

IDENTIFICATION OF AREAS FOR OPTIMISING MARKETING COMMUNICATIONS VIA AI SYSTEMS

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Purpose: The main objective of this article is to identify areas for optimizing marketing communication via artificial intelligence solutions.

Design/methodology/approach: In order to realise the assumptions made, an analysis and evaluation of exemplary implementations of AI systems in marketing communications was carried out. For the purpose of achieving the research objective, it was decided to choose the case study method. As part of the discussion, the considerations on the use of AI undertaken in world literature were analysed, as well as the analysis of three different practical projects.

Findings: AI can contribute to the optimisation and personalisation of communication with the customer. Its application generates multifaceted benefits for both sides of the market exchange. Achieving them, however, requires a good understanding of this technology and the precise setting of objectives for its implementation.

Research limitations/implications: The article contains a preliminary study. In the future it is planned to conduct additional quantitative and qualitative research.

Practical implications: The conclusions of the study can serve to better understand the benefits of using artificial intelligence in communication with the consumer. The results of the research can be used both in market practice and also serve as an inspiration for further studies of this topic.

Originality/value: The article reveals the specifics of artificial intelligence in relation to business activities and, in particular, communication with the buyer. The research used examples from business practice.

Keywords: Artificial Intelligence, Marketing Communication, Machine Learning, Big Data, New Technologies

Category of the paper: Technical paper, Conceptual paper.

1. Introduction

The dynamic development of information and communication technologies (ICTs) is having a significant impact on the functioning of modern businesses. The transformation, which takes place through digital systems, in its main intentions is to result in increasing the efficiency of processes and enhancing productivity, resulting in raising the standard of living of society (Ebert, Duarte, 2020; Vial 2021). The multidimensionality of the changes taking place in the enterprise under the influence of the spread of solutions such as artificial intelligence, the internet of things, or virtual reality is an important research subject (see: Dornberger, 2018; Bajak, 2021; Naqvi, 2021). In fact, progressive digitalisation affects almost all dimensions and aspects of the functioning of market institutions. Indeed, modern technologies improve, for example, production, logistics, marketing, management, or financial processes (eg. Liu et al., 2019; Tadapaneni, 2019; Żabińska, 2020; Raisch, Krakowski, 2021; Bajak, 2022). At the same time, the development of systems, that can be described as SMART, reinforces integration of a horizontal and vertical nature between different company departments (Patel, Ali, Sheth, 2018; Miśkiewicz, 2019; Yang, Gu, 2021), which enables, in effect, the creation of increasingly efficient, safe, cost-effective and environmentally friendly solutions. These are predominantly based on using data extracted from the environment to generate value from it (Nguyen, Zhou, Spiegler, Ieromonachou, Lin, 2018; Romaniuk, 2020). In this area, the fundamental challenge is therefore to create systems that automate data processing and, on this basis, monitor, control and optimise company processes.

The main objective of this article is to identify areas for optimizing marketing communication via artificial intelligence solutions. In order to realise the assumptions made, an analysis and evaluation of exemplary implementations of AI systems in marketing communications was carried out. As part of the discussion, the considerations on the use of AI undertaken in world literature were analysed, as well as the analysis of three different practical projects. For the purpose of achieving the research objective, it was decided to choose the case study method.

2. The use of artificial intelligence in the enterprise

The term 'artificial intelligence' was first introduced by John McCarthy at Dartmouth University in 1955 during a meeting with fellow scientists (Warszycki, 2019). He described it as the process "that of making a machine behave in ways that would be called intelligent if humans were so behaving" (McCarthy et al., 1955). The development of such systems and their components like data, computing power, algorithms can lead to a variety of benefits, including

economic ones (Zhang, Cui, Zhu, 2020). AI can thus be defined as a multidisciplinary technology that uses mechanisms for data analysis, integration of cognitive functions and emotion recognition, human-computer interaction, machine learning and decision-making (Lu, 2019). It assumes particular importance in industries where big data analysis is important [such as healthcare, commerce, finance or automotive], which is not without its influence on the main development directions of such systems (Zhang, Lu, 2021).

