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SMART MANAGEMENT WITH ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: PRINCIPLES, PRACTICES, AND FUTURE DIRECTIONS

Abstract. This paper delves into the burgeoning integration of Artificial Intelligence (AI) within SMART management frameworks in higher education, addressing the urgent need for innovative governance models in the face of rapid digital transformation and evolving global demands. It highlights the imperative for universities to enhance efficiency, responsiveness, and adaptability through data-driven strategies, particularly in the Ukrainian context, where recent educational reforms emphasize digital integration.

The study examines the conceptual foundations and practical applications of AI-driven SMART management, defined by Specific, Measurable, Achievable, Relevant, and Time-bound objectives. It reviews existing literature on SMART management and AI in higher education, showcasing AI's role in predictive analytics, adaptive learning systems, and automated administrative workflows. These applications empower institutions to optimize resource allocation, personalize learning experiences, and enhance student engagement. A significant portion of the paper focuses on the strategic alignment and infrastructure required for successful AI integration. It underscores the importance of developing robust AI adoption policies, establishing institutional AI committees, and investing in high-performance computing, cloud-based learning management systems, and cybersecurity measures. The paper also explores AI's impact on academic governance, decision-making, teaching, and learning, illustrating how AI-driven analytics can improve enrollment, retention, and resource allocation.

However, the paper acknowledges the multifaceted challenges and ethical considerations associated with AI integration, including data privacy, algorithmic

bias, and academic integrity. It emphasizes the need for ethical guidelines, data governance frameworks, and continuous monitoring to mitigate these risks and foster trust among stakeholders. Furthermore, the paper explores the perspectives and opportunities offered by AI-driven SMART management, such as enhancing student success, fostering collaboration, driving policy innovation, and promoting sustainability. It highlights the potential for Ukrainian universities to leverage AI to enhance their global competitiveness through international partnerships and local expertise development.

The conclusion reiterates the transformative potential of AI-driven SMART management in shaping resilient, learner-centered, and future-ready educational models. It emphasizes the need for a balanced integration of AI within SMART management frameworks, coupled with a strong commitment to ethical standards and continuous improvement. The paper advocates for universities to actively shape the ethical and strategic direction of AI in higher education, ensuring equitable access, academic integrity, and data security in an increasingly digitalized world.

Keywords: SMART management, artificial intelligence, higher education, digital transformation, educational governance, personalization, ethics, Ukraine

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SMART-МЕНЕДЖМЕНТ З ВИКОРИСТАННЯМ ШТУЧНОГО ІНТЕЛЕКТУ У ВИЩІЙ ОСВІТІ: ПРИНЦИПИ, ПРАКТИКИ ТА МАЙБУТНІ НАПРЯМКИ

Анотація. Ця стаття досліджує зростаючу інтеграцію штучного інтелекту (ШІ) в рамках SMART-менеджменту у вищій освіті, розглядаючи нагальну потребу в інноваційних моделях управління в умовах швидкої цифрової трансформації та еволюції глобальних вимог. Вона підкреслює необхідність для університетів підвищити ефективність, оперативність та адаптивність за допомогою стратегій, заснованих на даних, особливо в українському контексті, де останні освітні реформи наголошують на цифровій інтеграції.

Дослідження розглядає концептуальні основи та практичні застосування SMART-менеджменту, керованого ШІ, визначеного як цілі, що є конкретними,

вимірюваними, досяжними, релевантними та обмеженими в часі. Воно аналізує існуючу літературу з SMART-менеджменту та ІІІ у вищій освіті, демонструючи роль ІІІ в предиктивній аналітиці, адаптивних навчальних системах та автоматизованих адміністративних робочих процесах. Ці застосування дозволяють установам оптимізувати розподіл ресурсів, персоналізувати навчальний досвід та підвищити залученість студентів.

