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Enhancing Customer Engagement in Social Media with AI – a Higher Education case study

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Abstract

Purpose. The study aims to demonstrate the importance of artificial intelligence (AI) and examples of tools based on it in the process of enhancing (building, measuring, and managing) customer engagement (CE) in social media in the higher education industry. CE is one of the current essential non-financial indicators of company performance in Digital Marketing strategy. The article presents a decision support system (DSS) based on social media engagement management with the use of AI-based tools in a higher education industry case study.

Methodology. The study was based on an analysis of the literature on AI in conjunction with CE, the results of research – 2022 Social Media Industry Benchmark – prepared by Rival IQ, and qualitative research (in-depth interviews with experts) at selected universities in Poland. At a later stage, the interviews were transcribed, thematically analyzed, and open coding with NVivo was performed.

Findings. The conducted study was of an introductory and exploratory nature. It recognises the significant role of AI in enhancing CE in social media. At the same time, examples of AI-based tools that can be used for this have been indicated. It was unequivocally stated that by implementing AI in marketing, universities can act more effectively and consequently enhance their non-financial performance. For them, it is a system that assists decision-making in the field of social media engagement management.

Research limitations. Due to its preliminary nature, the study used secondary sources (Rival IQ Report 2022) and individual in-depth interviews with three managers of promotion/marketing departments, which does not give a complete picture of the situation under analysis. However, it is the first step in research on this subject that is to be continued.

The theoretical contribution. The conducted research demonstrated the role of AI in enhancing customer engagement in social media in higher education while at the same time showing its auxiliary role in the decision-making process.

Practical implications. Specific tools such as Sprout Social or Rival IQ were identified that, when applied in universities, can measure the engagement rate and effective CE management in social media used by the university.

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1. Introduction

"*The future of the industry is marketer + machine. Artificial intelligence has the potential to dramatically enhance your knowledge and capabilities, and give you competitive advantage. Let's get started.*"

Cathy McPhillips
(Marketing Artificial Intelligence Institute)

In the present post-Covid world, marketing in any company or organization can no longer exist without new technological solutions. In the latest report by the Marketing Science Institute (MSI), "The Customer-Technology Interface" was recognized among the strategic goals as the most urgent research area [1]. It shows the importance of technology as a strategic tool not only for marketers but also for managers in decision-making processes.

One of MSI's five broader research questions for 2020-2022 is: "What new technologies (e.g., automation/robotics, AI, IoT, 5G, voice activation, virtual/augmented reality, etc.) are creating challenges and opportunities for marketing?". This article attempts to answer this question. At the same time, in the area of marketing activities, an increase in the importance of customer engagement (CE) was observed as one of the key areas in building and managing customer relationships. Therefore, the aim of the study is to examine the importance of artificial intelligence (AI) in enhancing customer engagement (CE). This is in line with the first tier defined by MSI for the second research priority – "The Evolving Landscape of MarTech and Advertising: How can artificial intelligence (AI) be used for better advertising (and customer) engagement?".

The dynamic process of digital transformation which we observe in all industries also occurs in higher education. Marketing departments are one of the areas of these changes, especially in the era of widespread use of social media in university communication activities. For this reason, the considerations were illustrated with the example of the higher education industry.

Taking the above into account, the following aim of the study was formulated: demonstrating the importance of artificial intelligence (AI) and examples of tools based on it in the process of enhancing (building, measuring and managing) customer engagement (CE) in social media in the higher education industry.

The objective of the paper is related to a significant research gap. There is no evidence in the literature about the importance of AI and AI tools in the process of enhancing (building, measuring and managing) customer engagement (CE) in social media in the higher education industry, especially public universities in Poland. This explains the direction taken in this paper.

