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PROACTIVE DIGITAL MARKETING OF EDUCATIONAL SERVICES

The relevance of this study is driven by the transformation of digital marketing in higher education under the influence of advances in artificial intelligence, data analytics, digital platforms, and increasing competition among universities to attract and retain students. The study is based on the hypothesis that the effectiveness of proactive digital marketing is ensured by the synergy of forecasting, personalization, monitoring, automation, and managerial decision-support mechanisms, whose interconnected functioning is enabled by the integrative role of artificial

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ПРОАКТИВНИЙ ЦИФРОВИЙ МАРКЕТИНГ ОСВІТНІХ ПОСЛУГ

Актуальність дослідження зумовлена трансформацією цифрового маркетингу у сфері вищої освіти під впливом розвитку штучного інтелекту, аналітики даних, цифрових платформ і посилення конкуренції між університетами за залучення та утримання здобувачів освіти. Дослідження ґрунтується на гіпотезі, що результативність проактивного цифрового маркетингу забезпечується синергією механізмів прогнозування, персоналізації, моніторингу, автоматизації та підтримки прийняття управлінських рішень, взаємопов'язане функціонування яких забезпечується інтеграційною



intelligence. The methodological framework is based on systemic, structural-logical, comparative, and conceptual approaches. The study employs methods of scientific generalization and systematization, comparative analysis, content analysis of the practices adopted by leading universities worldwide, conceptual modelling, and graphical visualization. The findings conceptualize proactive digital marketing of educational services as an integrated stakeholder engagement management system based on the proactive identification of stakeholder needs, behavioral prediction, personalized digital engagement, monitoring of students' learning pathways, communication automation, and information-analytical support for managerial decision-making. The study demonstrates that the effectiveness of proactive digital marketing depends not on the number of implemented digital technologies but on the degree of integration, coherence, and synergy among its managerial mechanisms. A managerial mechanism synergy function and an artificial intelligence integration function are proposed, whose interaction explains the transition from a reactive to a proactive digital marketing model. Artificial intelligence is identified as a systemic integrator of forecasting, personalization, monitoring, automation, and managerial decision-support mechanisms within a unified management cycle. The practical significance of the research lies in the applicability of the proposed conceptual framework to the development of universities' digital marketing strategies, the assessment of digital maturity and organizational readiness for artificial intelligence implementation, and the further development of an integrated index for assessing proactive digital marketing in higher education institutions.

Keywords: educational services; higher education institution; digital transformation; digitalization; proactive digital marketing; artificial intelligence; AI-driven marketing; stakeholder engagement management; personalization; information and communication system; strategic management; automation; synergy; integration; innovation; competitiveness.

JEL Classification: I21, M31, O33.

Introduction

The digital transformation of the economy and the rapid development of information and communication technologies, artificial intelligence (AI), digital platforms, business models, and services have brought about a transition to a new stage of socio-economic development, in which digital

роллю штучного інтелекту. Методологічну основу дослідження становлять системний, структурно-логічний, компаративний і концептуальний підходи; застосовано методи наукового узагальнення та систематизації, порівняльного аналізу, контент-аналізу практик провідних університетів світу, концептуального моделювання і графічної візуалізації. За результатами дослідження проактивний цифровий маркетинг освітніх послуг концептуалізовано як систему стратегічного управління взаємодією зі стейкхолдерами, що ґрунтується на випереджальному виявленні їхніх потреб, прогнозуванні поведінки, персоналізації цифрової взаємодії, моніторингу освітніх траєкторій, автоматизації комунікацій та інформаційно-аналітичній підтримці прийняття управлінських рішень. Обґрунтовано, що його результативність визначається не кількістю впроваджених цифрових технологій, а рівнем інтегрованості, взаємоузгодженості та взаємопідсилення управлінських механізмів. Запропоновано функцію синергії управлінських механізмів і функцію інтеграції штучного інтелекту, взаємозв'язок яких пояснює перехід від реактивної до проактивної моделі цифрового маркетингу. Штучний інтелект визначено як системний інтегратор механізмів прогнозування, персоналізації, моніторингу, автоматизації та підтримки прийняття управлінських рішень у межах єдиного управлінського циклу. Практичне значення отриманих результатів полягає у можливості їх використання для формування цифрових маркетингових стратегій університетів, оцінювання цифрової зрілості та організаційно-управлінської готовності до імплементації штучного інтелекту, для подальшого розроблення інтегрального індексу проактивного цифрового маркетингу закладів вищої освіти.

Ключові слова: освітні послуги, заклад вищої освіти, цифрова трансформація, цифровізація, проактивний цифровий маркетинг, штучний інтелект, маркетинг на основі штучного інтелекту, управління взаємодією зі стейкхолдерами, персоналізація, інформаційно-комунікаційна система, стратегічне управління, автоматизація, синергія, інтеграція, інновації, конкурентоспроможність.

technologies have acquired the status of a key driver of economic growth, innovation, and increased competitiveness of business entities. Under these conditions, digitalization extends beyond the technological modernization of individual business processes and evolves into a comprehensive strategic management model that integrates digital solutions into all functional areas of an organization's activities, ensuring the development of new mechanisms for value creation, stakeholder engagement, and sustainable development.

One of the areas undergoing the most extensive and systemic changes under the influence of digital transformation is education. In accordance with the provisions of the Digital Education Action Plan 2021–2027, the European Commission defines digital education as the use of digital technologies, tools, and content to support learning, teaching, assessment, and the management of educational activities, while identifying the development of a highly effective digital education ecosystem as one of the strategic priorities for the development of the European Union (European Commission, n. d.). In this context, the digital transformation of education is not limited to the technological modernization of the educational process but involves the comprehensive development of digital infrastructure, enhancement of the digital competencies of participants in the educational process, introduction of innovative models of communication and interaction among stakeholders, and creation of an integrated digital environment capable of ensuring accessibility, personalization, adaptability, and continuity of education while laying the groundwork for its innovative development.

At the same time, the education services market is undergoing significant transformations. Intensifying global competition among universities, the internationalization of higher education, demographic changes, the expansion of academic mobility, and the development of digital platforms and AI technologies are substantially changing the conditions, principles, and mechanisms governing the operation of higher education institutions. Whereas their competitive advantages were traditionally determined primarily by the quality of educational programs, academic reputation, and human resources, under current conditions, the quality of digital interaction with stakeholders, personalization of communication, digital reputation, the accessibility and convenience of digital services, and the effectiveness of data collection, integration, and analytical use are becoming increasingly important. These processes are also transforming the behaviour of prospective higher education students. Decisions regarding university selection are increasingly shaped by the digital experience of interacting with an educational institution and by information obtained through official websites, social media, international and national rankings, online reviews, recommendation services, and other digital communication channels.

According to an international study by Spark451 & Jenzabar, which involved more than 1 800 high school students and 1 400 parents, 93% of prospective applicants use social media as one of their primary sources of information about universities, while 30% use generative artificial

intelligence (GenAI), primarily ChatGPT, when selecting a higher education institution (Spark451 & Jenzabar Company, 2025, October 1). These findings reflect fundamental changes in the information behaviour of prospective students. According to the Pew Research Center, in 2024, 90% of Generation Z members used YouTube, 63% used TikTok, and nearly half were online almost constantly, indicating the dominance of digital communication channels in the processes of information search, evaluation, and decision-making (Pew Research Center, 2024, December 12).

These trends are also confirmed by materials from Quacquarelli Symonds (QS), according to which a university's official website, social media, digital reputation, online reviews, personalized communications, and digital services are among the key factors influencing prospective applicants' choice of a higher education institution (QS, 2025, June 12). Thus, the quality of digital interaction with target audiences is becoming not merely a communication tool but also one of the decisive factors in ensuring universities' competitiveness in the education services market.