The subject of artificial intelligence has been gaining in popularity in recent years. As many as 377,529 papers in the Web of Science database have been devoted to it, while 434,754 articles in this area have been classified in Scopus. The most common fields are Computer Science (39.1%), Engineering (16.4%) and Mathematics (15.5%). It is worth noting that the rapid development observed in the aforementioned areas of science further contributes to the growing importance of artificial intelligence. At the same time, machines and programmes using AI mechanisms help to create and discover new relationships between data, which is why AI is being implemented in various areas beyond the sciences and technology, such as economics, medicine or management.

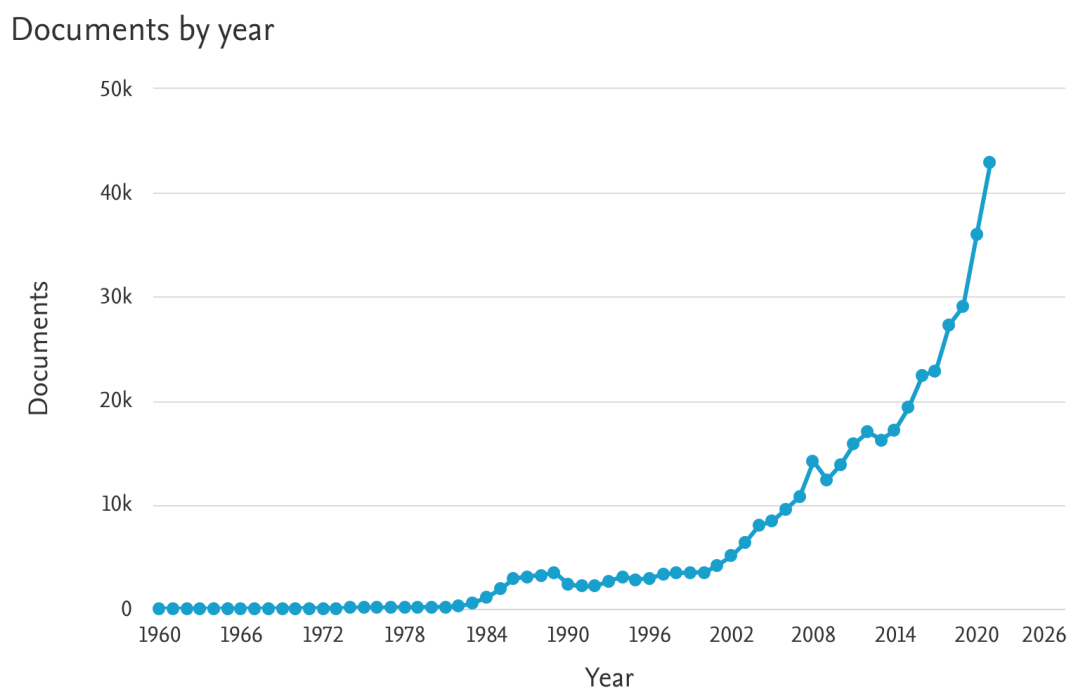


Figure 1. Increase in number of AI related articles in Scopus database. Source: (Scopus, 2022).

The interest in AI shown by a variety of industries has led global leaders in the field of high-tech to take an interest in its application, such as Apple, Amazon, Google, IBM, Facebook and Baidu (McKinsey & Company, Forbes, 2017). Enterprises using AI solutions also include companies from the automotive industry [BMW, Toyota, Tesla] and broader industry (Bosh, ABB, Siemens, General Electric). Their investments have contributed to the dynamic development of AI, which has made the technology increasingly relevant (Bielinska-Dusza, 2020) and finding more and more applications in business (Eriksson et al., 2020). This is a factor in building competitive advantage and can be seen as a kind of catalyst for digital

transformation (Bielinska-Dusza, 2022), which is reshaping existing ways of operating businesses (Cusumano et al., 2020). The following can be identified as the main factors encouraging investment in this area (Wodecki, 2018):

- economic incentives – increased revenues as a result of a wider market and reduced failure rates, as well as lower operating costs,
- new sources of revenue – innovative payment models, as well as new services and products,
- technological advantage – increased predictability of processes, ensuring stability, more efficient use of resources, decreased cost of errors because of their efficient detection,
- regulatory changes – introduction of data protection regulations such as RODO as well as new security standards and requirements, changing economic objectives, implementation of modernisation and development grants,
- industry (market) pressure – rising resource costs, pressure from regulators and aggressive competitive strategies,
- customer pressure – expectation of new solutions and product optimisation by consumers.