The importance of AI in marketing is confirmed by the estimate that "by 2023, 30% of customer service organizations will deliver proactive customer services by using AI-enabled process orchestration and continuous intelligence" [2]. The role of artificial intelligence in marketing cannot be overestimated. AI applied in marketing helps to increase revenues while reducing operating costs. "Social media marketing is one of the main areas where marketers can both skyrocket performance and efficiencies by using artificial intelligence, getting more value and engagement out of every online conversation that happens on social media channels" [3]. Therefore, the main research problem was formulated as follows: what role do artificial intelligence (AI) and AI exemplary tools play in the process of enhancing (building, measuring, and managing) customer engagement (CE) in social media in the higher education sector?
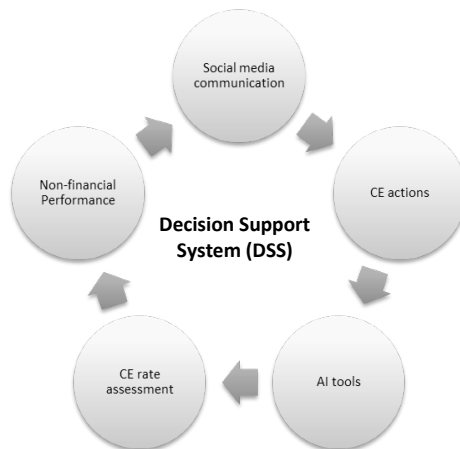
Fig. 1. AI in CE in social media management framework –
Decision Support System (DSS)

The assumptions behind the study are presented in Figure 1. Marketing activities undertaken in social media are aimed at engaging, which, with the use of tools based on artificial intelligence, can be measured and assessed in terms of non-financial performance. As a result, it allows for the continuous improvement of action taken via tools based on AI, and also supports the decision-making process in managing social media engagement.

The paper consists of four parts. The first part presents a theoretical framework of the role of AI in marketing and CE. This issue is discussed from the perspective of the fundamental concepts of artificial intelligence in terms of the customer engagement. The second part of the work presents the methodology of the research, while the third part examines and discusses the research results. The final section offers conclusions from the study along with their limitations and directions of future research.

2. Literature review – the role of AI in marketing and CE

2.1. AI in CE

Artificial intelligence (AI) is the subject of theoretical and applied research in many areas. For a relatively short time, it has also undergone research in the area of marketing [4, 5], which is closely related to popular digital marketing. Since 2020, significantly growing interest has been observed in AI in marketing [6, 7, 8]. "Artificial intelligence marketing (AI Marketing) is a method of leveraging customer data and AI concepts like machine learning to anticipate your customer's next move and improve the customer journey. Advancements in Artificial Intelligence offer companies better ways to do that" [9].

The issue of customer engagement (CE) has been popular since 2001 – i.e., for more than twenty years [10, 11]. Ever since this concept appeared in marketing, it has been the subject of conceptualization and empirical research in isolation from AI. The gap in this respect and the importance of the issue of AI in connection with CE were indicated by Hollebeek, Sprott and Brady [12].

AI helps marketing managers manage CE through a multitude of interactions with the company and brand etc. Marketing activities are supported by various systems and related marketing tools. Among them, the following types may be distinguished [12]:

- Robotic process automation (RPA),
- Machine learning (ML),
- Deep learning (DL).

The first type of AI – robotic process automation (RPA) – is based on the automation of processes by using linear algorithms to answer basic questions [12]. The AI used in RPA supports the data request process, but there is no learning or adaptation within the process [13].

Machine learning (ML) requires large datasets from which single-task ML algorithms learn through trial and error. This learning occurs without human intervention. As a result of the continuous "learning" process, ML algorithms offer users more and more accurate suggestions [13].

The last type of artificial intelligence is deep learning (DL). It is a reflection of the biological nervous system. It is based on artificial neural networks. Between "input" and "output" DL uses a cascade of multiple layers through which data is transformed, making it similar to the way humans think. The output from a given layer is used as input for the next layer, so it can be seamlessly integrated into the decision-making process [13].

Each of the types of artificial intelligence discussed above can be used to influence CE. It is estimated that the use of AI will enhance customer engagement [12, 8, 14]. In addition, tools based on various types of artificial intelligence support the CE management process [15].

Furthermore, the use of AI in marketing allows optimizing processes, including those related to customer engagement, on a massive scale. Progressive digitization also enables mass personalization. Thanks to the use of AI and algorithmization, it is possible to monitor performance in real time and thus maximize the effects of actions taken.

2.2. CE rate as non-financial performance metrics

In the midst of many ongoing discussions about the relevant metrics in current marketing, customer engagement rate is treated as one of the most important in terms of digital marketing [16]. It is closely related to the modern technologies that are applied in marketing. The level of engagement is treated as one of the current non-financial indicators of company performance in digital marketing strategies. It shows the importance of tools measuring the level of CE as a support of the decision-making process in companies and organizations (e.g. services, companies, universities).