As a result of these transformations, the role of marketing in the activities of higher education institutions (HEIs) is being redefined. The traditional model, primarily focused on promoting educational programs and attracting applicants, is evolving into an integrated stakeholder engagement management system based on digital communications, data analytics, interaction personalization, digital reputation management, and the creation of long-term value in educational services.

An analysis of contemporary international research reveals a gradual shift from the study of individual digital marketing (DM) tools toward its conceptualization as a component of the strategic management of higher education institutions. The works of Dwivedi et al. (2021), Verhoef et al. (2021), Kraus et al. (2021), Krishen et al. (2021), and Shankar et al. (2022) explore the theoretical and methodological foundations of the digital transformation of marketing activities, the use of digital platforms, data analytics, and personalized communications. Research by Holmes et al. (2022) and Zawacki-Richter et al. (2024), along with analytical materials published by UNESCO (2023) and the OECD (2026, January 19), focuses on the potential of AI, Learning Analytics, and data management technologies to support managerial decision-making, personalize the educational experience, and enhance university competitiveness.

A separate strand of academic discourse focuses on digital marketing in educational services. The works of Nofrizal et al. (2024), Collins et al. (2024), Pawar (2024), and Alshurideh et al. (2025) address issues related to university digital branding and reputation, educational program positioning, factors influencing the choice of higher education institutions, communication personalization, and stakeholder engagement management.

An important contribution to the development of this research area has also been made by Ukrainian scholars. Lisun's monograph (2024) examines the conceptual foundations of DM in educational services, strategic

approaches to managing digital marketing communications, web analytics, digital positioning tools for educational institutions, and factors shaping an educational brand. Iankovets (2025) explores the strategic nature of digital marketing and substantiates the relationship between strategic assets, digital marketing tools, and customer experience design, demonstrating the need for their integrated use to create value. Certain aspects of the digital transformation of higher education institutions are addressed in the works of Kalinichenko (2022), which focus on the development of university digital infrastructure, digital competencies, and the integration of modern digital technologies into Ukraine's higher education system.

Thus, an analysis of international and Ukrainian scholarly sources reveals a gradual evolution in research approaches, from the study of individual digital tools and communication channels to the conceptualization of digital marketing as a component of strategic management aimed at creating value, managing stakeholder engagement, and ensuring university competitiveness. Despite significant advances in research on the digital transformation of education, digital ecosystems, EdTech, digital communications, Learning Analytics, data-driven management, and the application of artificial intelligence, the theoretical and methodological foundations of proactive digital marketing in educational services remain insufficiently developed. Most contemporary studies focus on individual digital marketing tools, the digitalization of the educational process, or the use of information and communication technologies in the activities of educational institutions. Meanwhile, the development of a proactive strategic stakeholder engagement management system in which AI serves as an integrator of management mechanisms has yet to receive comprehensive conceptual substantiation.

The analysis of scholarly sources made it possible to trace the evolution of marketing approaches in higher education and identify patterns in the transformation of perceptions regarding the role of digital marketing in the activities of higher education institutions. Based on a synthesis of theoretical principles, the main stages in the development of educational services marketing have been identified, reflecting its gradual transition from traditional marketing communications to strategic digital management of stakeholder engagement and the formation of a proactive digital model (*Figure 1*).

The results of the analysis of the evolution of educational services marketing indicate that each stage of its development was accompanied by the formation of corresponding scientific concepts, which successively expanded the subject area and managerial purpose of digital marketing (DM) in higher education. Their systematisation makes it possible to trace the development of scientific thought from the concept of educational services marketing to AI-driven Marketing and to substantiate the assumption that proactive digital marketing of educational services is emerging as the next stage in its evolution. In accordance with the logic of this evolution, it is appropriate to identify the main conceptual areas that reflect the gradual increasing complexity of the content, tools, and managerial functions of marketing in higher education.

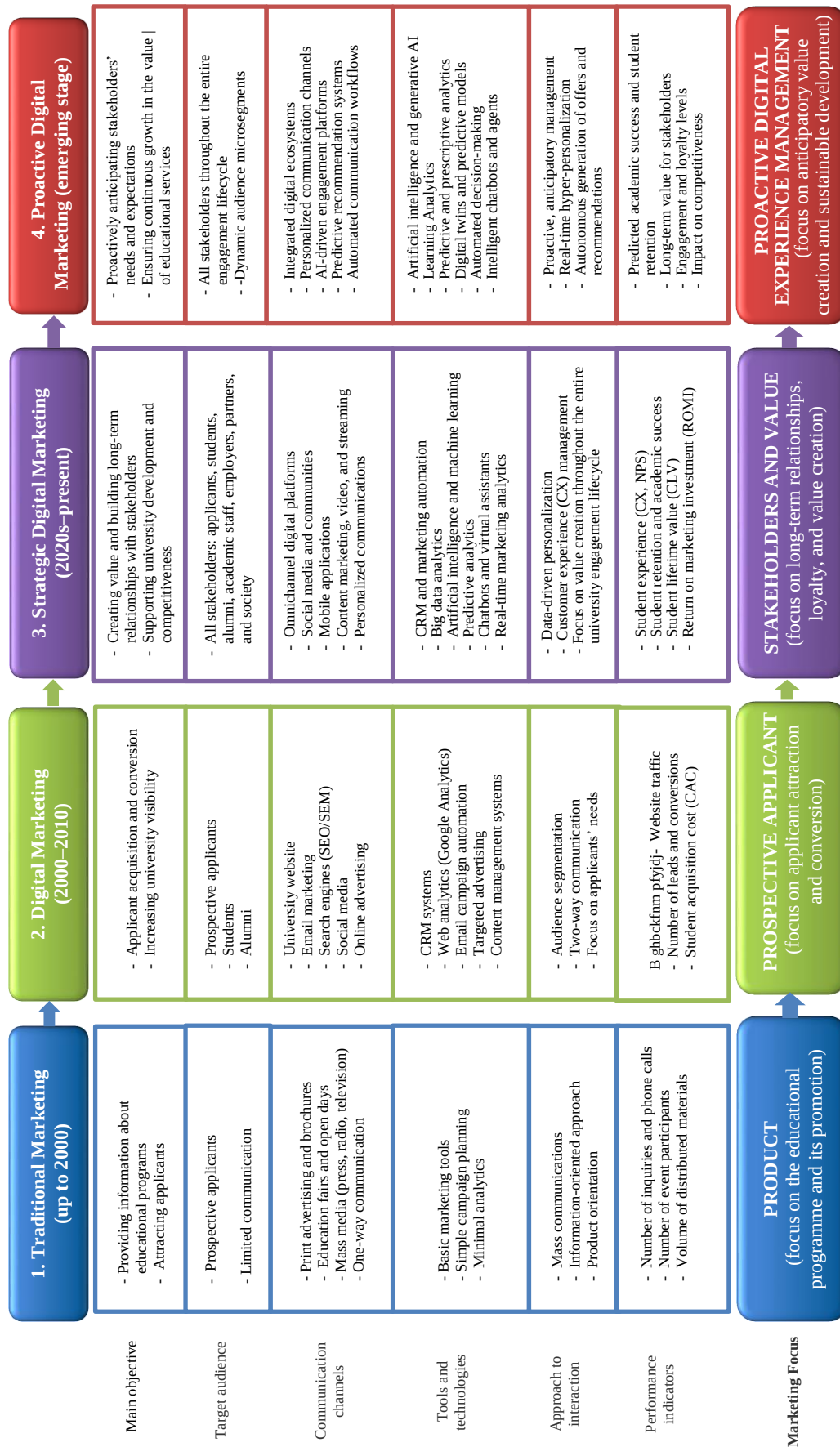


Figure 1. Evolution of educational services marketing: from the traditional to the proactive digital model

Source: compiled by the authors based on Alshurideh et al. (2025), Bohara et al. (2024), Collins et al. (2024), Dwivedi et al. (2021), Dwivedi et al. (2023), Krishen et al. (2021), Nofrizal et al. (2024), Verhoef et al. (2021), Pawar (2024), Shankar et al. (2022), Kalinichenko (2022), Lisun (2024), Iankovets (2025).