Another stimulant that is increasing interest in AI is the cooperation between industry, research and education directed toward the development of this technology. Therefore, this is resulting in growing investment and increased innovation dynamics in this area (Stanford Human-Centered Artificial Intelligence HAI, 2019).

3. Determinants of the implementation of AI systems in a company

Constructing the right business case is often a critical determinant of a company's success in implementing AI. These solutions ultimately aim to streamline decision-making processes and improve communication as a result of information analysis (Rutkowski, 2020). The fundamental element that enables AI mechanisms to achieve the assumptions made is data. This is because they make it possible to understand market phenomena, draw conclusions from them and make decisions (Warszycki, 2019). The results obtained can be used to create new products, services and conquer new markets (Sujata, Aniket, Mahasingh, 2019; Chen, Siau, 2020). Therefore, the implementation of artificial intelligence in a company requires the precise establishment of business objectives, as well as access to data and appropriate tools, together with techniques for their analysis. Equally important is the adaptability of the results obtained and a favourable organisational culture (McKinsey & Company, 2017; Ransbotham et al. 2017). Although these types of systems are costly, their legitimate use has a number of benefits for the organisation, which ultimately contributes to growth. This is because the overriding concern is to increase: revenue, profit, or market share, rather than to reduce expenditure per se

(Wodecki, 2018). However, it is important to keep in mind that the purchase and implementation of artificial intelligence solutions does not guarantee that value will be derived from the venture. Therefore, it is significant to adapt algorithms for one's own range of processes and data, which requires structured data ecosystems and supervision and control of the training (learning) processes of the algorithms. In this area, it is essential to understand the specifics of artificial intelligence mechanisms and controllers (Kietzmann, Paschen, Treen, 2018; Zhang, Lu, 2021):

- Big Data – multidimensional and powerful data sets whose analysis requires the speed and accuracy provided by AI. As a result, they enable comprehensive information and serve to optimise processes and facilitate decision-making.
- Problem Solving and Reasoning – computer algorithms that enable the detection of patterns based on data analysis and thus contribute to problem solving and improve the ability to predict future behaviour.
- Machine Learning – empirical learning based on experience in data analysis. Used to optimise algorithms based on previously memorised data and practices.
- Vision Computing – image recognition as well as object identification, tracking and measurement. Processing the surrounding world into data for understanding by computers.
- Speech Recognition – speech analysis, including both, understanding the meaning of words and the timbre of the voice, as well as the interaction between human and machine language.
- Hardware Platform – the physical devices that provide the material basis for the operation of computer software.

From a business perspective, it is particularly important to practically reference and use these processes for decision-making (eg. Duan, Edwards, Dwivedi, 2019; Ghasemaghaei, 2019; Arnott, 2020), knowledge and skills management (eg. Božič, Dimovski, 2019; Lei, Wang, 2020; Yiu, Yeung, Jong, 2020) and information analytics in a broad sense (eg. Nalchigar, Yu, 2017; Chen, Siau, 2020; Wamba-Taguimdje et al., 2020). At the same time, these mechanisms can be used to optimise communication with the buyer and improve their shopping experience. This responds to the growing need to personalise the dialogue with the customer and contributes to achieving multifaceted benefits for each side of the market exchange. A better understanding of the specific role of AI in consumer communication can be provided by analysing practical implementations of such systems.

