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Social and communication challenges and practical cases of implementation of management information systems in higher education

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Abstract. The purpose of the study was to substantiate and provide recommendations for improving the educational activities of higher education institutions based on the use of the Microsoft Power Platform. The study used a set of general and special methods of scientific cognition, namely: the method of analysing theoretical aspects and examples of practical use of Microsoft Power Platform for creating management information systems, the descriptive method, and the method of logical presentation of findings. The paper discussed theoretical aspects and examples of practical use of Microsoft Power Platform for creating management information systems. The use of information technologies to improve the interaction between the university administration and students of education has been studied. Attention was focused on solving specific management problems and the difficulties that arise during implementation. The possibilities of using the MS Power App platform to create a convenient and effective communication channel that will facilitate the exchange of ideas and feedback were clarified. The problem of insufficient effectiveness of traditional feedback systems in higher education was analysed and ways to improve performance using modern low-code platforms were proposed. Additionally, the role of strategic partnerships between universities and technology providers was highlighted, demonstrating how collaborative efforts can enhance the implementation of management information systems and contribute to the overall efficiency and innovation within the educational sector. The results of the study confirmed the

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feasibility of introducing information technologies to improve feedback systems in higher education institutions. The proposed recommendations will contribute to improving the quality of the educational process and the effectiveness of strategic partnerships in higher education

Keywords: strategic partnership; feedback systems; automated control systems; higher education institutions; low-code; Microsoft Power Platform

Introduction

In the process of organising and implementing communication in the educational environment, certain social and communication challenges arise that affect the quality of education, interaction between participants in the educational process, and the overall effectiveness of management in higher education. The topicality of the subject matter is conditioned by the following key factors: growing demand for flexible solutions, accessibility, and ease of use, expanding automation capabilities, practical cases and real challenges, technological trends and innovations. The main aspects of concept include various psychological aspects, cultural and language barriers, ethical and legal aspects, organisational challenges, and information interaction, namely: problems of information exchange between teachers, students, administration, and the use of digital platforms to ensure effective communication. For the relationship between the university administration and students, several technologies can be used that are designed to improve their interaction, ensuring transparency and accessibility of information and reducing the time to resolve issues. This can be the use of popular platforms, such as Facebook, Telegram or Slack for quick information exchange, creating interest groups and supporting informal communication, creating interactive university websites with personalised access to information, such as news, resources, FAQ, access to the library.

I. Rodionova *et al*. (2022) noted that systems such as Moodle or Google Classroom are used to organise the learning process and provide constant feedback. A.S. Polyakova *et al*. (2023) focused on the development of specialised mobile applications that allow students to receive notifications about important events, class schedules, and assessment results.

In the modern business environment, Microsoft Power Platform provided an opportunity to quickly create and implement information management systems with minimal costs; allowed users without deep programming knowledge to develop their own solutions, which reduces dependence on IT specialists and accelerates the process of introducing new systems. This is especially relevant for the educational environment, which often does not have sufficient resources for the development of complex information systems. Power Platform can integrate various aspects of management, including workflow automation, data analytics, and integration with other enterprise systems, which helps to optimise operational processes and improve management efficiency.

In the field of implementation of information management systems in education based on Microsoft Power Platform, there are few researchers, who would deal with this topic alone. Research was conducted by several groups of researchers and individual scientists. It worth to name the main areas of their research. First, they study the general capabilities, integration with learning management systems (LMS), e-journals, and other educational tools of Microsoft Power Platform in education. The use of digital technologies in education was addressed by M. Fullan (2023), exploring the theory of "new pedagogy for deep learning".

The next area was practical cases of implementation, the experience of various educational institutions – analysis of specific examples of the use of Microsoft Power Platform for the automation of administrative processes, creation of reports, monitoring of learning results, description of scenarios, such as student data management, automation of teacher work processes, creation of analytical reports; analysis of implementation challenges and difficulties. Worthy of attention was the study by C. Callender *et al*. (2020), which was based on the results of advanced research programmes of the British Centre for Global Higher Education – the world's largest social science research centre focusing on higher education and its future.

It is worth considering issues that are in the focus of attention of Ukrainian researchers related to aspects of the use of information technologies in the education system. Among Ukrainian studies, I.M. Zabiiaka (2022) investigated the modern system of higher education in European countries, noting that, when reforming higher education in the countries of the European Community, the priorities of preserving the diversity of national education systems are taken into consideration, while simultaneously solving the tasks of international cooperation, mobility, employment of students in the European or international professional space, international competitiveness of institutions of higher education.