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The Concept of Educational Services Marketing

The starting conceptual area is educational services marketing, as presented in the works of Nofrizal et al. (2024), Collins et al. (2024), Pawar (2024), Lisun (2024), and other scholars. Within this area, the main focus is on university brand development, educational programme positioning, the study of factors influencing the choice of a higher education institution (HEI), digital reputation management, marketing communications, and ensuring the competitiveness of educational services.

These studies substantiate that a prospective student's decision is shaped by a set of interrelated factors, including academic reputation, the quality of educational programmes, employment prospects, the university brand, communication activity, recommendations, information accessibility, and the digital presence of the higher education institution. At the same time, scholars emphasise that, under contemporary conditions, universities compete not only in terms of educational programme quality but also in terms of the quality of digital interaction with stakeholders.

The Concept of Digital Marketing

The subsequent stage in the development of scientific thought is associated with the formation of the concept of digital marketing, which significantly broadened the traditional understanding of the scope and tools of marketing activities. In contemporary research, digital marketing is interpreted not merely as the use of digital promotion channels but as a comprehensive system of interaction with consumers that integrates digital platforms, social media, big data, marketing analytics, marketing process automation, personalised communications, and AI technologies (Dwivedi et al., 2021; Krishen et al., 2021; Verhoef et al., 2021; Shankar et al., 2022).

Unlike the traditional marketing model, digital marketing enables interactivity and two-way communication, measurable results, the prompt adjustment of marketing activities, message personalisation, customer experience management, and data-driven decision-making. The development of digital technologies has thus created the preconditions for the transition from mass marketing communications to personalised and continuous interaction with consumers.

The Concept of Digital Marketing Transformation

The widespread adoption of digital technologies and their integration into all areas of organisational activity have led to the formation of the concept of digital marketing transformation. Within this approach, digital marketing is no longer viewed as a separate functional area or a set of technological tools, but as an integral component of an organisation's systemic digital transformation.

The works of Verhoef et al. (2021), Kraus et al. (2021), Dwivedi et al. (2023), and Iankovets (2025) substantiate that digital technologies transform not only marketing tools but also business models, value creation processes, mechanisms of interaction with consumers, and approaches to strategic management. This concept centres on digital platforms, customer orientation, digital experience management, omnichannel communications, CRM systems, data integration and management, and the use of analytics to support strategic management decisions.

Thus, while the concept of digital marketing reflects the expansion of channels, technologies, and formats of interaction with consumers, the concept of digital marketing transformation involves a systemic restructuring of marketing processes, management mechanisms, and value creation models based on digital technologies.

The Concept of Digital Marketing in Higher Education Institutions

The further development of scientific thought has led to the formation of the concept of digital marketing in higher education institutions, within which the general principles of digital marketing have been adapted to the specific characteristics of university operations. Unlike commercial organisations, higher education institutions interact with various stakeholder groups: prospective applicants, students, alumni, employers, academic partners, government authorities, and members of the public. Consequently, digital marketing in higher education is increasingly regarded not merely as a system for promoting educational services but as a tool for strategically managing stakeholder relationships. This approach involves the integration of digital communications, official university websites, social media, SEO, content marketing, CRM systems, marketing automation, chatbots, digital reputation management, and analytics (Pawar, 2024; Bohara et al., 2024; Alshurideh et al., 2025; Lisun, 2024; Kalinichenko, 2022).

The Concept of Artificial Intelligence-Based Marketing

The next stage of evolution is associated with the formation of the concept of AI-based marketing, which qualitatively transforms the role of digital technologies in marketing activities. While previous concepts involved the use of digital technologies as a means of communication, automation, and support for marketing processes, AI-based marketing is grounded in the use of AI as a tool for analysis, forecasting, and support for marketing and management decisions.

The reports by UNESCO (2023) and the OECD (2026, January 19), as well as the works of Brand et al. (2026), Holmes et al. (2022), and

Zawacki-Richter et al. (2024), establish that the application of AI technologies, Learning Analytics, big data, predictive analytics, and generative artificial intelligence enables the transition from reactive to proactive management of interactions with students. These technologies make it possible to predict prospective applicants' behaviour, personalise communications, analyse users' digital footprints, evaluate the effectiveness of marketing campaigns, automate stakeholder interactions, and support data-driven management decision-making. It should be noted, however, that even within the concept of AI-based marketing, artificial intelligence is primarily regarded as a set of individual digital technologies or tools for automating marketing activities rather than as an integrated mechanism for the strategic management of stakeholder engagement (*Table 1*).

Table 1

Comparative analysis of contemporary concepts
of digital marketing of educational services

Concept	Main Content	Conceptual and Research Limitations
Educational Services Marketing	University branding, positioning, factors influencing the choice of an HEI, reputation	Insufficient consideration of the impact of digital transformation, data management, and AI technologies on the marketing activities of HEIs
Digital Marketing	Digital communication channels, CRM systems, social media, web analytics, content marketing, marketing process automation	The concept is primarily oriented towards the commercial sector; insufficient consideration of the specific features of stakeholder engagement management in higher education institutions
Digital Marketing Transformation	Data-driven management, customer experience, digital platforms, omnichannel communications, transformation of marketing processes and value creation models	The main focus is on the digitalisation of business processes; the managerial mechanisms of proactive engagement with university stakeholders remain insufficiently explored
Digital Marketing in Higher Education Institutions	University branding, digital communications, educational programme positioning, digital reputation management, and stakeholder relationship management	A comprehensive conceptual approach integrating digital communications, data analytics, CRM systems, and managerial mechanisms into a system of strategic management of higher education institutions has not yet been developed
Artificial Intelligence-Based Marketing	Artificial intelligence, <i>Learning Analytics</i> , predictive analytics, chatbots	Artificial intelligence is primarily regarded as a technological tool for automation; its role as an integrator of the managerial mechanisms of proactive digital marketing of educational services has not been sufficiently substantiated

Source: compiled by the authors.

The synthesis of the results of the comparative analysis (*Table 1*) indicates that the evolution of scientific concepts reflects a gradual transition from traditional educational services marketing to the use of digital technologies, data analytics, and artificial intelligence. At the same time, the concepts examined have not yet developed a comprehensive approach to proactive digital marketing as an integrated system for the strategic management of stakeholder engagement. The mechanisms for anticipating stakeholder needs,

predicting behaviour, initiating managerial actions, continuously monitoring digital interactions, and integrating these processes into the strategic management system of HEIs remain insufficiently explored.

Thus, the current state of scientific research indicates the absence of a comprehensive concept of proactive digital marketing of educational services that would combine structural components, managerial mechanisms, digital technologies, and artificial intelligence into a unified system aimed at anticipating stakeholder needs, creating long-term value for educational services, and strengthening the competitive positions of HEIs.

In view of the above, the aim of this article is to develop the conceptual foundations of proactive digital marketing of educational services as an integrated system for the strategic management of stakeholder engagement and to substantiate the functional role of artificial intelligence as a mechanism for integrating the managerial processes involved in its implementation in HEIs.

To achieve this aim, the following objectives have been established:

- analyse the evolution of scientific approaches to the development of educational services marketing under conditions of digital transformation;
- examine global practices in the development and application of proactive digital marketing by higher education institutions;
- systematise the structural components of proactive digital marketing of educational services;
- substantiate the managerial mechanisms for its implementation in higher education institutions;
- reveal the role of artificial intelligence as an integrating mechanism of proactive digital marketing of educational services;
- identify the organisational, technological, and managerial prerequisites for implementing an AI-oriented model of proactive digital marketing (PDM) within the strategic management system of a higher education institution.