4. Methodology

The main objective of this article is to identify areas for optimizing marketing communication via artificial intelligence solutions. In order to realise the assumptions made, exemplary implementations of AI systems in marketing communication were examined. As part of the discussion undertaken, reflections on the application of AI undertaken in the literature were reviewed, as well as an analysis of three different practical projects. This made it possible, in effect, to analyse and evaluate exemplary implementations of AI systems in a variety of business areas. In order to realise the research objective, it was decided to choose the case study method. It is based on a detailed study of the empirical material, which is carried out using secondary or primary data. It is done in order to understand the processes of the discussed phenomenon and to indicate their context (Rashid et al., 2019). Due to the extensive and interdisciplinary nature of the topic under study, it was decided to juxtapose three separate examples with varying specificities. This allowed for the identification of similarities as well as differences between the cases. In the work presented here, the interdependencies between the cases studied were used to identify the main benefits for the company and the consumer resulting from the use of AI solutions in the company.

Due to the dynamic development of technologies in the field of artificial intelligence and their numerous implementations in business, a purposeful selection of the projects examined was made. Prior to the selection, information on outstanding projects was searched for, among other things, on company websites and in trade journals. The following criteria were adopted:

- possibility of dissemination of the solutions used by other institutions,
- innovativeness of the AI mechanisms used,
- prospects for further improvement of the system presented.

5. Practical examples of using AI systems in marketing communication

Three different systems using artificial intelligence (AI) mechanisms were analysed as part of the considerations (Table 1). The general specificity of the projects is shown in the table, which is a common practice when applying this method (Miles et al., 2014). This serves to deepen insights and establish relationships between the cases studied (Halkias, Neubert, 2020). The systems studied have a variety of functions, which nevertheless remain within the field of marketing communications. However, their distinct characteristics result in different benefits for the organisations using them, which provides a broader picture of the specificity of AI.

Table 1.*Overview of the cases studied*

System	Organisation	Area of application	Main objectives of implementation
Watson Assistant	Humana	Customer service	Shortening the time of customer service, obtaining customer's data (customer verification and authorization), relieving employees from routine activities, increasing the efficiency of the team
Seventh Sense	Natera	Email marketing	Optimising email messages, automating the time of sending messages, increasing the open rate and click-through rate
shopDisney	Walt Disney Company	E-commerce	Improving purchase recommendations, increasing sales revenues

Source: own study.

5.1. Humana: Watson Assistant

In the United States, Humana is the leading provider of health insurance. It serves more than 13 million customers nationwide. In order to maintain their high position, companies in this sector are forced to innovate, including constantly improving customer service. When consumers make a phone call, they expect fast and accurate answers to their questions, without taking their circumstances into account. In order to meet customer demands, Humana began looking for call centre automation solutions. To this end, the company began working with global technology giant IBM, which offers numerous AI-based tools. The Watson Assistant tool implemented was tailored to Humana's needs, automating customer service. The solution uses one method of artificial intelligence in the form of a voice assistant, equipped with the ability to convert speech into text. Until now, the calls received by physical consultants were 60% about routine, specific pre-service questions, with definable answers. The artificial intelligence system implemented provides a faster, consistent and more user-friendly way to obtain information, particularly regarding medical qualifications; verification and authorisation without having to speak to a physical agent. The solution has significantly increased the efficiency of customer service staff, relieving them of repetitive and routine activities. Through Humana's extended collaboration with IBM, a joint IBM Data and AI Expert Labs & Learning (DAELL) effort was launched. This resulted in improvements to the Watson system, using customised training and models focused on medical terminology in a lower bandwidth call centre environment. This solution allowed Humana to answer more than 7,000 voice calls per day, significantly increasing the capacity of its existing customer service department (IBM, 2022).