V.V. Kovtunets (2024), in the study "Information system of interaction of higher and professional non-higher education with the labour market", considered the configuration of platforms, integration with other systems, and compliance with data security. H.R. Henseruk & M.M. Boiko (2020), considering digital technologies as a means of improving the quality of the educational process of a higher education institution, raised the issue of improving the quality of education, and the general level of satisfaction of students and teachers.

V.M. Huzhva (2023), in the study "Frameworks of digital transformation of academic institutions", considered strategies and tools that can be used for successful digital transformation in educational institutions, focusing on the importance of information and analytical support and digital technologies during military conflicts. These studies were at the intersection of education and technology, which made them useful for analysing the implementation of Microsoft Power Platform in education.

The purpose of this study was to substantiate and propose recommendations for enhancing the educational activities of higher education institutions through the implementation of the Microsoft Power Platform.

Materials and Methods

The study used a complex of general and special methods of scientific cognition. The descriptive method and the method of logical presentation of results allowed highlighting in detail the problems of feedback, which were the basis of the functioning of management information systems and play an important role in ensuring the stability, efficiency and adaptability of these systems to permanent changes in the environment. The general scientific method of analysis allowed considering theoretical aspects and examples of practical use of Microsoft Power Platform for creating management information systems. In addition, the possibility of using the MS Power Apps platform to create a convenient and effective communication channel that facilitates the exchange of ideas and feedback was considered. The synthesis facilitated a comprehensive generalisation of the problem of insufficient efficiency inherent in conventional feedback systems within higher education institutions. This approach enabled a deeper understanding of the limitations and challenges associated with conventional methods, thereby allowing for the development of innovative solutions. As a result, the authors proposed practical and effective ways to enhance the efficiency of feedback systems by leveraging modern low-code platforms, which offer flexibility, scalability, and ease of implementation, while addressing the specific needs of higher education institutions in the digital age. The combination of these methods helped to investigate communication challenges and practical cases of implementing management information systems in higher education, in particular, the capabilities of modern tools for developing information systems and the features of using feedback in these systems. As a result of the study, substantiations and recommendations for improving the educational activities of higher education institutions based on the use of Microsoft Power Platform, which is important in the modern educational context, were provided. The importance of this research lies in its ability to provide a theoretical and practical basis for improving the educational environment, increasing the effectiveness of communications and adapting higher education to the changing conditions of the modern world.

Results and Discussion

Feedback is the basis of the functioning of management information systems and plays an important role in ensuring the stability, efficiency and adaptability of these systems to permanent changes in the environment. Therefore, it can be considered a key element that determines the successful functioning of management systems. The input signal of the system determines the desired value of the output parameter, and its actual value is measured at the output. The difference between the desired and actual values is an error that requires a management decision to be made to adjust the state of the management object. For this, a control signal is generated. The control object responds to it by changing the input value to achieve the desired result. One of the key components of the management information system is people, and feedback becomes an important element of interaction between them, especially in a professional environment. Its importance lies not only in providing useful information, but also in stimulating development and positive change. Objective data on employee performance, behaviour, and contribution to the overall success of the organisation creates conditions for learning, professional growth, and skill improvement. This helps employees to feel recognised and their own importance for the company. Based on feedback, employees have a clear understanding of their roles, expectations, and areas for further development.

The main types of feedback in human interaction are: formal, informal, feedback from colleagues and 360-degree feedback. Formal feedback includes structured processes within the organisation, including annual evaluations and goal setting and appraisal sessions. It is carried out according to the established schedule; it contains a documented assessment of employee performance in accordance with defined goals and competencies. This approach allows fully assessing an employee's strengths, identifying areas for improvement, and formulating development goals, which is the basis for managing efficiency and career development.

Informal feedback is less official, occurring spontaneously in everyday interactions between managers, colleagues, and the team. It can be casual conversations, quick check-ins, or task supervision. This feedback is often timely and contextually accurate, addressing current issues or recognising achievements in real time. Although it lacks formality, informal feedback is effective in reinforcing positive behaviours, correcting mistakes, and building team cohesion.

Peer feedback is an exchange of ideas between colleagues or team members that creates new aspects of work perspectives from people, who know its specifics well. It encourages collaboration, mutual learning, and accountability within the team, as employees receive

useful ideas and perspectives from colleagues that complement feedback from management. 360-degree feedback, or multi-way feedback, encompasses feedback from a variety of sources, including managers, peers, subordinates, and sometimes even external stakeholders. Such a comprehensive approach provided a holistic vision of work results, covering different perspectives. 360-degree feedback promoted reflexive (reflective) awareness, identification of "blind spots", and the development of a culture of accountability and shared responsibility. Careful planning, confidentiality and trust between participants are important for its effectiveness.