The study is based on the hypothesis that proactive digital marketing of educational services is not a collection of separate digital tools but an integrated system for managing stakeholder engagement, the effectiveness of which is ensured by the synergy of mechanisms for forecasting, personalisation, monitoring, automation, and support for managerial decision-making. Within this system, AI performs an integrative function by enabling the interconnected application of these mechanisms and facilitating the transition from a reactive digital marketing model to proactive management of the creation, promotion, and delivery of educational services.

The research methodology is based on a combination of systemic, structural-logical, comparative, and conceptual approaches to examining contemporary scholarly works and international analytical reports by the European Commission n.d., the OECD (2026, January 19), UNESCO (2023), QS (2025, June 12), and the Pew Research Center (2024, December 12). To achieve the research aim, the study employs methods of scientific generalisation and systematisation, comparative analysis, content analysis of

case studies of leading universities worldwide, conceptual modelling, and graphical visualisation of the results.

Structurally, the article consists of three sections. The first examines global practices in the development and application of proactive digital marketing by HEIs and systematises its structural components. The second section addresses the managerial dimension of PDM of educational services and identifies its key mechanisms: forecasting stakeholder needs and behaviour, personalising digital interactions, monitoring educational trajectories, automating marketing communications, and providing information and analytical support for managerial decision-making. The third section substantiates the integrative function of AI within the system of managerial mechanisms of proactive digital marketing and identifies the prerequisites for its effective implementation in the strategic management system of HEIs.

1. Global practices in the development of proactive digital marketing in higher education institutions

The digital transformation of higher education has led to changes in universities' approaches to marketing activities. Leading HEIs worldwide are gradually transitioning to a proactive digital marketing model focused not only on responding to already established demand but also on anticipating needs and predicting the behaviour of prospective applicants, personalising digital interactions, and applying AI, predictive analytics, and marketing process automation to establish long-term relationships with stakeholders. This involves not merely the use of digital communication channels, websites, and social media, but also the development of integrated digital stakeholder engagement systems whose functioning is based on the use of data, analytical technologies, automation tools, AI, and personalised communications (*Table 2*).

Table 2

Global practices in the development of proactive digital marketing in higher education institutions

Development Stage	Period	Key Characteristics	University Cases	Manifestations of Proactivity
Digitalisation of Educational Activities	2000–2010	Development of digital infrastructure, open educational resources, LMS, university websites, and online communications	Massachusetts Institute of Technology (OpenCourseWare), The Open University	Expanded access to educational services, development of a global digital audience, and growth of digital interaction
Data-Driven Stakeholder Engagement Management	2010–2020	CRM systems, Learning Analytics, marketing automation, digital analytics, and communication personalisation	Arizona State University, The Open University, University of Arizona	Forecasting educational needs, early identification of risks, and personalised interaction with prospective applicants and students

End of Table 2

Development Stage	Period	Key Characteristics	University Cases	Manifestations of Proactivity
AI-Driven Digital Marketing	Since 2020	Generative artificial intelligence, predictive analytics, digital assistants, omnichannel communications, and automated decision-making	Arizona State University, National University of Singapore, University of Michigan, Georgia State University	Predicting prospective applicants' behaviour, AI-based personalisation, automated recommendations, and data-driven decision support

Source: compiled by the authors based on (Brand et al., 2026; Boroowa & Herodotou, 2022; Georgia State University, n. d.; Hernández-de-Menéndez et al., 2022; Kukulska-Hulme et al., 2020; Massachusetts Institute of Technology, n. d.; National University of Singapore, n. d.; Renick, 2022; The Open University, n. d.).

The synthesis of the results presented in *Table 2* indicates that the features of a proactive approach can be traced back to the early stages of universities' digital transformation, when open digital learning environments and online platforms began to be used not only to disseminate learning materials but also as tools for establishing long-term relationships with a global educational audience. The subsequent development of digital technologies led to a transition towards models based on the use of CRM systems, Learning Analytics, predictive analytics, and automated communications. This made it possible to predict the behaviour of prospective applicants and students, identify their needs in a timely manner, personalise communications, and provide anticipatory support. The practices of The Open University and Arizona State University are particularly representative in this context, as both institutions have integrated digital analytics into their stakeholder relationship management systems.

The effectiveness of implementing proactive digital marketing practices is reflected not only in the expansion of universities' digital presence but also in improved student engagement, retention, and academic performance.

A compelling example in this context is the experience of Georgia State University, where the GPS Advising system, based on predictive analytics and more than 800 risk indicators, enables continuous monitoring of individual student learning trajectories, automatic identification of academic failure risks, and the initiation of personalised support measures by academic advisers. Its application has made it possible to move from a reactive student support model to proactive management of students' learning and academic development.

According to the university, the implementation of GPS Advising contributed to a 7-percentage-point increase in the four-year graduation rate, a reduction in the average time to degree completion by more than half a semester, and the delivery of over 90,000 personalised support interventions

during the past year. Thus, the use of predictive analytics has transformed digital communications from a means of providing information into a strategic tool for managing student engagement, retention, and academic performance (Renick, 2022; Georgia State University, n.d.).

The case of The Open University demonstrates another dimension of proactive digital marketing, associated with the use of Learning Analytics to manage the student experience and improve the effectiveness of interactions with students. The university employs analytical tools to predict academic difficulties at an early stage, identify students who require additional support, and personalise appropriate interventions based on digital footprints generated within the virtual learning environment. Research conducted using the Open University Learning Analytics Dataset confirms that data on student activity on digital platforms, login frequency, completion of learning assignments, and patterns of online interaction can be used to predict learning outcomes and the likelihood of successful course completion. This enables the university to move from responding to existing academic problems to proactively managing individual student learning trajectories (Boroowa & Herodotou, 2022; Kukulska-Hulme et al., 2020).

In the context of PDM, the experience of The Open University is important because it demonstrates the expansion of marketing logic beyond the applicant recruitment stage. Within this model, digital marketing encompasses the entire lifecycle of interaction with students, from generating initial interest in an educational programme to supporting academic achievement, improving student retention, fostering a positive digital experience, and creating long-term value from educational services.

The experience of Arizona State University is also noteworthy, as the university consistently integrates CRM technologies, digital services, data analytics, and personalised communications into its system of interaction with prospective applicants and students. In this case, proactivity is reflected not only in the digital support provided to students but also in the university's ability to scale its educational offerings in line with the needs of different target audience segments, including online students, working adults, international students, and individuals requiring flexible learning pathways.

The development trajectory of Arizona State University demonstrates that the integration of digital technologies into marketing and educational activities has contributed to a substantial expansion of student enrolment. Specifically, the total number of students at ASU increased from 76.7 thousand in 2013 to over 160 thousand in 2025, while the number of online students rose from approximately 10 thousand to more than 81 thousand. These figures provide grounds for viewing digital services, CRM-oriented communications, and data analytics not merely as tools for supporting the educational process but also as components of the university's

strategic expansion and the strengthening of its presence in the educational services market (Hernández-de-Menéndez et al., 2022).

The case of Arizona State University demonstrates that PDM in higher education can facilitate a transition from traditional recruitment to the management of a digital educational ecosystem, within which the university anticipates the needs of different stakeholder groups, personalises communications, expands access to educational programmes, and creates long-term value for students.