Значна частина статті присвячена стратегічному вирівнюванню та інфраструктурі, необхідним для успішної інтеграції ІІІ. Вона підкреслює важливість розробки надійних політик впровадження ІІІ, створення інституційних комітетів з ІІІ та інвестування у високопродуктивні обчислення, хмарні системи управління навчанням та заходи кібербезпеки. Стаття також досліджує вплив ІІІ на академічне управління, прийняття рішень, викладання та навчання, ілюструючи, як аналітика, керована ІІІ, може покращити набір, утримання та розподіл ресурсів. Однак стаття визнає багатогранні виклики та етичні міркування, пов'язані з інтеграцією ІІІ, включаючи конфіденційність даних, алгоритмічну упередженість та академічну доброчесність. Вона наголошує на необхідності етичних рекомендацій, рамок управління даними та постійного моніторингу для зменшення цих ризиків та зміцнення довіри серед зацікавлених сторін.

Крім того, стаття досліджує перспективи та можливості, які пропонує SMART-менеджмент, керований ІІІ, такі як підвищення успішності студентів, сприяння співпраці, стимулювання інновацій у політиці та сприяння стійкості. Вона підкреслює потенціал українських університетів використовувати ІІІ для підвищення своєї глобальної конкурентоспроможності через міжнародні партнерства та розвиток місцевої експертизи.

Стаття підтверджує трансформаційний потенціал SMART-менеджменту, керованого ІІІ, у формуванні стійких, орієнтованих на учнів та готових до майбутнього освітніх моделей. Вона наголошує на необхідності збалансованої інтеграції ІІІ в рамках SMART-менеджменту, у поєднанні з твердим зобов'язанням дотримуватися етичних стандартів та постійного вдосконалення. Стаття закликає університети активно формувати етичний та стратегічний напрям ІІІ у вищій освіті, забезпечуючи рівний доступ, академічну доброчесність та безпеку даних у все більш цифровізованому світі.

Ключові слова: SMART-менеджмент, штучний інтелект, вища освіта, цифрова трансформація, освітнє управління, персоналізація, етика, Україна.

Problem Setting. The accelerating pace of digital transformation, coupled with expanding global demands on higher education, underscores the urgent necessity for innovative management approaches that transcend traditional governance models. Institutions of higher education worldwide are increasingly pressed to demonstrate greater efficiency, responsiveness, and adaptability to

dynamic educational needs and market forces. While technological advancements offer unprecedented opportunities for data-driven decision-making, they simultaneously raise complex questions regarding infrastructure capacity, academic integrity, institutional autonomy, and the ethical handling of vast datasets. Consequently, embracing digital innovation responsibly has become a central imperative for contemporary educational institutions.

In Ukraine, significant educational reforms have been introduced in recent years, promoting the modernization of educational governance and digital integration. This strategic shift is a response to broader socio-economic pressures, including globalization, digitalization, and evolving labor market demands. Policymakers and academic leaders recognize the critical role advanced digital tools and artificial intelligence (AI)-driven analytics play in supporting strategic planning, resource optimization, and improved student learning outcomes. Ukrainian higher education institutions, thus, find themselves at a crossroads, balancing traditional educational methodologies with cutting-edge digital technologies.

Parallel to global practices, Ukrainian scholars and practitioners increasingly advocate for integrating SMART management concepts—originally popularized in public administration and local governance—into higher education contexts. SMART management, broadly understood as a strategic approach encompassing Specific, Measurable, Achievable, Relevant, and Time-bound objectives, leverages information communication technologies (ICT) to streamline processes, optimize resources, and enhance stakeholder engagement. It aligns effectively with principles of continuous improvement and responsiveness, fundamental to addressing modern educational challenges.

In this context, artificial intelligence emerges as a transformative factor within SMART management frameworks, empowering higher education institutions to navigate complexity more effectively. AI facilitates not only routine administrative efficiencies but also delivers powerful analytical insights, predictive capabilities, and personalized educational experiences previously unattainable at scale. AI-enhanced SMART management systems enable institutions to dynamically adjust to changing student needs, labor market trends, and societal expectations, thus significantly elevating both educational quality and institutional effectiveness.

However, the adoption of AI-driven SMART management in higher education also presents multifaceted challenges, including ethical concerns about data privacy, fairness in algorithmic decision-making, and maintaining academic integrity. These concerns necessitate a thoughtful, collaborative approach involving diverse stakeholders—students, faculty, administrators, technologists, and policymakers—in order to responsibly harness the full potential of AI technologies.