Effective feedback is a key component of successful management and an important element of the development of organisational culture. Selectivity, clarity, and timeliness of feedback stimulate employees to self-development and increase productivity. In addition, the regular practice of constructive feedback contributed to the improvement of team effectiveness and the achievement of common goals. The importance of feedback for development, improvement and effective communication were confirmed by the statements of famous people:

- Bill Gates frequently talked about the need for constant self-improvement: "We all need people, who will give us feedback. That's how we improve" (Johnson, 2020);
- "Feedback is the Breakfast of Champions", – is a quote from Rick Tate (Blanchard, 2015).

Among the key aspects, where feedback contributed to increasing the efficiency and adaptability of management systems, the following can be identified:

- constant monitoring of the state of objects and activity results allows management to monitor the implementation of plans, identify deviations from standards and take corrective measures in a timely manner;
- timely received information provides managers with objective data for decision-making, helps to determine priority areas of development, optimise resources, and increase the organisation's competitiveness;
- feedback and suggestions of employees ensure an open and trusting atmosphere in the team, increase motivation, staff involvement and contribute to the development of corporate culture;
- feedback from customers motivates enterprises to quickly respond to changes in consumer demand and preferences, helps to identify shortcomings of products and services, improve their characteristics, and ensure high quality of service.

Based on this, organisations can quickly identify bottlenecks and inefficiencies in the organisation's internal processes, change strategies and tactics to maintain their competitiveness, implement innovative approaches, optimise work procedures and increase overall productivity (Anisimova & Prihunov, 2020).

It is worth noting that the development of feedback requires information about the results of the system, the quality of which depends on correctly selected methods of data collection and analysis. The choice of information collection method determined by the nature of the system itself, its functionality, volume, and complexity. For example, large industrial systems may require the use of extensive networks of sensors and specialised monitoring systems. The availability of technologies, sensors, software, and equipment may impose certain limitations. The choice of method is also greatly influenced by the type of data to be collected, analysed, and used. For example, thermometers are required to measure the temperature; special sensors may be required to measure vibration. An equally important factor can be the cost of equipment, maintenance and support of the system. The system may require high accuracy, real-time measurement, system security and reliability requirements. Therefore, the choice of the method of information collection should consider all these factors. For example, if a higher education institution uses a data analysis system on the success of students in order to improve the quality of education and increase the effectiveness of the curricula, the use of an electronic journal and scoring system will provide the system with the necessary data accuracy and reliability. This will determine, how accurate and reliable the data on the success of the applicants will be and will be the basis for analysing their academic performance and identifying weaknesses. Thus, the accuracy and reliability of the data collected by the system will determine the success of the analytical processes and the effectiveness of the adopted educational decisions. For example, if a higher education institution used a data analysis system on the success of students in order to improve the quality of education, then the implementation of an electronic journal and evaluation system will provide the system with the necessary accuracy and reliability of data. This, in turn, will become the basis for analysing the academic performance of students and identifying weak points. If a student performance data analysis system can receive data about their academic progress in real time, the administration can quickly identify low achievers or those, who need additional support and immediately provide them with the necessary help or resources to adjust the individual learning trajectory.

In libraries, these factors can be critical, when implementing systems for accounting and control of the preservation of publications, especially rare or valuable publications. For example, if a system used the requirements for high accuracy, real-time measurement, security and reliability of identification (RFID) to track rare books, the method of collecting information must meet the requirements of high accuracy (to avoid errors in the location of books), work in real time (to immediately detect cases of unauthorised movement), ensure a high level of security (protection against theft) and reliability of the system (stable operation without failures).

The collection of information in real time becomes a key element for the effective management of the educational process and the achievement of high-quality standards of higher education. Figure 1 presented examples of feedback systems in management systems for various purposes.