The synthesis of the results of the analysis of global practices provides grounds for asserting that the effectiveness of PDM is manifested not so much in the expansion of universities' digital presence as in improving the effectiveness of stakeholder engagement, particularly in attracting prospective applicants, retaining students, improving academic performance, and enhancing the soundness of managerial decisions. Despite differences in the digital strategies of individual universities, the results of the content analysis reveal a common logic underlying the implementation of PDM, based on the integration of data, analytical technologies, personalised communications, automation, and mechanisms for anticipatory managerial response (*Figure 2*).

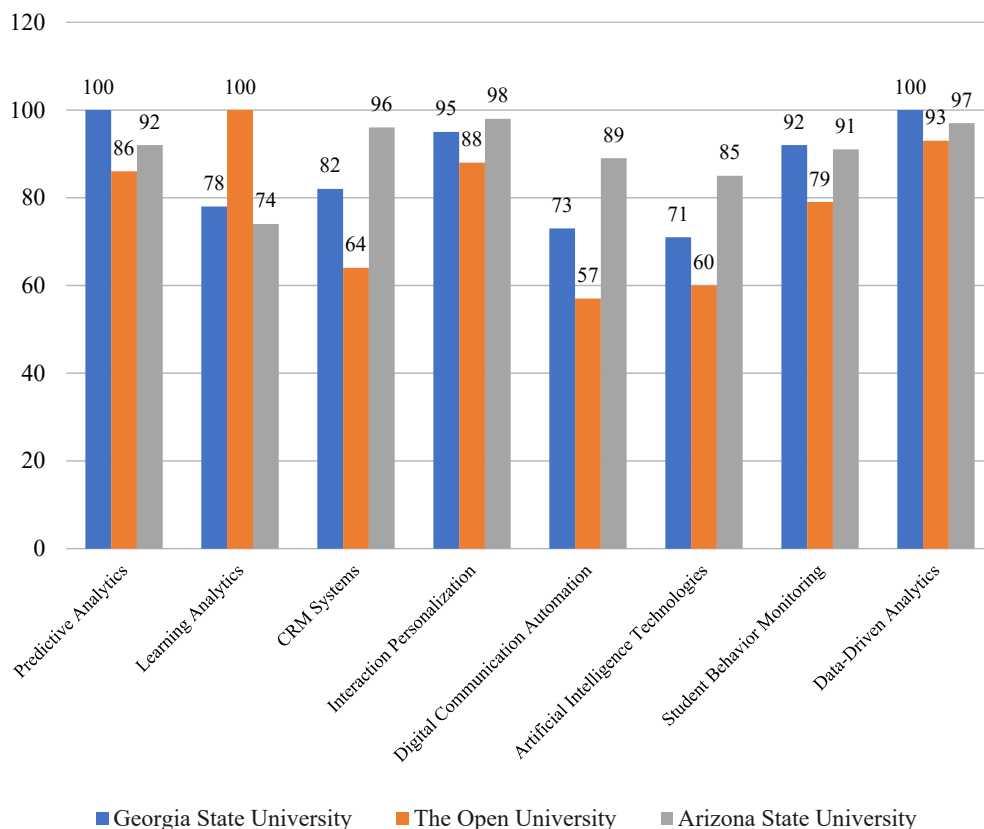


Figure 2. Results of the content analysis of proactive digital marketing tools (%)

Source: compiled by the authors based on (Arizona State University, n. d.; Boroowa & Herodotou, 2022; Georgia State University, n. d.; Hernández-de-Menéndez et al., 2022; Kukulska-Hulme et al., 2020; Renick, 2022; The Open University, 2026, June 1).

Thus, the results of the content analysis demonstrate that the defining characteristic of PDM at leading universities is not the use of individual digital technologies as such, but their integration into a comprehensive system for managing stakeholder engagement. The most widespread management mechanisms include forecasting stakeholder needs and behaviour, personalising digital interactions, data-driven management, providing information and analytical support for decision-making, and focusing on the creation of long-term value from educational services.

CRM systems, Learning Analytics, AI technologies, marketing automation, and other digital solutions serve as technological enablers for implementing these mechanisms rather than constituting independent components of proactive marketing. This provides grounds for asserting that PDM of educational services develops around a set of interrelated management mechanisms that ensure the anticipatory identification of stakeholder needs, forecasting of their behaviour, personalisation of communications, support for managerial decision-making, and the creation of long-term value. A systematisation of the common logic underlying their implementation in the practices of leading higher education institutions is presented in *Table 3*.

Table 3

Structural Components of Proactive Digital Marketing
of Educational Services

Component	Content Characterisation	Practical Implementation in Higher Education Institutions
Technological	Reflects the digital foundation of proactive marketing, associated with the use of CRM systems, Learning Analytics, predictive analytics, artificial intelligence, marketing automation, digital platforms, and personalised services	Establishing a unified digital environment for engagement with prospective applicants, students, alumni, employers, and other stakeholders
Managerial	Characterises the university's ability to use data, analytics, and digital tools to forecast stakeholder needs, support managerial decision-making, and strategically develop educational services	Transitioning from reactive responses to requests to data-driven management of stakeholder engagement
Communication	Reflects a change in the nature of the university's interaction with target audiences, from mass information dissemination to personalised, omnichannel, and automated digital communications	Personalised engagement with prospective applicants and students at all stages of their educational journey
Value-oriented	Reveals the ability of proactive digital marketing to create long-term value from educational services for prospective applicants, students, alumni, employers, the university, and society	Improving recruitment effectiveness, increasing student engagement and retention, strengthening the university's digital reputation, and expanding its educational audience

Source: compiled by the authors.

The synthesis of the structural components presented provides grounds for asserting that PDM of educational services cannot be reduced to the use of a single information system or a set of digital tools. Its essence is

determined by the integration of technological, managerial, communication, and value-oriented components into a comprehensive system for the strategic management of stakeholder engagement. In this context, CRM systems, Learning Analytics, predictive analytics, marketing automation, and AI technologies provide the technological infrastructure for the functioning of this system, whereas forecasting, personalisation, monitoring, communication automation, and information and analytical support for decision-making constitute its key management mechanisms. The nature of their combination and practical implementation depends on the strategic objectives, level of digital maturity, and managerial capacity of HEIs. The identified pattern provides a theoretical basis for further substantiating the managerial dimension of PDM of educational services.

2. The managerial dimension of proactive digital marketing of educational services

Under conditions of full-scale war, population decline, and intensifying international competition in the global educational services market, the managerial dimension of PDM assumes strategic importance for ensuring the competitiveness and sustainable development of Ukraine's higher education system. One of the most serious challenges is the intensification of youth educational migration, accompanied by a decline in the number of prospective applicants, heightened competition between universities, and an increased risk of human capital loss.

According to UNESCO, in 2024, 664.6 thousand Ukrainian children and young people were integrated into formal education systems in European countries, substantially expanding the potential pool of prospective applicants to higher education institutions abroad. At the same time, even before the outbreak of the full-scale war, more than 80 thousand Ukrainian citizens were pursuing higher education at foreign universities, while the scale of academic mobility among Ukrainian youth increased significantly after 2022 (UNESCO, n. d.).

Taken together, population decline, external migration, and growing academic mobility create long-term risks to the country's human resources, scientific, and innovation potential. Under these conditions, Ukrainian HEIs compete not only with one another but also with foreign universities for prospective applicants. Consequently, PDM extends beyond the function of informational promotion of educational programmes and assumes the status of a strategic mechanism for managing the competitiveness of HEIs, enabling the forecasting of target audiences' needs and behaviour, personalisation of engagement, enhancement of the attractiveness of educational programmes, strengthening of trust in the national higher education system, and creation of conditions for curbing educational migration.

The proactive nature of digital marketing is of particular importance, as it makes it possible to move from responding to a decline in the number of prospective applicants to proactively shaping their motivation, supporting their educational trajectories, and building long-term relationships between HEIs and stakeholders. Under these conditions, the competitiveness of a modern university is increasingly determined not by the intensity of marketing communications, but by its ability to forecast the behaviour of prospective applicants, adapt its educational offerings in a timely manner, and personalise digital interactions.