Analysis of the latest studies and publications. SMART management, characterized by Specific, Measurable, Achievable, Relevant, and Time-bound

objectives, has increasingly been adopted across various sectors to enhance organizational effectiveness and efficiency. Originating from public administration and urban governance, SMART management has found resonance in higher education, addressing the complexities inherent in contemporary educational institutions [1].

The integration of artificial intelligence (AI) into SMART management systems is transforming higher education by supporting sophisticated decision-making, personalized learning, and administrative efficiency [2]. AI-driven solutions empower universities to process and analyze extensive datasets swiftly, thereby significantly enhancing both institutional operations and educational outcomes.

Key AI-driven SMART management applications in higher education highlighted in the literature include predictive analytics, adaptive learning systems, and automated administrative workflows. Predictive analytics enable institutions to anticipate trends such as student enrollment patterns, academic performance, and potential attrition, allowing for proactive interventions and improved student retention [4]. AI-enhanced adaptive learning platforms tailor educational experiences to individual student needs, optimizing engagement and educational achievement [2]. Additionally, automation of routine administrative tasks like admissions management, scheduling, and reporting significantly reduces operational inefficiencies and enables staff to focus on strategic objectives [1].

Despite these advancements, AI integration presents ethical and operational challenges, particularly concerning data privacy, algorithmic transparency, and academic integrity [3]. Scholars emphasize the necessity of developing comprehensive ethical guidelines and data governance frameworks to mitigate these risks and foster trust among institutional stakeholders. In Ukraine, the adoption of SMART management in higher education aligns closely with national digital transformation initiatives. Ukrainian researchers stress the importance of creating a digitally proficient institutional culture capable of effectively managing and responsibly interpreting AI-driven insights [4].

In summary, the integration of AI with SMART management principles offers significant opportunities for higher education institutions seeking to enhance their operational efficiencies, educational effectiveness, and overall competitiveness in an increasingly digitalized global landscape.

The purpose of the article – the primary aim of this paper, therefore, is to comprehensively explore the conceptual foundations and practical applications of SMART management enhanced by artificial intelligence in higher education. It further aims to highlight critical challenges, propose strategies for overcoming these issues, and provide actionable recommendations to effectively integrate AI-driven SMART management practices within strategic institutional development.

Presentation of the main material. The integration of artificial intelligence (AI) into SMART management systems represents a paradigm shift in the way universities operate, enabling more data-driven, efficient, and personalized

approaches to governance, teaching, and learning. AI-driven SMART management enhances strategic decision-making, optimizes administrative processes, and fosters a more engaging and adaptive educational environment. However, successful implementation requires careful planning, investment in infrastructure, and adherence to ethical and data privacy principles.

For AI-driven SMART management to be successfully implemented, universities must ensure that their strategic objectives are aligned with broader digital transformation initiatives. This requires the establishment of a robust institutional framework that fosters technological adoption while addressing ethical, operational, and governance concerns.

One of the fundamental steps in this process is the development of clear AI adoption policies, which outline how artificial intelligence will be integrated into various aspects of educational governance. These policies must address key ethical considerations, ensuring that AI-driven decision-making processes remain transparent, fair, and accountable to institutional stakeholders [1].

Additionally, universities should establish institutional AI committees, composed of interdisciplinary teams responsible for overseeing AI development, ensuring ethical compliance, and maintaining data security. These committees would play a crucial role in shaping AI strategies, evaluating risks, and guiding institutions through the complexities of AI implementation.

Equipping educators and administrators with AI competencies is another critical component of SMART management. Universities must invest in faculty and staff training, offering specialized workshops and continuous professional development programs focused on AI applications in education. This training will enable educators to effectively integrate AI tools into their teaching methodologies, administrative processes, and research activities.

Finally, the success of AI-driven SMART management depends on stakeholder engagement, which involves the active participation of students, faculty, and policymakers in the decision-making process. Creating inclusive forums for discussion, gathering feedback, and fostering collaboration among these groups will ensure transparency and encourage widespread support for AI-driven initiatives. A participatory approach to AI adoption not only strengthens institutional trust but also ensures that the technology serves the diverse needs of the academic community [2].