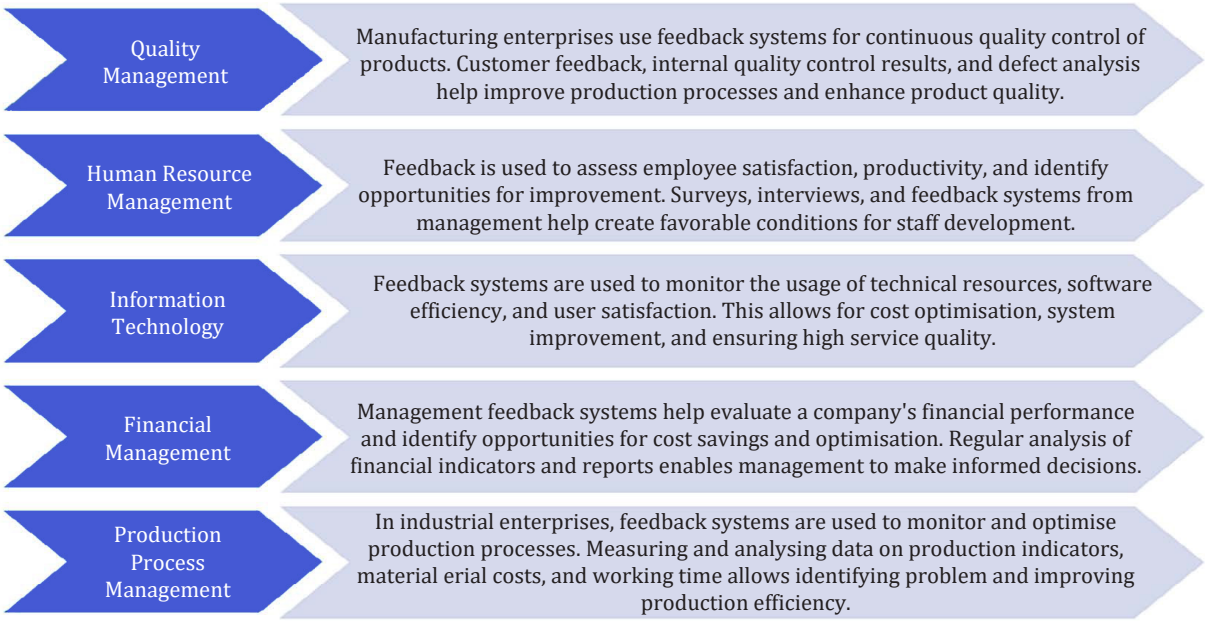

Figure 1. Examples of feedback systems in management systems for various purposes
Source: developed by the authors

The wrong choice of data collection methods can lead to unnecessary costs and cause significant financial losses. Notably, a higher education institution, in order to improve the educational process, implements a system of data analysis on the success of students, which requires significant capital investments for the purchase, setting up of specialised equipment and training of personnel. However, during operation, it turns out that the system does not provide the required accuracy and speed of data collection. Due to low efficiency, there is a need for additional investments in the elimination of shortcomings, modernisation or even a complete replacement of the system. This leads to unnecessary spending of money, time, and effort, which could be directed to other, more useful initiatives for the development and improvement of the educational process. Therefore, it is important to have a good understanding of the needs and characteristics of a particular system, as well as the advantages and disadvantages of different information collection methods, in order to make the optimal choice that will support the efficient operation of the system.

Next, the study considers the concept of "management information system" in more detail. To do this, a definition and analysis of the essence of the following components will be provided: information, information system and management. The Ukrainian Library Encyclopedia (2024) contained the following definition of the concept of "information" (from the Latin *informatio* – explanation; statement of facts, events; presentation, concept; familiarisation, education) – in general interpretation – recorded in document form or publicly announced information about events and phenomena in society, the state, the environment, which a person perceives directly with the help of their own senses or special devices as a reflection of the facts of the material or spiritual world in the process of using various communication channels, including mass media, text, verbal messages; interaction with nature is also a source of information. The Economic dictionary (2024) interpreted the term "information" as a set of information, data, knowledge about the object or phenomenon being studied. In management theory – a set of information about changes occurring in the system and the environment of this system, which reduced the level of uncertainty of knowledge about the course of the management process; subject, means and product of managerial work. The Law of Ukraine No. 2657-XII (2024) defined this concept as any information and/or data that can be stored on physical media or displayed in electronic form. Therefore, the definition of the term "information" may vary depending on the context and scope of application: in informatics, it is a set of data that can be stored, processed and transmitted by computer systems; in information theory – a measure of uncertainty that decreases as a result of receiving a message; philosophy sees it as knowledge that is transmitted between subjects; biology is like a genetic code stored in DNA that determined the characteristics of an organism. In economics, information is transmitted

through data about markets, products, and consumers, which were used to make economic decisions. For management, it is data that is processed and used to support management decisions. A general definition of information can be as follows: information is data that has meaning or utility to a particular user or system in a particular sense. Information is transmitted, stored, processed and used to make decisions, communicate, or perform certain tasks. The concept of "information system" also varies depending on the context and field of application. DSTU 7448:2013 (2014) interpreted the concept of "information system" as follows: a communication system that provided collection, information search, processing, transmission and storage of information. The Economic dictionary (2024) immediately interpreted this concept in the context of managerial activity as a process of collecting and processing information to support planning, decision-making, coordination, and control at the enterprise. The information system included people, structure (construction, form), methods, technical means, removal, transformation, data transmission, information carriers, and data processing schemes. The main functions of the management information system: collection, storage, accumulation, search and transmission of data used to support decision-making. The interpretation of the Economic dictionary (2024) determined the components of the management information system and its purpose: support for planning, decision-making, coordination and control at the enterprise. Notably, the information system can exist without the use of computer equipment, that is, technical means are an optional component. Historically, many information systems were created and operated long before the advent of computers. Libraries used card catalogues to organise and find books. This system was efficient and allowed quickly finding the necessary information. Government institutions, companies, and other organisations kept paper documents in special archives. Various classifiers and indexes were used to organise these documents. Paper telephone directories were used to find contact information. Financial transactions were recorded in special journals and books. Therefore, it is necessary to distinguish between the concepts of "Management information system" and "Industrial control system (ICS)" (Fig. 2).