Customer engagement rate depends on the context (e.g. online advertising, e-commerce) and on CE touchpoints (e.g. social media, e-mail, video chat). Therefore, how the CE rate is defined depends on the adopted point of view and the related measurement method. In this study, the CE rate is tested for customer engagement on social media. Accordingly, the CE level is understood as a metric which means active engagement of the audience with the content indicating engaged customer interaction with a brand through "likes," comments and social sharing [16]. As Jaakonmäki, Müller, & vom Brocke Jaakonmaki [17] claim, "how the engagement rate is calculated varies across social media platforms, but it generally measures the percentage of people who react to a post in some way, such as by "liking" it or commenting on it" [17].

Based on the definition proposed by Rival IQ which conducts research on customer engagement in social media [18], CE level is assumed to be "measurable interaction on organic and boosted social media posts, including likes, comments, favorites, retweets, shares, and reactions. Engagement rate is calculated based on all these interactions divided by total follower count" (see 1) [19].

$$Measurable\ interaction \div Total\ follower\ count = Engagement\ rate \tag{1}$$

Factors taken into account in assessing the level of customer engagement also depend on the social media platform as follows [16]:

- Facebook: reactions, clicks, comments and shares,
- LinkedIn: interactions, clicks, followers acquired and impressions,
- Instagram: likes and comments,
- Twitter: retweets, comments and likes,
- Pinterest: likes, comments and pins.

Most multi-channel or omnichannel campaigns involve measuring engagement metrics across various channels. Monitoring the engagement rate helps to determine if digital marketing strategies are working [16].

The customer engagement rate is significant in that it affects the company's performance by boosting visibility, brand affinity, referrals and word of mouth (WoM) marketing, credibility, and by improving relationships with customers [16]. "Engagement tells your marketing team if they're reaching advocates, influencers and your target audience. Through engaging campaigns, you create advocates that are more likely to spread positive messages about your brand and convert into paying customers" [16].

The value of the engagement index shows the effectiveness of a conducted marketing campaign. It can be used by marketers for other purposes, such as [16]:

- Managing content creation strategies,
- Measuring performance in social media,
- Finding brand spokespersons/ambassadors,
- Measuring the effectiveness of specific campaigns,
- Profiling the message to a specific group of engaged recipients.

AI is therefore used to measure and manage the CE index (treated as one of the most important measures of content performance). Therefore, engagement is one of the key indicators of modern organizations.

An increase in CE rate is treated as one of the important marketing indicators taken into account in the decision-making process in the context of CE management in social media. Sprout Social, one of the best CE level monitoring and management tools, is presented as an example of an AI-based decision support system (DSS).

2.3. Engaging digital platforms – AI tools

Engaging digital platforms deliver differentiated AI-based digital engagement and immersive communication services. Moreover, by using such a platform based on artificial intelligence, interactions are multiplied and, as a result, the level of customer engagement also grows. "AI is a fundamental part of how today's social networks function"[3]. That is why AI-based tools are so widely applied in marketing. Digital marketing uses the following ten applications of artificial intelligence [20]:

- Online advertising (e.g. Google Marketing Platform),
- Personalized user experience (e.g. Hyperise, Google Optimise, VWO),
- AI-powered chatbots (e.g. Lobster, Botsify, Boost.ai) [see 21, 22, 23],
- Predictive analysis (e.g. H2O Driverless AI, IBM Watson Studio, Microsoft Azure Machine Learning),
- Web design (e.g. Wit.ai and Dialogflow, the Grid, Wix ADI, Firedrop),
- Content generation (e.g. Kafkai, Copysmith, Writesonic),
- Content curation (e.g. Pocket, Freedly, Triberr),
- E-mail marketing campaigns (e.g. rasa.io),
- Voice search optimization (e.g. Bloomberry, Clickagy, QuanticMind, Ghostery),
- E-commerce (e.g. TUP e-Commerce, Seventh Sense, Granify).

Taking into account the social media included in this study, it is important to remember that "across all social media platforms and each social media post, an AI algorithm or machine learning system is regulating how the content you create and the ads you buy are placed in front of users" [3].

In social media, AI works as follows:

- Facebook uses advanced machine learning to display content, recognize the user's face in photos, personalize ads, etc.,
- Instagram (Facebook's tool) applies AI to identify visual elements,
- LinkedIn employs artificial intelligence to match job offers and people with whom users may want to establish contact,

- Snapchat uses computer vision and AI technologies to track features and apply filters to react to the movement of the user's face in real time.

