 2*

<b>As of June 10</b> <b>(question: What trends will prevail on the coffee shop market in a month in Poland)</b>	<b>As of July 4</b> <b>(question: What trends are currently prevailing on the coffee shop market in a month in Poland)</b>
introduction of seasonal menus by cafes	customers are looking for diversity, including other flavors
increasing the takeaway offer and taking care of the garden for customers	x
cafes may introduce variable opening hours depending on the lifestyle of customers	x
introducing new technological solutions by cafes	introducing new solutions and technologies by cafes
paying great attention to hygiene and safety	x
cooperation with local suppliers	the increasing importance of local products
organization of interesting meetings and events in cafes	increased demand for educational meetings about coffee
supporting ecological activities	supporting ecological and sustainable development activities

Cont. table 8.

creative marketing strategies (competitions, cooperation with influencers)	x
growing your online business	x
x	demand for high-quality coffee
x	cafes try to provide the most comfortable conditions for meetings and work
x	emphasis on high-quality coffees

Source: Own development using <https://chatgpt.com/>

For the coffee shop, Chat GPT generated responses with similar efficiency to the over-ear headphones.

To sum up, in most cases the predictions came true or differed slightly from the actual situation. It is worth noting, however, that in many cases the topics discussed by Chat GPT did not overlap at all. This may mean that in the future, when using this tool to predict events in a real company, it may be better to ask questions more precisely, because in the case of the project in question they were asked in a general form. It is worth mentioning that GPT Chat's predictions should be read with a certain amount of limited confidence and not uncritically respect all of its answers and indications, because they may often be imprecise, which may result in poor or incorrect understanding. As you can see and read while using the tool: "Chat GPT may make errors." However, this is undoubtedly an interesting way to verify your own assumptions and provide additional support in the absence of other available solutions. Work on GPT Chat and improvements to subsequent versions are ongoing. In May 2024, its updated version premiered, available to all users. This may mean that an even more effective tool will be available in the future. It is also important that during our own research, it was carried out at a breakthrough moment, considering two versions of Chat GPT: "Chat GPT-4o" and "Chat GPT 3.5", which may be a certain limitation of the procedure.

#### 4. Results: Personalization of graphics based on general data

The next stage of our own research included the process of personalizing graphics based on general data. The research was conducted based on graphics generated by artificial intelligence, considering the "Magic Multimedia" function available in the "Canva" application. The research included four groups of recipients:

- Men from the Baby boomer and X generations.
- Women from the Baby boomer and X generations.
- Men from generations Z and Y.
- Women from generations Z and Y.

The entered formulas were intended to generate graphics encouraging the purchase of a pen, a car, a house, and milk for each of the indicated recipient groups by artificial intelligence. Examples of generated suggestions for the milk category are presented in figure 1.



**Figure 1.** Examples of graphics generated by AI aimed at encouraging the purchase of milk.

Source: own study using the "Magic Multimedia" tool in the Canva application.

Based on information about the user's generation and gender, AI generated graphics that would potentially best encourage them to purchase the product. The way the question was constructed was determined by the fact that in a situation where the author is an ordinary user or a small entrepreneur, he often does not have tools to collect more data about product users. Questions for the graphics generating mechanism were created based on the question pattern: "Create a graphic for a woman/man from the generation.... which will encourage you to buy...." The graphics were generated based on fragmentary data about the potential customer.

The resulting graphics were presented to respondents who were asked to participate in the online survey. Sixty respondents took part in the study, including forty-four women and sixteen men. The study aimed to check whether, based on a small amount of information, it is possible to generate graphics supported by AI that are significantly effective in persuading specific groups of people to purchase various products.

The following tables 9, 10, 11 and 12 will present the answers obtained aggregated in specific groups of respondents, representatives of two characteristics: gender and age. "Option 1" in each case (house, pen, milk, car) was a graphic generated for women from Generation Z and Y, "Option 2" for women from Baby Boomers and X generations, "Option 3" for men from Generation Z and Y, and "Option 4" for Baby Boomer and Gen X men.

**Table 9.**

*Research results for respondents from the group: Women, Generation Z and Y*

Graphics subject	Option 1 – dedicated to group	Option 2	Option 3	Option 4
Milk	35%	32.5%	17.6%	15%
Car	12.5%	25%	47.5%	15%
Pen	17.5%	25%	37.5%	20%
House	27.5%	20%	12.5%	40%

Source: Own study based on survey research.

It should be stated that the most convincing graphic turned out to be the one generated for men from generations Z and Y. Therefore, in this case, we can confirm the effectiveness of the graphic in relation to the generation itself, but not to the gender.

**Table 10.**

*Research results for respondents from the group: Women of the Baby boomers and X generations*

Graphics subject	Option 1	Option 2 – dedicated to group	Option 3	Option 4
Milk	25%	25%	0%	50%
Car	0%	0%	75%	35%
Pen	0%	75%	0%	25%
House	0%	50%	0%	50%

Source: Own study based on survey research.

In the case of women from the Baby Boomer and X generations, the graphics aimed at this group and the group of men from the same generation gained the greatest recognition. This confirms the previously noted fact that there is a better fit in terms of generation than gender.

**Table 11.***Research results for respondents from the group: Men, generation Z and Y*

Graphics subject	Option 1	Option 2	Option 3 – dedicated to group	Option 4
Milk	42.9%	35.7%	7.1%	14.3%
Car	21.4%	7.1%	50%	21.4%
Pen	28.6%	7.1%	42.9%	21.4%
House	35.7%	14.3%	21.4%	28.6%

Source: Own study based on survey research.