In this regard, PDM should be considered not as a set of individual digital tools or communication channels, but as an integrated system for the strategic management of stakeholder engagement, aimed at the anticipatory identification of their needs, forecasting their behaviour, personalising digital interactions, automating marketing processes, and providing data-driven information and analytical support for decision-making. This approach significantly broadens the traditional interpretation of digital marketing, shifting it from the functional level of implementing marketing activities to the level of strategic management of HEI development.

From the perspective of contemporary management theory, the practical implementation of such a system is ensured by a set of interrelated management mechanisms that determine the logic of digital interaction between HEIs and stakeholders and ensure its proactive nature. Within this study, a management mechanism is interpreted as a means of exercising managerial influence that ensures the transformation of the potential of digital technologies into specific managerial actions, procedures, and strategic decisions.

Thus, identifying a system of management mechanisms makes it possible to explain the transition from a reactive model of digital marketing to a proactive one, reveal the internal logic of its functioning, and demonstrate how digital technologies are integrated into a comprehensive system of strategic management aimed at creating long-term value from educational services and ensuring the competitiveness of a higher education institution. The synthesis of theoretical principles and the results of the analysis of global practices made it possible to conceptualise a system of management mechanisms for implementing PDM of educational services. The proposed system encompasses five interrelated components: forecasting, personalisation, monitoring, automation, and support for managerial decision-making (*Figure 3*).

The proposed system conceptualises the managerial logic of PDM of educational services, within which digital technologies provide instrumental support, while the decisive factor in its effectiveness is the coordinated functioning and mutual reinforcement of management mechanisms.

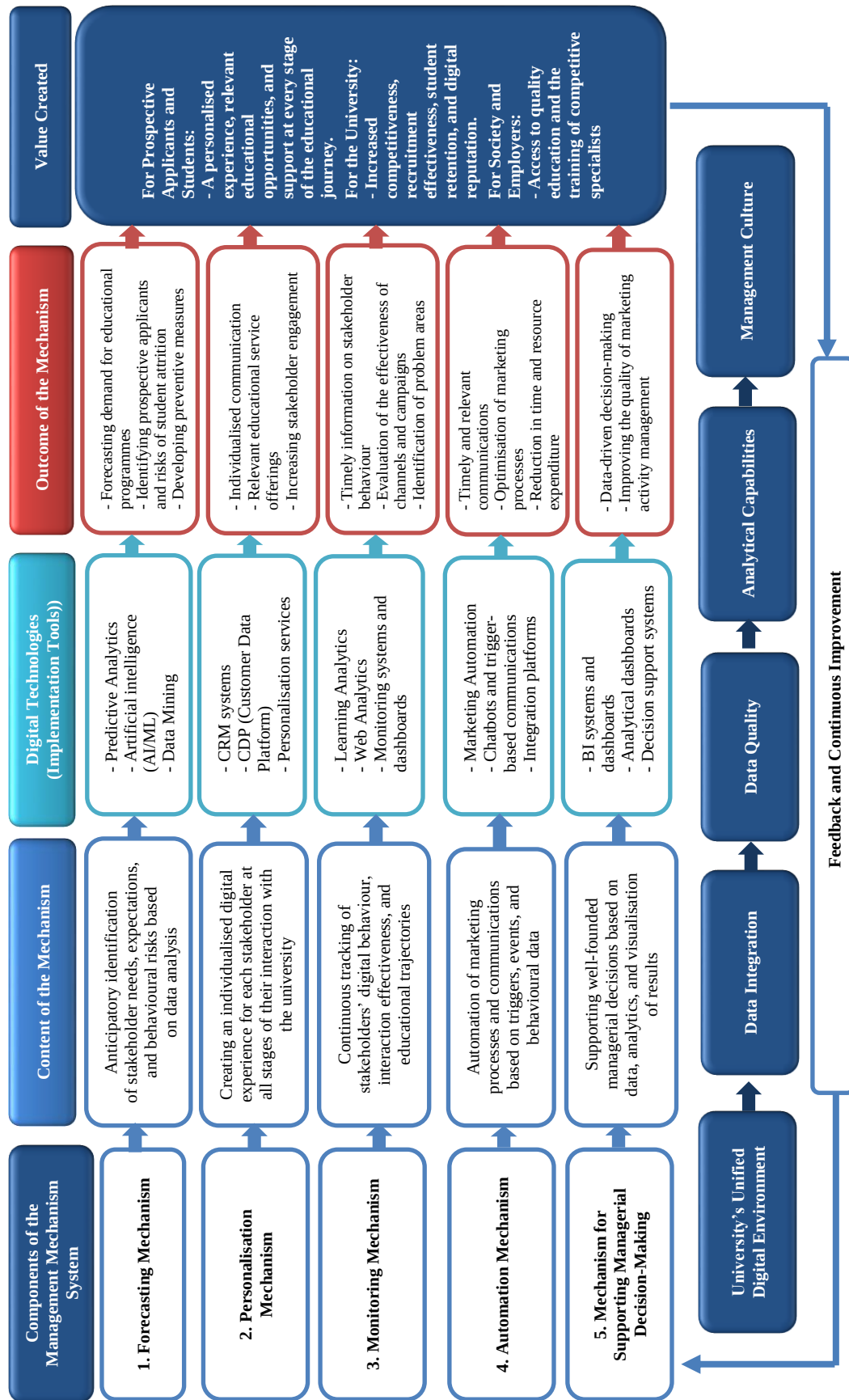


Figure 3. System of management mechanisms for proactive digital marketing of educational services

Source: compiled by the authors.

The synthesis of the research findings provides grounds for asserting that the level of development of PDM of educational services is determined not by the number of implemented digital technologies or information systems, but by the degree of integration and synergistic interaction of key management mechanisms. To conceptualise this relationship, a synergy function is proposed, reflecting the integrated impact of the coordinated interaction of key management mechanisms on the development of proactive digital marketing of educational services (1).

$$PM = F_{Sy}(Pr, P, M, A, D), \quad (1)$$

where: *PM* – proactive digital marketing of educational services;

Sy – synergy function of management mechanisms;

Pr – prediction;

P – personalisation;

M – monitoring;

A – automation;

D – support for managerial decision-making.

The proposed function is conceptual in nature and is intended to provide a formalised representation of the relationship between the key management mechanisms involved in implementing PDM of educational services. The synergy function *Sy* characterises the degree of integration, coordination, and mutual reinforcement of the mechanisms of forecasting, personalisation, monitoring, automation, and support for managerial decision-making within a unified stakeholder engagement management system. Unlike traditional approaches, in which the effectiveness of digital marketing is associated primarily with the use of individual technological solutions, the proposed approach is based on the premise that proactivity results from the integrated and coordinated functioning of interrelated management mechanisms and cannot be achieved through the isolated application of individual digital technologies. Accordingly, an increase in the level of synergy between these mechanisms enhances HEIs' ability to anticipate stakeholder needs, personalise digital interactions, adapt to changes in the external environment in a timely manner, improve the soundness of managerial decisions, and create long-term value from educational services.

Thus, the functioning of PDM of educational services is based on the systematic transformation of data into strategic managerial decisions through the integrated interaction of the mechanisms of forecasting, personalisation, monitoring, automation, and decision-making support. The coordinated interaction of these mechanisms generates a synergistic effect that contributes to enhancing the competitiveness of HEIs, strengthening their digital reputation, increasing student engagement and retention, and creating conditions for reducing the scale of educational migration among Ukrainian youth.