A well-developed digital infrastructure is a crucial foundation for the successful implementation of AI-driven SMART management in universities. To fully harness the potential of artificial intelligence in education, institutions must make strategic investments in key technological components that enable efficiency, scalability, and security.

One of the primary requirements is the adoption of high-performance computing systems, which are essential for real-time data processing and AI model training. These advanced computing resources allow universities to handle large volumes of academic, administrative, and research data efficiently, facilitating complex AI-driven analytics and predictive modeling.

Another critical investment is in cloud-based learning management systems (LMS), which provide scalable and flexible solutions for AI-enhanced education. By leveraging cloud technology, universities can offer students and faculty seamless access to personalized learning environments, adaptive assessments, and intelligent tutoring systems. Cloud-based platforms also support collaborative learning, remote education, and integration with AI-driven tools for enhanced student engagement.

Ensuring cybersecurity measures is equally important, as AI adoption introduces new risks related to data privacy and security. Universities must implement robust security protocols to safeguard sensitive student records, research data, and institutional information from cyber threats and unauthorized access. Compliance with data protection regulations and the development of AI-specific security frameworks will be necessary to build trust and ensure responsible AI usage in higher education [4].

Universities must prioritize the development of interoperable data platforms that allow for seamless integration of AI technologies with existing databases and decision-support systems. These platforms play a crucial role in facilitating efficient data exchange across different departments, ensuring that AI-generated insights are readily available and actionable for university leadership, faculty, and administrators. By implementing a well-integrated system, institutions can enhance decision-making processes, optimize resource allocation, and significantly improve the overall efficiency of both academic and administrative operations.

Figure 1 illustrates the key infrastructure components essential for AI-driven SMART management in universities, highlighting Computing Power (90%), Cloud Platforms (85%), Cybersecurity (80%), and Data Integration (88%) as critical factors. Among these, computing power and data integration are slightly more prioritized, emphasizing the need for high-performance processing capabilities and seamless data flow to support AI-driven decision-making and educational enhancements.

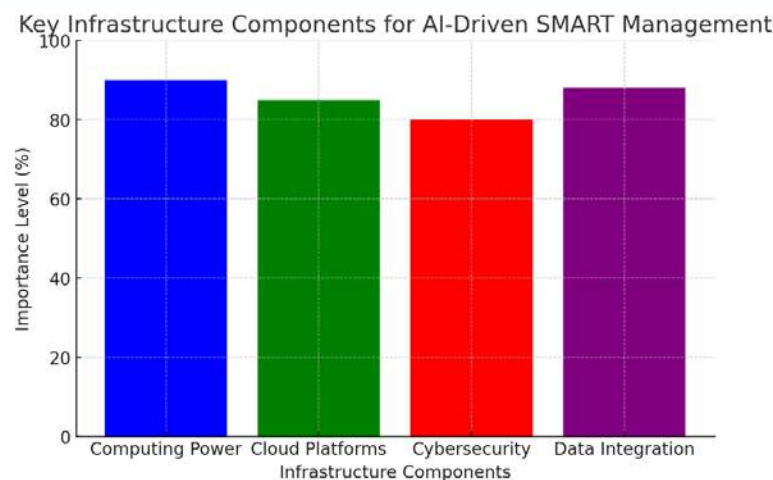


Figure 1: Key Infrastructure Components for AI-Driven SMART Management

AI-driven data analytics play a pivotal role in enhancing transparency, accountability, and overall efficiency within university administration. By leveraging AI-powered insights, institutions can make informed decisions that optimize resources, improve student outcomes, and streamline operational processes.

One of the key applications of AI in academic governance is predictive analytics for enrollment and retention. AI models analyze historical and real-time data to forecast student enrollment trends and identify individuals at risk of dropping out. This enables universities to implement proactive interventions, such as personalized academic support or targeted mentorship programs, to improve student retention rates and overall institutional success [3].

Another critical function of AI-driven analytics is resource allocation optimization, which aids in budget planning, faculty workload management, and space utilization. AI algorithms assess various factors, including course enrollments, classroom availability, and faculty assignments, to ensure that resources are allocated efficiently. This not only reduces operational costs but also enhances the quality of education by ensuring an optimal balance of teaching and administrative responsibilities.