Men from generations Z and Y were most likely to choose graphics designed for them and women of the same generation. There is no significant advantage in any of these groups, which confirms the previously described relationship.

**Table 12.***Research results for respondents from the group: Men of the Baby boomer and X generations*

Graphics subject	Option 1	Option 2	Option 3	Option 4 – dedicated to group
Milk	0%	50%	50%	0%
Car	0%	0%	50%	50%
Pen	50%	0%	0%	50%
House	0%	100%	0%	0%

Source: Own study based on survey research.

In the case of graphics for men from the Baby Boomer and X generations, it is not possible to state a significant advantage in each case, so this is the only case in which graphics from among the proposals for these generations were not chosen most willingly.

After selecting the graphic variant that was most encouraging in the respondent's opinion, he or she was additionally asked to justify his or her answer. The most common justifications were: "speaks to me", "is the most interesting to me", "is the prettiest".

It should be noted that the option dedicated to AI is never the least frequently chosen option, although other options are often also willingly chosen by respondents. This may mean that in the case of graphics personalization, for the process to be successful, you need to use a different tool or have more data about the recipient for whom the content is created.

## 5. Discussion: Moral threats and dilemmas

When using artificial intelligence in the above-mentioned situations, you should be aware that it involves great responsibility. The above-mentioned activities are also subject to a considerable risk of errors. For AI to successfully support marketing processes, it must have access to the most detailed user data possible. Often, this is information for the possession and use of which it is necessary to obtain the user's consent (GDPR, General Data Protection Regulation), which, due to oversight, may lead to privacy violations and conflicts with the law

(Żarska-Cynk, 2023). It is therefore important to strike a balance between content personalization and user privacy. An aspect that is also worth paying attention to is the fact that the use of AI may lead to even greater market inequality, because larger and more developed companies will have the best available solutions, while smaller ones will only be able to use basic tools. It may result in even greater differences in the preparation of diverse types of personalized content between competitors, and as a result, small businesses will disappear.

Moreover, there is a risk that advertising, even personalized advertising, may function as a manipulative tool that will successfully convince users to purchase products that may be harmful or may lead to excessive consumerism. However, it must also be added that creating advertisements and promotional campaigns has always been burdened with the above-mentioned responsibility. The only variable are the tools used for this purpose.

When predicting market trends using artificial intelligence, it should be noted that the forecast may not be accurate and using it is a choice that may lead to unexpected and negative consequences. As a result of excessive trust in technology, these actions may turn out to be unfavorable. This, in turn, with more companies repeating this practice, may lead to destabilization of financial markets and a crisis.

The use of artificial intelligence in customer service is also accompanied by numerous threats. It may lead to incorrect understanding of the client's intentions and to treating him in an inappropriate way. It is worth mentioning that many people are currently employed in customer service positions, and because of technological development, they may be increasingly replaced by machines. Therefore, an increase in unemployment and, consequently, other negative social effects are likely. In such a situation, it is pertinent to ask whether replacing humans with machines is appropriate, even if it reduces costs and streamlines numerous processes? Is AI able to successfully demonstrate the same empathy and understanding for humans and their problems as a real human?

## 6. Summary

This article examining the role of artificial intelligence in advertising personalization, predicting market trends and customer service highlights several key issues. According to the analysis of literature and the latest studies, AI in advertising personalization analyzes massive amounts of consumer data, which allows for the creation of personalized marketing activities. Thanks to advanced algorithms, accurate customer segmentation is possible, which in turn enables precise matching of the content created and displayed. However, if you only have publicly available tools, personalization is much more difficult, which is a big challenge for micro and small entrepreneurs. To predict market trends, AI uses predictive analysis based on the analysis of market and consumer data. Thanks to this, AI provides strategic

recommendations regarding the introduction of new products, price changes and marketing strategies. However, when it comes to common tools using AI technology, questions should be asked carefully and as precisely as possible, and the obtained data should be treated with a certain distance. In customer service, AI solutions are used in chatbots and virtual assistants that can serve customers 24 hours a day, quickly answering questions and solving problems. Sentiment analysis allows artificial intelligence to understand customer sentiment and needs, which enables quick responses to problems and improved satisfaction. Thanks to AI, customer service becomes more personalized, which increases user loyalty and satisfaction. According to the research conducted, artificial intelligence, even at its current stage of advancement, can significantly contribute to improving marketing activities carried out by entrepreneurs who do not have large resources. When it comes to forecasting market trends, the idea of using artificial intelligence seems to be supportive due to the consistency and accuracy of the answers. This result, however, was obtained after conducting research covering a short period of time, which may have a significant impact on the quality of the response. As for advertising personalization, tables 9, 10, 11 show a certain dependency in the effectiveness of matching for individual generations, while in relation to gender it means that the system, even such a common one, can help in matching marketing communication to the customer based on some data. However, this thesis was not confirmed by Table 12, which means that these conclusions should be treated with some caution, especially considering the limitation of the study, which is the non-representativeness of the obtained samples. Nevertheless, using AI tools to personalize content is helpful and justified. Importantly, development in the field of AI is continuous and it is possible that soon there will be new and more effective tools supporting marketing activities, which will also be dedicated to individual users.

Artificial intelligence is undoubtedly an important and frequently discussed topic by scientists and practitioners. The direction of future research may include checking the effectiveness of artificial intelligence in predicting market trends over a longer period. In the case of advertising personalization, it would be useful to also examine the effectiveness of other platforms helping in generating graphics.

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