Artificial intelligence helps social media marketers create content [24]. Examples of AI technologies used included, for example, Intelligent IVR (Interactive Voice Response), conversational video bots, and in-call assistants [21]. An example of an AI-based platform supporting the process of managing customer engagement in social media is Sprout Social, and is one of the best-known CE management tools. Sprout Social applies automated technology that can help to execute community management and generate posts "that can be used to reply to fans, customers, or followers" [24]. "From the Sprout Social dashboard, you can see and respond to tweets directed at your company. Some Sprout admins also have the power to manage direct messages through the platform. In both the dashboard and direct message view, Sprout will be able to analyze the wording and sentiment of a tweet or message and suggest an auto-response that you can use or tweak. Although AI is not having a full conversation with all of your followers, this automation still may quicken up the process related to sending quick messages or tweets to respond to people." As can be seen, Sprout Social is an AI-based tool that helps boost the effectiveness of action taken while implementing social media strategies, including engagement management.

3. Research methodology

The study aims to demonstrate the importance of artificial intelligence (AI) and examples of tools based thereof in the process of enhancing (building, measuring and managing) customer engagement (CE) in social media in the higher education sector.

The study is guided by one primary research question: what role do artificial intelligence (AI) and AI exemplary tools play in the process of enhancing (building, measuring, and managing) customer engagement (CE) in social media in the higher education sector?

The research was carried out taking into account the following stages:

- An overview of the literature on the use of AI in CE.
- An analysis of secondary sources – evaluation of available reports on CE metrics in higher education.
- Primary research – individual in-depth interviews.

In the first step towards achieving the goal of the study, the literature on artificial intelligence was analyzed in the context of customer engagement. For this purpose, publications on this subject available in the WoS and Scopus databases were searched. A gap was shown to exist in AI studies when viewed in the context of customer engagement.

In order to demonstrate the importance of CE rate in enhancing customer engagement in universities, the results of a study conducted at universities in the United States by Rival IQ [19] were deemed to be best suited to the stated purpose of the study.

In the next stage, the adopted assumptions regarding the importance of the measure of customer engagement in selected universities in Poland were verified. For this purpose, 3 individual in-depth interviews were conducted with the heads of marketing or promotion departments of Polish public universities. The interview results and their comparison with the results of the report "2022 Social Media Industry Benchmark Report" prepared by Rival IQ [19] are presented in the next section of the article.

The Rival IQ report presents the results of a social media survey in 14 industries in the United States conducted on a representative sample of national and international companies from each industry, randomly selecting 150 companies from each branch from the Rival IQ database of more than 200,000 companies. The selected companies were active on Facebook, Instagram and Twitter from January 2021, with Facebook fans ranging from 25,000 to 1,000,000 with a minimum number of Instagram and Twitter followers of 5,000 at the date of the draw. The report presents the median of the results achieved by companies in each industry [19].

Primary research – in-depth interviews were conducted from April 4–14, 2022 with three managers of marketing or promotion departments of public universities in Poland. The interviews were later transcribed, thematically

analyzed, and open coding with NVivo, version 12 was performed. A summary of the data on the analyzed institutions is presented in Table 1.

Table 1. Structure of the expert group for the qualitative (in-depth interviews) study and number of students and followers on social media.

Position	Number of students (the academic year 2020/2021)*	Number of followers on Facebook (April 2nd)	Number of followers on Instagram (April 2nd)	Number of followers on Twitter (April 2nd)	Number of followers on LinkedIn (April 2nd)
University no. 1 Promotion Department Manager and Social Media Specialist	11,433	33,031	8,982	-	57,427
University no. 2 Marketing Department Manager	7,619	34,112	6,948	1,690	43,674
University no. 3 Promotion and Information Department Manager	9,297	25,481	1,376	-	23,105

Source: Websites of the analyzed universities.

* Data as of December 30, 2020 – GUS (Statistics Poland) S-10 report.

All experts are employed in managerial positions in the above-mentioned departments (see Table 1). The largest number of students attend University no. 1. This translates into the number of followers on each social media platform. University no. 2 has the lowest number of students. However, this institution is highly active on social media (the number of followers) and is the only university among the surveyed higher education institutions with a Twitter account. The third university has the lowest number of followers on social media.