Moreover, universities gain significant advantages from performance monitoring dashboards, which offer real-time insights into essential academic and institutional metrics. These dashboards continuously track student progress, faculty workload, and overall institutional performance, enabling administrators to make informed, data-driven decisions promptly. By analyzing and visualizing trends, universities can proactively implement strategic improvements to enhance academic achievement and optimize operational efficiency.

The diagram 1 illustrates the AI-driven decision-making process in universities, showcasing how AI collects, processes, and analyzes institutional data to optimize administrative and academic functions. It depicts a workflow where data from various sources (student performance, faculty workload, resource utilization, and institutional policies) is fed into AI models, which generate predictive insights and actionable recommendations, enabling informed decision-making in areas such as enrollment, budgeting, and academic planning.

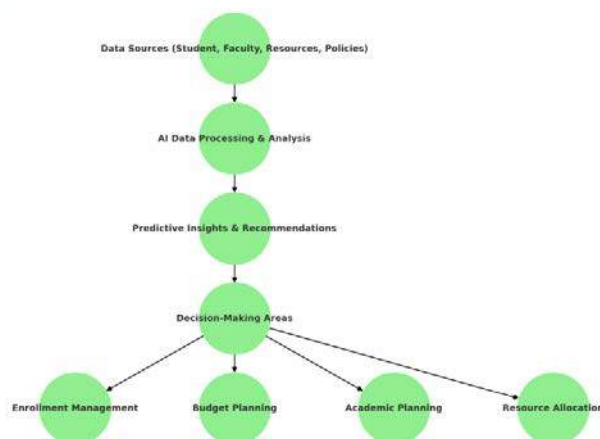


Diagram 1: AI-Driven Decision-Making Process in Universities

In the modern classroom, AI-driven SMART management systems are transforming teaching methodologies and significantly enhancing student engagement. These systems leverage artificial intelligence to create personalized learning experiences, optimize instructional strategies, and provide data-driven insights that improve educational outcomes.

One of the most impactful applications of AI in education is the development of personalized learning paths. Adaptive learning platforms dynamically adjust coursework difficulty based on individual student progress and comprehension levels, ensuring that each learner receives tailored instruction that matches their needs and capabilities. This approach fosters deeper engagement, enhances knowledge retention, and helps students progress at their own pace.

Additionally, smart tutoring systems powered by AI are revolutionizing student support mechanisms. These intelligent chatbots and virtual assistants provide instant feedback, personalized learning recommendations, and on-demand academic assistance, helping students overcome learning obstacles in real-time [2]. By offering round-the-clock support, AI-powered tutoring enhances accessibility and ensures that students receive timely guidance outside of traditional classroom settings.

Another key advancement in AI-driven education is the integration of automated assessment tools, which streamline the evaluation process and provide educators with in-depth analytics on student performance. AI-enhanced grading systems efficiently assess assignments, detect patterns in student learning, and offer detailed feedback, reducing the administrative burden on educators while improving the accuracy and consistency of assessments.

To illustrate the effectiveness of AI-driven learning, figure 2 compares traditional learning models with AI-powered personalized learning in terms of student engagement, retention, and overall learning outcomes. The data highlights how AI-driven approaches lead to higher engagement levels, improved knowledge retention, and more effective learning experiences by adapting to individual student needs. As universities continue to embrace AI-driven SMART management, these technologies are set to redefine educational experiences, making learning more dynamic, efficient, and student-centered.