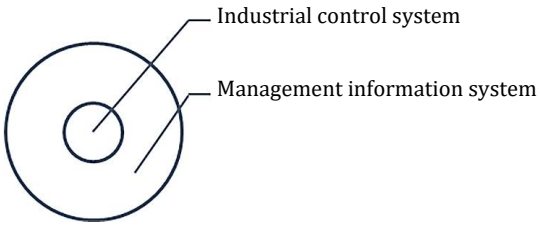

Figure 2. Correlation of the concepts "Management information system" and "Industrial control system"
Source: developed by the authors

Next, the study considers the concept of "management". According to the definition of the terminological dictionary, management is the process of organising purposeful action on an object (system), as a result of which it moved to the desired target state (Glossary of terms, 2024). A vivid example of managerial activity is the issuance by the rector of the university of an order to change the form of education from face-to-face to distance education in connection with the quarantine. Figure 3 showed the stages of the organisation process and management actions that can be included in such an order. An example of managerial activity aimed at improving the availability of library services and the efficiency of work through the introduction of new technologies in the library of a higher education institution can be innovative projects and automation of processes – the introduction of automated systems for cataloging funds, the development of a mobile application for accessing library resources, the development of a chatbot for responses to user requests, digitisation of archival materials.

Thus, control means the process of observing the system and creating control actions (influences) that direct the system to the target state. Such impacts can be created both by a person (or a group of people) and by technical means. An important participant in the management process is the observer, who becomes a control system or a control subject, while the object of observation turns into a controlled system or control object. The control system includes the union of the controlling and controlled systems. This process can have different scales and complexity, from simple mechanical systems to complex organisational structures. Effective management requires a clear understanding of goals, means of achieving them, and constant monitoring and correction of actions in response to changes in the external environment. Due to modern technologies, management processes can be significantly automated, which increases their accuracy and efficiency. Automated information systems can analyse large volumes of data in real time, make optimal decisions, and take necessary corrective actions with minimal human intervention. Thus, the main functions of management information systems include the collection, storage, processing, and analysis of data, support of the management decision-making process, automation of routine operations, and provision of access to information at various levels of the organisation. Management information systems widely used in production, finance, logistics, trade, education, and other industries, helping organisations to optimise operations, increase resource efficiency, and make informed management decisions. Although such systems can function without computer equipment, but in the era of digital transformation, modern technologies have significantly increased their efficiency, speed and accuracy of information processing. However, the issue of finding appropriate economically justified solutions remains relevant (Fig. 3).

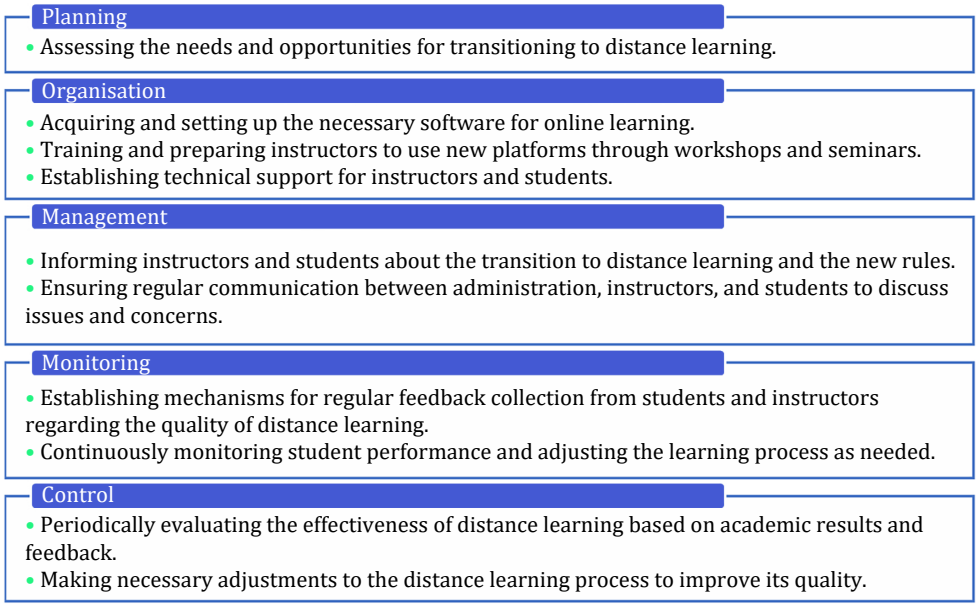

Figure 3. Stages of the organisational process and management actions
Source: developed by the authors