4. Research results and discussion

The description of the situation in the higher education industry was based on data from a report prepared by Rival IQ – "2022 Social Media Industry Report" [19]. The presented report indicates the importance of customer engagement rate, based on posting frequency, media type, hashtags, etc., thus indicating the actual social performance. The results of research conducted at universities in the United States by Rival IQ were used to demonstrate the importance of CE rate in enhancing (building, measuring, and managing) customer engagement in the higher education. In the next stage, the adopted assumptions regarding the importance of the measure of customer engagement in selected universities in Poland were verified.
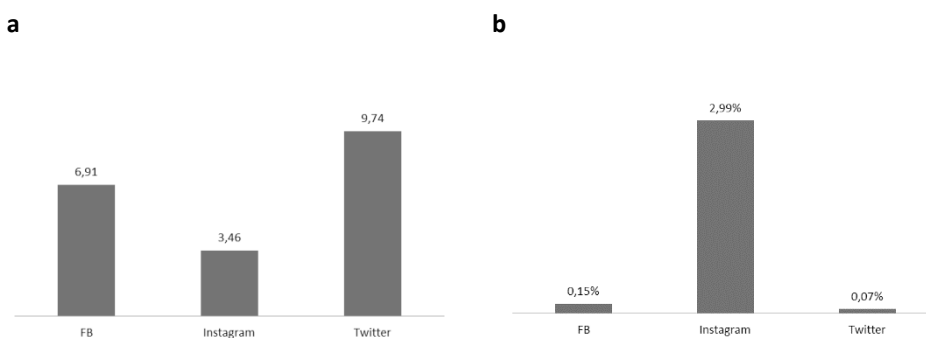

Fig. 2. (a) Number of posts per week; (b) Engagement rate/post/tweet (by follower) in higher education
Source: [own elaboration based on 19].

As can be seen (Fig. 2), among the surveyed US universities, engagement level (the number of posts divided by the number of followers) is the highest in the case of Instagram, at almost 3%. The lowest CE level is observed for Twitter, at below 0.1%. This shows the significance of individual communication channels and their role in building customer engagement. Managers of social media communication should pay attention to managing their engagement in the media platform with the highest engagement level while also keeping other social media in mind.

Table 2. University engagement indicators.

Indicators	Value
Posts per university per week	25.8
Engagement per post	362.8
Engagement rate per post	0.33 %

Source: [25].

The average increase in the number of followers for US universities was 0.4% in the preceding 30 days. The average engagement for each post was 368.8, while the average level of engagement per post was 0.33% (see Table 2). The highest score was achieved by the University of Iowa – 971.1 engagements per 161 posts in the preceding 30 days [25].

In the USA, Rival IQ uses AI-based technology to measure customer engagement rate on a continuous basis. This allows universities to monitor the current engagement rate and social performance on an ongoing basis and to properly manage customer engagement through posts on social media. Undoubtedly, tools based on artificial intelligence provide support in this regard. One such tool is the aforementioned Sprout Social.

The importance of measuring and managing customer engagement in the higher education sector in Poland is demonstrated based on the primary study – individual in-depth interviews conducted with managers of marketing/promotion departments at public universities.

As shown by the results of the conducted in-depth interviews, **marketing/promotion departments** regularly analyze **the following key performance indicators:** activity (reactions, comments, sharing), reach, page views, the interactivity index, the number and percentage of engaged users, PTAT (people talking about this), as well as the number of views, fans, followers, posts published, etc. To analyze the above-mentioned indicators, they use free tools, such as Facebook statistics and Google Analytics.

Engagement is an **indicator** that all marketing managers take note of. They perceive it as one of the main measures of the effectiveness of their marketing activities on social media. Facebook statistics, for example, or Google Analytics (in their basic, free of charge form) are used for this purpose. In addition to **free tools, paid tools** are also used to this end to perform so-called social media monitoring. These include, for example, Sotrender or BRAND24. The latter had been used for a while but had to be discontinued due to costs.

When the question **"how is engagement in social media built?"** was asked, the following answers were offered: "*creating engaging posts on Facebook and Instagram, engaging stories on FB and IG (polls, quizzes, questions)*" or "*engaging content, 'call to action', videos, asking questions, encouraging discussion, stories in the form of surveys, reposts, efficient response to inquiries*", "*we try to diversify these tools*". The actions taken are similar because the same social media are used. Only one university uses Twitter. However, another university in the study plans to start using this social medium. In one of the surveyed universities, mention was even made of the possibility of using TikTok as the so-called "new realm of social media". All respondents unanimously confirm the importance of content as the main factor that builds engagement. One manager said: "*we're trying to find interesting content*," another of the interviewees confirmed the role of content saying: "*the most important thing is the content*" which is differentiated depending on the platform used.