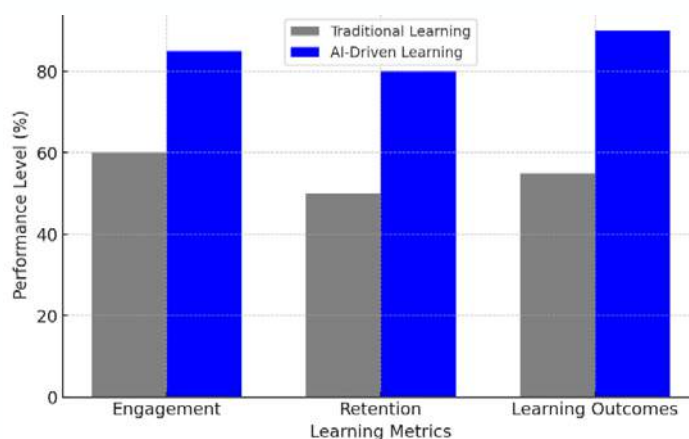


Figure 2: Benefits of AI-Driven Learning Systems

Despite its numerous benefits, the implementation of AI-driven SMART management in universities presents several challenges that must be carefully addressed to ensure ethical, fair, and effective adoption. These challenges primarily relate to data privacy and security, bias in AI algorithms, and resistance to change, all of which require strategic solutions to mitigate risks and build institutional trust.

One of the most pressing concerns is data privacy and security, as universities handle vast amounts of sensitive student and faculty information. Ensuring compliance with data protection regulations, such as GDPR, and implementing robust security measures is essential to safeguard personal data and prevent unauthorized access. Ethical AI use must also be prioritized to maintain transparency and uphold the rights of all stakeholders involved [4].

Another significant challenge is bias in AI algorithms, which can lead to unfair outcomes if not properly managed. AI models, when trained on incomplete or biased datasets, may inadvertently reinforce existing inequalities in areas such as admissions, grading, and resource distribution. To prevent discrimination, universities must regularly audit their AI systems, incorporate diverse and representative data, and develop algorithms that prioritize fairness and inclusivity.

To fully harness the potential of AI-driven SMART management, universities must implement strategic measures that ensure ethical, effective, and sustainable integration of AI technologies into higher education. These efforts should focus on developing ethical frameworks, fostering collaboration, enhancing AI literacy, and continuously monitoring AI's impact on institutional operations.

A crucial step in this process is the development of ethical AI guidelines, which provide a regulatory framework for the responsible use of AI in higher education. These guidelines should outline best practices for transparency, fairness, and accountability, ensuring that AI systems are used to enhance education without compromising student rights or institutional integrity.

Furthermore, universities should encourage collaborative efforts by sharing AI research, datasets, and best practices across institutions. This exchange of knowledge fosters innovation, accelerates technological development, and ensures that AI applications align with global educational standards. Through cooperation, universities can create more advanced and impactful AI-driven solutions that enhance the entire academic ecosystem.

Investing in AI literacy programs is another essential strategy for preparing students and faculty for an AI-driven future. Equipping educators with AI-related skills enhances their ability to integrate intelligent technologies into teaching methodologies, while students gain valuable competencies that improve their career readiness. AI-focused training programs, workshops, and interdisciplinary courses can help bridge the knowledge gap and create a technologically adept academic community.

To ensure long-term success, universities must also monitor AI impact by regularly assessing its effectiveness in improving operational efficiency, decision-making, and student engagement. Continuous evaluation allows institutions to identify challenges, refine AI strategies, and make data-driven adjustments to maximize the benefits of AI integration.

As universities integrate AI-driven SMART management into their operations, they must address several challenges and ethical concerns to ensure responsible and effective implementation. Key issues include data security and privacy, fairness and algorithmic bias, and academic integrity in AI-supported environments. Addressing these challenges requires a combination of robust security measures, ethical oversight, and clear institutional policies.

Universities handle vast amounts of sensitive information, including student records, faculty data, and research outputs, making cybersecurity a top priority. The introduction of AI systems adds new vulnerability points, increasing the risk of data breaches and unauthorized access. To mitigate these risks, institutions must implement robust encryption, conduct regular security audits, and provide staff training in cybersecurity best practices. Additionally, compliance with data protection regulations is essential to ensure AI-driven systems handle personal data responsibly. Defining clear data ownership parameters and establishing transparent consent procedures further protect individuals' privacy and maintain institutional trust [3].