3. Artificial intelligence as an integrator of management mechanisms for proactive digital marketing

The analysis of global practices and the substantiation of PDM management mechanisms have demonstrated that their practical implementation requires not only the use of digital communication channels, CRM systems, and web analytics tools, but also the development of a technological foundation capable of integrating diverse datasets, forecasting stakeholder behaviour, personalising digital interactions, automating marketing processes, and supporting managerial decision-making in near real time.

In this context, AI assumes particular importance and should be considered not merely as a tool for digitalising individual marketing processes, but as an integration technology that ensures the coordinated functioning of PDM management mechanisms.

Unlike traditional digital tools, which are primarily designed for collecting, storing, transmitting, and visualising information, AI technologies are capable of combining analytical, predictive, recommendation, communication, and automation functions. As a result, within the system of proactive digital marketing of educational services, AI emerges not as a separate technological tool, but as a system-wide integrator of the mechanisms of forecasting, personalisation, monitoring, automation, and support for managerial decision-making within a unified management cycle (*Figure 4*).

Unlike traditional digital technologies, which are primarily focused on supporting individual marketing functions, artificial intelligence establishes an end-to-end integration of data and management mechanisms, transforming a set of disparate digital processes into a comprehensive system for the strategic management of stakeholder engagement.

In the proposed model, artificial intelligence serves as a central integrator that accumulates and combines data from CRM and ERP systems, LMS, web analytics tools, social media, and other digital platforms; processes and analyses this data comprehensively; identifies patterns; and establishes an information and analytical basis for forecasting, personalisation, monitoring, automation, and support for managerial decision-making. In this way, artificial intelligence technologies facilitate the coordinated functioning of these mechanisms within a unified management cycle and enhance the proactive nature of digital interaction between HEIs and stakeholders.

Thus, artificial intelligence emerges not as a separate element of the PDM system, but as its integrating component, ensuring the practical implementation of the synergy function of management mechanisms substantiated in the previous section of the study. Through AI technologies, the interaction between the mechanisms of forecasting, personalisation, monitoring, automation, and decision-making support acquires a systemic character, creating the conditions for developing a proactive model of stakeholder engagement management.

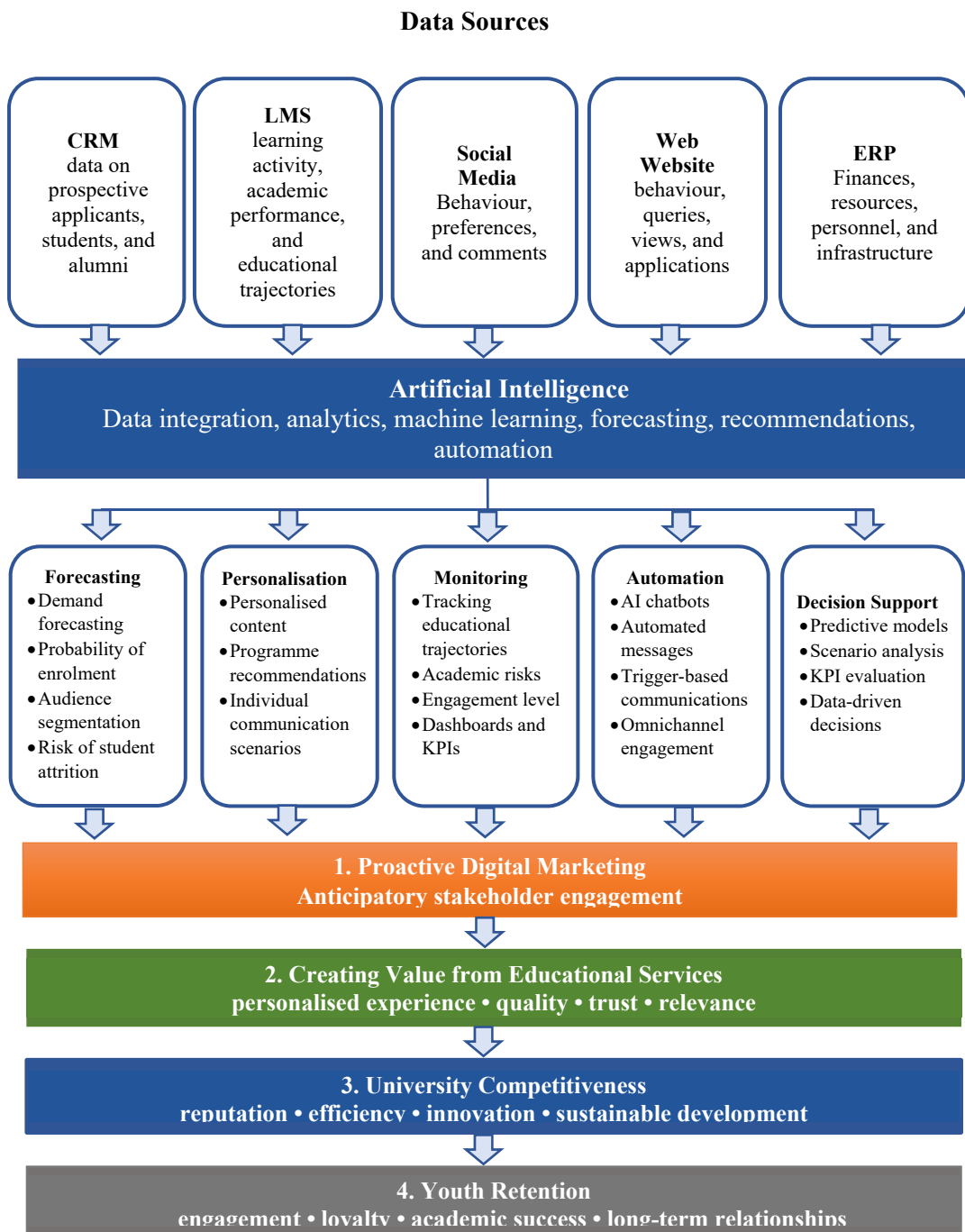


Figure 4. Conceptual model of the integration of data sources and management mechanisms for artificial intelligence-based proactive digital marketing

Source: compiled by the authors.

At the same time, the use of artificial intelligence as an integrator of PDM management mechanisms entails a number of risks and limitations. The effectiveness of its application is determined not only by the level of technological advancement of the relevant solutions, but primarily by the conditions under which they are incorporated into the strategic management

system of HEIs. An analysis of the practices of leading universities demonstrates that even a high level of digitalisation does not guarantee a transition to PDM in the absence of an integrated information environment, adequate data quality, algorithmic transparency, a well-developed digital culture among staff, effective data governance, and robust mechanisms for ethical oversight.

Therefore, the implementation of AI is not a sufficient condition for establishing the proactive nature of digital marketing. A transition to a proactive model becomes possible only through the systematic integration of artificial intelligence technologies into the strategic management of HEIs, where they ensure the synchronisation of management mechanisms, provide information and analytical support, and facilitate their coordinated functioning. For this reason, particular importance should be attached to identifying the prerequisites for the effective implementation of AI technologies in the system of proactive digital marketing of educational services, as summarised in *Table 4*.

Table 4

Organisational and managerial prerequisites for the effective implementation of artificial intelligence in the proactive digital marketing system

Prerequisite	Management Conditions for Implementation	Expected Strategic Outcome
Integrated Data	Establishing a unified university information environment by integrating CRM, LMS, ERP, web analytics, and digital communication channels	Improving the completeness of analytical coverage and the validity of forecasting
Data Quality	Ensuring the reliability, relevance, standardisation, and continuous updating of data	Increasing the accuracy of AI-based analytical results
Integration of Information Systems	Organising automated data exchange between the digital platforms of the higher education institution	Ensuring continuity of digital interaction and consistency of information flows
Algorithmic Transparency	Using explainable artificial intelligence models and ensuring that the recommendations generated can be interpreted	Increasing stakeholder trust in managerial decisions
Digital Competencies of Staff	Developing staff readiness to use AI analytics and make data-driven decisions	Improving the effectiveness of management activities
Ethical Data Governance	Adhering to the principles of digital ethics, confidentiality, security, and responsible data use	Strengthening the social responsibility of the higher education institution

Source: compiled by the authors.