One manager stated that the approach of "*targeting, tracking and analyzing the so-called Metadata behind social media content*" is used to build engagement. This points to a process-based approach to managing social media

engagement. At the same time, the interviewees pointed out that they do not use special tools dedicated to engagement management.

The last of the discussed issues was **"the perception of the role of AI in managing customer engagement in social media"**. Heads of marketing/promotion departments in the surveyed Polish public universities are aware of the use of AI in social media. However, one might form the impression that the potential of the opportunities offered by AI tools to manage customer engagement in social media and broadly understood higher education marketing is yet to be fully realized and appreciated. This is evidenced by such statements as: "*I don't think we are fully aware of it*" or also "*We once tested a bot on Messenger but gave up this concept*". At the same time, artificial intelligence is perceived as a direction that is worth more attention, as reflected by the statement: "*we are not getting that deep into AI yet, but it is indeed a direction that is worth considering*".

In answer to the research problem, on the basis of the research presented in this article, it can be concluded that artificial intelligence and exemplary tools based on it (e.g. Sprout Social or Rival IQ) constitute an important element of strengthening the customers engagement in social media in the education sector. They allow not only to build engagement by generating posts, but also to measure the engagement rate, which gives the basis for its management, thanks to the possibility of its continuous monitoring and taking appropriate actions to optimize the process of enhancing the engagement of social media participants in the higher education sector.

5. Conclusions and research limitations

Artificial intelligence supports greater customer engagement on social media and at the same time with AI applications it "can help managers increase revenue and reduce costs at their companies"[24]. "Social media success is about so much more than getting the most comments or likes: it's about increasing engagement while also growing or maintaining the percentage of your audience that engages as you expand your audience"[19].

As shown by the analysis of secondary data from the Rival IQ report [19] on the customer engagement index and the results of the primary study – individual in-depth interviews with managers of marketing or promotion departments of universities in Poland – Polish universities are only just slowly starting to introduce tools based on artificial intelligence into their marketing activities on a large scale. AI-based solutions are the most widespread and the best tools available to analyze action undertaken in social media. For example, a tool such as Google Analytics can monitor various factors. However, monitoring indicators in terms of social media is the exception rather than the rule and an action taken sporadically, if necessary. Thus, the above-mentioned tools based on artificial intelligence are not commonly used by marketing/promotion departments of public universities. This is, on the one hand, due to the relatively early stage of the digitization process of Polish universities as compared to American ones, and hence the low level of the so-called digital maturity of Polish universities [26]. On the other hand, the budgets of Polish public universities are much lower than those of their American counterparts, which is closely related to the differences between these two countries in financing and managing higher education institutions. The financial aspect is not so significant in the case of the aforementioned AI-based tools that assist in systematic CE level measurement and effective management of customer engagement, considering that, for example, a monthly/annual subscription is USD 199/439 for Sprout Social [27]. The poor usage of this type of tool – as one of the interview participants mentioned – tends to stem from low awareness (or knowledge) about this issue.

In conclusion, tools based on artificial intelligence undoubtedly provide effective assistance for building, measuring and managing customer engagement in universities, thus helping the decision-making process and becoming a permanent element of the decision support system (DSS) (see Fig. 1). However, they are not yet used to a significant extent by Polish public universities as compared to universities in the United States. It can be assumed that over time, they will become as common as the social media currently used. Therefore, this indicates the need for further research in this area and that Polish universities should monitor the ongoing process of achieving digital maturity and following in the footsteps of American universities as far as new trends are concerned.

The study findings have several limitations. Qualitative research (individual in-depth interviews) among experts representing public higher education in Poland was conducted as the initial stage of the research process aimed at demonstrating the use of AI-based tools and their role in the process of enhancing (building, measuring and managing) user engagement in the media social networks in universities. It was of an introductory and exploratory nature of the phenomenon under study. No statistical analysis was carried out here, only a qualitative analysis. In the

next stage - not included in this study - quantitative research will be carried out, and then the statistical relationships between the variables of the conceptual measurement model (CFA) and the structural model (SEM) will be demonstrated.

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