The digitalisation process in the globalised digital world is one of the leading trends of modernity, which permeates existing processes, qualitatively improving them, and creates new services. Digitisation is based on the introduction of new information and digital technologies and is a mechanism for the formation of an information society. Digital transformation means not only the transition to electronic technologies, but also the rethinking of business processes and strategies in a digital environment. One of the key aspects of this transformation is the growing number of technical specialists known as "citizen developers". Citizen developers are non-professional developers, who create applications and automated processes using low-code or no-code platforms. These platforms provide a user interface and tools that allow creating applications without the need for deep programming knowledge. The main difference between such developers and traditional developers is their professional field and skills: traditional developers usually have a high level of technical training and specialise in software development. However, citizen developers can be employees of various departments of the company, not necessarily related to IT, such as business analysts, project managers or operational specialists. They understand business processes and user needs, which allows them to effectively create applications that meet the specific needs of the company.

The first low-code/no-code platforms appeared in the 2000s, such as OutSystems (in 2001) and Mendix (in 2005). These platforms allowed non-programmers to create simple applications. In addition, Microsoft Excel, although it existed since the 1980s, in the 2000s gained considerable popularity as a tool for automating simple business processes using formulas and developing macros using the built-in programming language VBA (Visual Basic for Application), becoming a prototype tool for citizen developers. In the mid-2000s, Gartner first introduced the term "citizen developers" to described "non-specialists", who created applications to solve business problems using new technologies: "citizen developers are workers, who create functional applications for use by themselves or other employees using tools that are not prohibited by IT or other business units. Citizen developers is a personal characteristic, not a title or a targeted role. Such employees report to a structural or functional division other than IT. All citizen developers are business technologists. However, business technologists are not necessarily citizen developers. There is no mandatory qualification or time allocation for citizen developers, but they must be official employees of the organisation". Therefore, citizen developers can be employees of any department of the organisation, and not necessarily IT specialists. This definition focused on the individual, who possesses the ability to develop programmes, rather than a specific position or role in the organisation. The fundamental importance of community developers is that they democratise the software development process, making it accessible to a wide range of users. Based on this, companies can respond more quickly and efficiently to changes in the business environment and create innovative solutions without having to depend on a limited number of professional developers. In the 2010s, there was an expansion of opportunities in the field of low-code/no-code platforms due to the appearance of more powerful and functional tools that significantly simplified the process of creating software solutions for users. Microsoft Power Apps, released in 2015, became

one of the key platforms that enabled users to create applications without deep programming knowledge. Due to intuitive interfaces, Power Apps allowed even non-engineers to create functional applications for various fields of activity, from production management to internal communication. Microsoft Power Apps was presented as a unique solution to solve three problems identified by Microsoft's customers (Fig. 4).

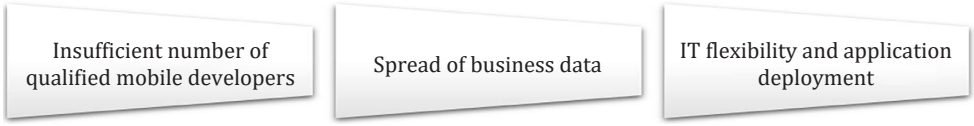

Figure 4. Issues that the Microsoft Power Apps platform helps to solve
Source: developed by the authors

The demand for mobile application development services was growing rapidly, resulting in a shortage of skilled developers to meet business needs. Business data is increasingly being stored outside of local corporate networks with SaaS cloud services. Storing data in multiple systems makes it difficult to connect to them and use related data within a single application. Distribution of mobile applications is usually done through app stores or mobile device management, which should be controlled by IT staff. This created certain difficulties, when installing applications on personal devices of employees (Microsoft Power Apps…, 2024). In addition, during this period, the American company "Salesforce" launched its Lightning platform, which offered an approach to creating software solutions for customer relationship management (CRM). Lightning provided the ability to create advanced CRM systems without the use of software code, allowing companies to effectively interact with customers and optimise their business processes (Zola & Wigmore, 2022). These platforms have opened up new opportunities for business, helping to accelerate the development of applications and reduce the costs of IT projects. Their appearance contributed to the development of interest in the concept of citizen developers and the expansion of the circle of people, who could participate in the digital transformation of enterprises.

The COVID-19 pandemic has accelerated digital transformation, increasing demand for tools for remote work and business process automation. Companies began to invest more in low-code/no-code platforms for rapid implementation of technology solutions. New platforms, like AppSheet (acquired by Google in 2020), have emerged to make application development even more accessible. Table 1 showed several concrete examples of the application of the concept of "citizen developers" for the automation of business processes, data analysis, internal communication, and the development of full-featured applications for small and medium-sized businesses.