The synthesis of the organisational and managerial prerequisites for the effective implementation of artificial intelligence presented in *Table 4* provides grounds for asserting that the effectiveness of its application within the PDM system is determined not so much by the level of technological sophistication of individual digital solutions as by the degree to which an organisational and managerial environment capable of ensuring their systematic integration and coordinated functioning has been established. To formalise this relationship, an artificial intelligence integration function is proposed:

$$I_{AI}=F(ID,DQ,IS,EX,DC,EG,H), \quad (2)$$

where: I_{AI} – the level of artificial intelligence integration into the proactive digital marketing system, characterising its capacity to ensure the coordinated functioning of the relevant management mechanisms;

ID – Integrated Data;

DQ – Data Quality;

IS – Information Systems Integration;

EX – Explainability;

DC – Digital Competence;

EG – Ethical Governance;

H – Human-Centred Management.

The integration function characterises the capacity of a higher education institution to use artificial intelligence as an integrator of PDM management mechanisms. Unlike existing approaches, it reflects not the level of development of individual AI technologies, but the degree to which the organisational and managerial conditions necessary for their systematic integration into the strategic management of a higher education institution have been established. Each component of the function is a necessary, but not sufficient, condition for the effective implementation of AI. Only their comprehensive interaction makes it possible to realise its integration function, which is manifested in the synchronisation of the mechanisms of forecasting, personalisation, monitoring, automation, and support for managerial decision-making.

Thus, the proposed artificial intelligence integration function provides the conceptual foundation for implementing the synergy function of management mechanisms presented in *Formula (1)*. While the synergy function reflects the outcome of the coordinated functioning of the mechanisms of forecasting, personalisation, monitoring, automation, and support for managerial decision-making, the integration function reveals the organisational and technological means of achieving this outcome through the use of AI. The relationship between these functions can be formalised as follows:

$$Sy=F(I_{AI}), \quad (3)$$

where: Sy – the synergistic outcome of the coordinated functioning of PDM management mechanisms;

I_{AI} – the level of AI integration into the PDM system;

F – a functional relationship reflecting the influence of the level of AI integration on the formation of synergy among management mechanisms;

AI – the AI integration function.

The integration function characterises the capacity of artificial intelligence to ensure the interconnection and synchronisation of individual management mechanisms, whereas the synergy function reflects the outcome of their coordinated functioning in the form of established proactivity in digital marketing. Thus, integration is a prerequisite for achieving a synergistic outcome, while synergy is a necessary condition for the development of PDM of educational services.

The proposed integration function has not only conceptual but also practical significance, as it provides a methodological basis for developing an integral index to assess the capacity of HEIs to integrate AI technologies into the proactive digital marketing system. Operationalising its components makes it possible to move from a conceptual description to a quantitative assessment of the university's level of organisational and digital readiness, conduct comparative analyses of higher education institutions, identify critical areas of digital transformation, and evaluate the effectiveness of AI implementation in the strategic management system.

At the same time, AI's considerable integration potential is not a sufficient condition for improving the effectiveness of marketing activities at HEIs. The effectiveness of its use is determined not only by the technological capabilities of individual digital solutions, but primarily by the degree to which the organisational and managerial environment has been developed, the quality of data, the integration of information systems, the digital competencies of staff, algorithmic transparency, adherence to ethical principles, and the preservation of the human-centred nature of strategic management.

Thus, the results of the study provide grounds for viewing artificial intelligence not as a standalone digital tool, but as a systemic integrator of the management mechanisms of proactive digital marketing of educational services. The proposed integration function complements the synergy function and, together with it, forms a comprehensive conceptual model in which the level of AI integration explains how management mechanisms function in a coordinated manner, while the synergistic outcome reflects the result of their comprehensive interaction. This approach characterises the transition from the fragmented use of digital technologies to the development of an intelligent, proactive, data-driven system for the strategic management of stakeholder engagement, aimed at creating long-term value in educational services, enhancing the competitiveness of higher education institutions, and strengthening Ukraine's human capital.

It should be noted that the implementation of PDM in Ukrainian higher education institutions must take into account the specific characteristics of educational systems operating under martial law. Forced internal and external migration, the geographical dispersal of higher education students, unequal access to digital infrastructure, and the limited financial resources of universities constrain the comprehensive integration of CRM systems, data analytics, and AI technologies. At the same time, these very conditions reinforce the importance of a proactive engagement model capable of enabling the early identification of student attrition risks, the personalisation of digital communications, and the maintenance of continuous interaction with students regardless of their location. This necessitates the phased implementation of the proposed model in accordance with the level of digital maturity, resource capacity, and strategic priorities of each individual HEI.

Conclusions

The study provides grounds for asserting that the current stage of digital marketing development in higher education is characterised by a transition from the use of individual digital technologies and communication channels to the formation of a proactive, integrated, data-driven system for the strategic management of stakeholder engagement. The hypothesis put forward has been confirmed by the sequence of results obtained: a comparative analysis of scientific concepts made it possible to identify the limitations of a fragmented technological approach to digital marketing; a content analysis of the practices of leading universities revealed a common rationale for combining forecasting, personalisation, monitoring, automation, and information and analytical support for managerial decision-making; conceptual modelling made it possible to formalise the relationships between these mechanisms through the synergy function, while the artificial intelligence integration function revealed the mechanism for ensuring their coordinated functioning within a unified management cycle. Taken together, these results confirm that the effectiveness of proactive digital marketing is determined not by the scale of digitalisation as such, but by the level of integration and synergy among interrelated management mechanisms, with artificial intelligence acting as their systemic integrator.

The study proposes a conceptual approach to interpreting proactive digital marketing of educational services as a system for the strategic management of stakeholder engagement based on the anticipatory identification of stakeholders' needs, behavioural forecasting, personalisation of digital interactions, automation of marketing processes, and data-driven support for managerial decision-making. Unlike existing scientific approaches, in which digital marketing is primarily considered through the lens of individual technologies or marketing tools, the proposed concept substantiates its managerial nature and reveals the mechanism of transition from a reactive to a proactive model of higher education institution functioning.

The scientific novelty of the study lies in substantiating a system of interrelated management mechanisms for proactive digital marketing, encompassing forecasting, personalisation, monitoring, automation, and support for managerial decision-making, and developing two interrelated conceptual functions. *The first*, the synergy function, explains the patterns governing the coordinated functioning of management mechanisms; *the second*, the integration function, elucidates the role of artificial intelligence as an integrator of these mechanisms and establishes a conceptual relationship between the organisational and managerial prerequisites for AI implementation and the synergistic outcome of the proactive digital marketing system.

The practical significance of the proposed approach lies in its potential use as a methodological basis for developing digital marketing strategies for higher education institutions, assessing their level of digital maturity and artificial

intelligence integration capacity, and substantiating managerial decisions concerning the digital transformation of universities. The proposed synergy and integration functions provide a theoretical and methodological foundation for developing an integral index to assess higher education institutions' readiness to implement an AI-oriented proactive digital marketing model and for conducting comparative studies across universities.

Prospects for further research include developing a methodology for the quantitative assessment of artificial intelligence integration capacity based on the proposed integration function; constructing an integral index of proactive digital marketing for higher education institutions; testing it on a sample of Ukrainian and international universities; empirically examining the impact of the level of proactive digital marketing on the competitiveness of higher education institutions, student recruitment and retention, international attractiveness, and the reduction of educational migration risks.

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