5.2. Natera: Seventh Sense

Natera Inc is a global clinical research leader dedicated to the development and commercialisation of non-invasive DNA analysis methods, with a particular focus on the detection of women's diseases, organs and cancer. The company's mission is to transform the diagnosis and treatment of genetic diseases. Currently, Natera offers a range of genetic testing services in its portfolio mainly in the field of obstetrics and gynaecology, as well as infertility treatment. As a global company, Natera was looking for a unique, efficient solution in the area of marketing communication due to the growing number of its customers worldwide. The company's main objective was to maintain its leadership position, which involved reaching out to new audiences for their services. A relatively traditional marketing method in the form of email marketing proved to be the optimal solution. Due to the demand for more personalised and sophisticated marketing campaigns, innovation in the form of email optimisation and automation was required. Natera, in collaboration with Prism Global Marketing Solution, decided to implement AI-based technology in this area - Seventh Sense and HubSpot. The Seventh Sense system, using artificial intelligence, analyses historical data on customer engagement on previously sent emails, builds a profile of each subscriber and then allows marketers to automatically send campaigns, according to individual customer time preferences. In other words, the system's algorithms are focused on sending emails at the time each subscriber is most likely to read the message and respond to the call to action in it. The Seventh Sense system uses 3 methods of email delivery:

- based on sending time personalisation - using historical data of successful contacts, the system determines the most optimal time to send a message to a given group of recipients within a specified hourly framework;
- based on randomisation of sending time – in the case of new customers, or customers who have not been engaged so far, the system randomly selects the time of sending the message to each of them (between 8:00 and 20:00 Eastern American time). The purpose of this is to determine the appropriate time to send the message to customers not previously engaged, the time they spend browsing their own email inboxes;
- based on sending an e-mail to a so-called control group - it is similar to a traditional batch campaign conducted at random times, but, thanks to data analysis by AI, it is carried out at moments of peak message recipient engagement.

As a result of the Seventh Sense application (mainly through personalisation and randomisation of the timing of messages), Natera generated a combined increase in open rate (OR) and click-through rate (CTR) of 5.1 and 18.1 percentage points, respectively (compared to the control group). Taking into account the personalisation method, the increase in OR was 2.5 percentage points, while CTR was 23.9%. Among new customers, these increases were much higher, as the randomisation method resulted in an open rate 110.6 percentage points higher and a click-through rate 89 percentage points above the control group. In other words,

the AI-based tool brought tangible benefits to the company in the form of significantly higher conversion rates with the customer. What's more, the Natera company increased the number of its new customers by 85% within six months of using the Seventh Sense email marketing optimisation system. In addition to attracting new service recipients, engagement with existing subscribers and customers who were active in earlier years also increased (Natera, 2022).

5.3. Walt Disney Company: shopDisney

The Walt Disney Company is an American media and entertainment company. The concern initially produced animated films becoming an industry leader. The corporation includes entities such as Walt Disney Studios, General Entertainment Networks (Walt Disney Television), Media and Entertainment Distribution, Sports Networks (ESPN Inc.), International Operations and Disney Parks, Experiences and Products. Disney has more than 200 retail shops in the US, as well as shops in Europe, Japan and China. The company also has an online shop, shopDisney. It offers a number of product categories, including household items, toys, collectibles and clothing.

The online shop shopDisney has so far used product metadata (including names and descriptions) to display product recommendations to shop users that are related to the items they are currently browsing. This method is commonly used in e-commerce, mainly to increase the likelihood of a consumer buying another product. Due to the rather limited possibilities associated with the use of metadata, this solution often contributes to many misguided purchase suggestions. For example, a customer looking for a sleep mask would come across recommendations for costume masks, which are a separate product category. In order to improve the way products are recommended to customers, the Walt Disney Company decided to implement an artificial intelligence tool. To this end, a collaboration was undertaken with Google, which has solutions based on AI methods. Such a tool is Recommendations AI, which uses machine learning to analyse data and optimise processes. The adapted artificial intelligence system began collecting data and analysing it, which translated directly into the generation of relevant product suggestions in the online shop. As a result of the implementation, shopDisney has recorded increased customer engagement in the sales process, leading to higher sales figures and, in turn, increased revenue for the company. Thanks to the AI system's analysis of consumers' previous interactions in the online shop, the management decided to extend the recommendation functionality also at the stage when customers add items to the shopping cart. The AI system detected that often products displayed by customers are grouped together and purchased by them. Using this relationship, Recommendations AI intelligently displays product suggestions based on consumers' previous purchasing decisions. In both cases, the machine learning tool showed greater efficiency than standard metadata-based mechanisms (Vignesh, 2019).