Table 1. Examples of the introduction of the concept of "citizen developers" in various areas of business

The field of business	Example
Employee of the financial department	Automation of processing internal costs or payments
Production managers	Inventory monitoring or production planning
Marketers	Creation of dashboards to analyse the effectiveness of advertising campaigns or collect customer data
Specialists in logistics	Creation of reports to monitor transport routes or optimise the supply chain
HR managers	Development of applications for managing the hiring process or a system for organising corporate events
IT employees	Creation of internal tools to monitor network health or manage technical support
Small business owners	Creation of applications for online booking or e-shop without the need to hire a programmer
Service providers	Creation of mobile applications for customer support or for organising work schedules

Source: developed by the author

These examples showed a wide range of opportunities that are opened by the involvement of citizen developers in various areas of business. Thus, citizen developers" is a term coined by Gartner in the mid-2000s to describe non-technical workers, who create oftware solutions to solve business problems. Such developers are a separate group of professionals, who play an important role in business transformation. They implement digital solutions, automate business processes without deep knowledge of programming. The fundamental importance of community developers is that they democratise the software development process, making it accessible to a wide range of users. Based on this, companies can respond more quickly and

efficiently to changes in the business environment and create innovative solutions without having to depend on a limited number of professional developers.

Development on low-code and no-code platforms provided many advantages that make them attractive to organisations and developers, such as rapid prototyping, reduced development costs, accelerated changes, ease of use, integration with external systems, automation of business processes, standardisation through templates, effective data management, reliable access and security management, and powerful analytical tools: rapid prototyping and testing of ideas, reduced development costs, accelerated development and changes, ease of use, integration with external systems, business automation processes, templates and standardisation, data management, access and security management, analytics and data visualisation. These capabilities allow organisations to significantly accelerate digital transformation, reduce software development and maintenance costs, increase productivity and flexibility of their business processes, involving non-technical users in development and reducing dependence on highly skilled programmers. Although low-code platforms have numerous advantages, they also have some limitations and disadvantages, including: limited flexibility and opportunities for developers compared to traditional programming, limitations in functionality or the ability to integrate with complex or unique systems, limitations in the choice of tools and resources for solving complex tasks, lack of full control over the created systems. The described capabilities make the low-code platform a powerful tool for managing communications and improving the efficiency of business processes. It is worth using low-code and no-code platforms in cases, where development speed, cost reduction and acceleration of digital transformation are important priorities for the organisation. They can be particularly useful for prototyping, developing fast-moving or experimental projects, and for ensuring that a wider range of employees are involved in the development process. However, there are limitations of these platforms in terms of flexibility and integration capabilities, so it is important to do a thorough analysis of compliance with project requirements before using them.

According to the legislation of Ukraine, the activity of a higher education institution covered a wide range of areas, including scientific, scientific and technical, organisational, innovative, and methodical spheres. Scientific activity consists in conducting research in various fields of knowledge with the aim of creating new knowledge and developing science. It contains both fundamental and applied research aimed at solving current problems of modern time. Scientific and technical activity are aimed at carrying out scientific research with the aim of solving specific technical tasks and developing new technologies. This field is responsible for both theoretical research and practical developments that contribute to technological progress. Organisational activity covers the effective management of all aspects of the life of the institution, including administrative, financial, and organisational support. It concerns the development of strategic plans, the implementation of various management practices and ensuring the efficient use of resources. Innovative activity is responsible for introducing new ideas, methods, technologies and approaches into the educational process and research work. This area promotes the development of creativity and innovative thinking among students and teachers and stimulated the development of innovative projects and initiatives. Methodological activity involves the development and implementation of methods, educational programmes, textbooks and other educational materials to ensure quality education and development of students. The field is important for ensuring the high quality of education and developing the competencies of participants in the educational process. But all these aspects were aimed at organising an effective educational process for the development of interested persons, considering their individual needs, vocations, interests and abilities. This approach allowed institutions of higher education to provide high quality education and meet the modern requirements of society.

In the activity of a higher education institution, systematicity is extremely important – all aspects of the institution's work must be interconnected and complement each other to achieve a common goal – the provision of quality education and the development of students. For example, scientific activity can serve as a basis for the development of new teaching methods, which are then used in the educational process. Organisational efforts are aimed at ensuring the effective functioning of all departments of the institution so that they can effectively support educational and scientific initiatives. Innovative activities contributed to the introduction of innovative approaches to teaching and research. Methodical work, in turn, helps in adapting these innovations to the specific conditions and needs of the acquirers. This approach allows creating a complete system of management of educational activities, which contributes to the qualitative growth and development of all participants in the educational process. Only based on a systemic approach, a higher education institution can effectively meet the challenges of the modern world and ensure the deep and sustainable development of its students.