While AI has the potential to enhance decision-making, machine learning models can inadvertently replicate historical inequities or institutional biases present in their training data. If left unaddressed, biased AI systems may produce unfair outcomes in areas such as student admissions, grading, and resource distribution. To ensure fairness, universities must conduct rigorous audits of algorithmic decision-making, regularly update datasets to reflect diverse student demographics, and seek input from interdisciplinary experts and ethicists to refine AI policies. Creating inclusive AI models will help mitigate biases and promote equitable access to educational opportunities.

The rise of AI-generated content and automated learning tools raises concerns regarding plagiarism, authorship, and the authenticity of student work. AI-driven writing assistants, code generators, and automated assessment tools challenge traditional methods of evaluating academic integrity. To maintain ethical standards, universities must refine academic integrity policies to address AI-based tools explicitly. Additionally, institutions should develop advanced detection methods to distinguish between human and AI-generated work, ensuring accountability in assessments. Rather than prohibiting AI outright, universities should establish clear guidelines that encourage responsible AI usage, equipping students with ethical frameworks for using AI in academic settings [3].

The integration of SMART management principles with artificial intelligence offers transformative opportunities for higher education institutions, enabling them to enhance student success, foster collaboration, drive policy innovation, and promote sustainability. By leveraging AI-driven technologies, universities can create more adaptive, data-driven, and future-ready academic ecosystems.

AI-powered adaptive learning platforms play a critical role in enhancing student success by identifying at-risk learners at an early stage. By analyzing performance patterns and engagement levels, AI systems can deliver personalized learning pathways, targeted academic support, and real-time interventions, helping students stay on track and improve learning outcomes. These technologies not only reduce dropout rates but also foster a more inclusive and student-centered educational environment.

AI-driven data-sharing systems facilitate collaboration between universities, enabling seamless exchange of research insights, academic resources, and best practices. Shared AI-powered platforms support benchmarking activities, allowing institutions to compare performance metrics, identify areas for improvement, and collectively develop innovative solutions. This collaborative approach fosters knowledge-sharing across institutions and enhances the global competitiveness of higher education.

AI-driven predictive modeling empowers university administrators and policymakers to make informed, data-driven decisions. By simulating different policy scenarios, AI can forecast potential outcomes, helping institutions experiment with new strategies while mitigating risks. Whether optimizing course offerings, adjusting resource allocations, or designing more effective student support programs, AI-driven policymaking enables universities to remain agile and responsive to evolving educational needs.

AI-assisted resource management plays a crucial role in promoting environmental sustainability and cost-effectiveness. Smart campus initiatives leverage AI to optimize energy consumption, streamline facility management, and reduce waste. AI-driven automation can improve efficiency in campus logistics, transportation, and administrative workflows, ultimately contributing to sustainable and eco-friendly university operations [1].

For Ukrainian universities, integrating AI into SMART management presents a unique opportunity to leverage advanced data analytics and develop homegrown AI expertise. Through international collaboration, institutions can access global best practices, participate in AI research networks, and establish partnerships with leading technology firms. These efforts will contribute to an agile, forward-thinking, and globally competitive higher education sector that drives innovation, economic growth, and academic excellence.

Conclusions. The integration of SMART management principles with AI technologies has the potential to redefine the landscape of higher education, driving

institutional efficiency, academic innovation, and enhanced learning experiences. AI-powered SMART management systems optimize decision-making, streamline administrative processes, and personalize education, ensuring that universities remain agile and responsive in an evolving digital era. However, the successful deployment of these technologies requires a robust digital infrastructure, well-defined policies, transparent data governance, and a strong commitment to ethical standards.

For Ukrainian universities, this transformation comes at a crucial time. With policy reforms, international collaborations, and growing local AI expertise, institutions are uniquely positioned to embrace AI-driven innovations and strengthen their global competitiveness. By fostering a culture of responsible AI use, universities can ensure equitable access, academic integrity, and data security, creating an inclusive and technology-driven learning environment.

Moving forward, the balanced integration of AI within a SMART management framework will be key to shaping resilient, learner-centered, and future-ready educational models. Universities must not only adapt to AI-driven transformations but also take an active role in shaping the ethical and strategic direction of AI in higher education. Through continuous improvement, stakeholder engagement, and interdisciplinary collaboration, institutions can build a dynamic, sustainable, and innovative higher education ecosystem that meets the demands of the 21st century.

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