6. Summary

The research conducted suggests that the application of artificial intelligence in marketing communications generates multifaceted benefits for both the company and the consumer (Figure 2). Its use mainly revolves around the automation, control and optimisation of processes provided by AI. On the brand side, its effect is primarily to better identify the needs of the buyer and to be able to tailor the communication provided to them more effectively. This creates a greater sense of connection with the brand for the consumer, fostering his trust and engagement.

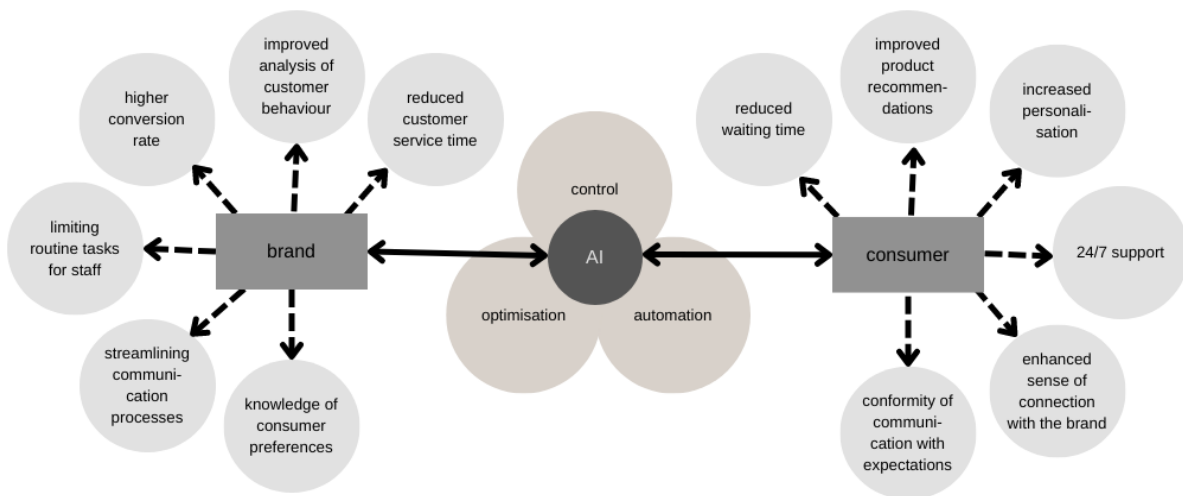


Figure 2. Areas for optimising marketing communications via AI systems. Source: own study.

Undoubtedly, the use of artificial intelligence is significantly changing business operations. However, in order for its implementations to be successful, it is essential to know the detailed specifics of this type of IT solution and to understand the needs of the brand and its audience. It should therefore be preceded by practices such as:

- recognising the benefits of AI,
- conducting an analysis of the company's needs and expectations regarding the implementation of the technology,
- examining the requirements of consumers, the implementation of which can be facilitated by the automation of marketing communications using artificial intelligence,
- becoming familiar with solutions from this area applied in other market institutions,
- setting specific business objectives resulting from the implementation of AI,
- carefully selecting a project contractor who specialises in systems from the area of artificial intelligence,
- ensuring that the solution is intuitive to use (e.g., by limiting useless functionalities),
- providing access to good quality databases,
- securing the system against hacking attacks,
- testing the solution before releasing it in order to eliminate possible errors.

In turn, after implementation, the operation of the system should be regularly tested, both for correctness and its further development as a result of machine learning. At the same time, it is worth following the trends emerging in technology and, if necessary, considering the development of applied AI solutions. Progressive digitalisation, in a way, imposes an obligation on companies to observe trends and respond to them if they want to remain leaders in the area of modern marketing communication that meets the needs of the contemporary consumer.

Acknowledgements

The publication was financed from the subsidy granted to the Cracow University of Economics.

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