One of the subsystems of the educational activity management system of the higher education institution is the education quality system, which includes aspects aimed at ensuring the quality and efficiency of the educational process (Fig. 5). Quality standards and policies are a set of rules, standards, and procedures that define expected educational outcomes, including methods for measuring them and ensuring quality. They

can be defined by international organisations, national government bodies or the institution itself. Monitoring and evaluation include the processes of collecting, analysing, and evaluating data on the quality of education, student performance, graduates and their further careers, as well as information on the satisfaction of the educational process by its participants. Planning and strategic management includes the development of strategies and goals for improving the quality of education, and the planning of specific actions to achieve these goals. The support and development of the teaching staff includes elements of helping the teacher in their work: training, trainings, methodical support, and motivational programmes.

Figure 1. Components of ensuring the quality and effectiveness of the educational process
Source: developed by the authors

An important component of the quality of the educational process is the involvement of the student and teaching community in the management of the institution. Students and teachers best understand their own needs and expectations. Their involvement in the planning and management processes allows the higher education institution to adapt programmes and services to the real needs of the educational environment. Active participation of students and teachers in management processes can help identify problems and form useful proposals for improving the quality of education: new ideas, teaching methods or comments on existing practices. The efficiency, speed, and accuracy of the implementation of management initiatives are provided by information technology, with the help of which mechanisms can be implemented to receive feedback and suggestions from students, graduates, teachers, and other interested parties regarding the quality of education and possible improvements. But teachers and administrative staff may not have sufficient knowledge and skills to automate existing processes and effectively use feedback systems. Even if a facility has a modern system for collecting feedback, its effectiveness will be reduced if staff do not understand how to use it or are not motivated to use it. This may require additional training and support from the administration. The solution to this problem can be the use of citizen developers' technology.

For educational institutions, Microsoft has developed a special programme "Microsoft 365 Education", which offers a set of targeted solutions on preferential terms, aimed at creating an environment with equal learning conditions for all students and "promoting their success in the classroom and beyond". Universities can obtain free licenses for Microsoft software for the education of students and staff. The programme provided access to educational resources that help teachers and learners effectively use Microsoft technologies in the educational process. The programme provided access to Microsoft cloud services, such as OneDrive, Office 365 and SharePoint, for data storage and sharing (Transform the learning experience…, 2024).

The preferential conditions created help universities to effectively use Microsoft technologies for teaching and research. Therefore, the line of low-code Microsoft Power Platform products looks promising for the implementation of management solutions. It consists of four main components and provides a variety of tools and capabilities to create and manage applications, reports, dashboards, and chatbots without the need for deep programming. For example, Power BI is designed to analyse data and create interactive reports and dashboards. It allows visualising and understanding data using a variety of graphs and charts. Power Apps allows building custom applicatins for multiple platforms, including mobile and web. Power Automate allows automatinh business processes and workflows. Power Virtual Agents allows creating interactive chatbots for various scenarios of interaction with customers or employees.

Microsoft Chief Executive Officer Satya Nadella said, "Power Platform has become the leading platform for automating business processes and improving productivity for experts in every industry. Power Platform revenue exceeded USD 2 billion in the last twelve months, up 72% year-over-year" (Microsoft Power Platform…, 2023). Ryan Cunningham, Vice President of Power Apps noted that Microsoft Power Apps was used by more than 25 million users every month, with a growing number of these applications being developed by teams of professionals (Microsoft Fiscal Year 2024, 2023).

Therefore, the information management system of the higher education institution can be improved due to the introduction of citizen developer's technologies into the management system of educational activities. An economically feasible solution for this can be Microsoft Power Platform, which is usually already

used in higher education institutions in the educational process for using Microsoft Office 365 office applications, that is, it does not require additional significant financial costs for purchase and deployment. This will help to attract effective feedback from all participants of the educational process and increase the efficiency of the higher education institution.

I. Bondar (2022) emphasised that information potential is an important resource for creating new products and meeting the needs of modern users. As stated by H. Lukash *et al*. (2023), the search engine constantly scans Internet resources, collecting information about the content of web pages, indexing and filling databases. This process included text analysis and determining keywords that correspond to the content of the published information. L.P. Trebyk (2016) emphasised the mass use of information and communication technologies in education, in particular electronic textbooks, training programmes and methodical materials. O. Luchaninova (2022) noted that leading world trends are distance education and scalable digital universities, which contribute to expanding access to education.

M.L. Rostoka (2023) analysed effective digital transformation methodologies, such as transdisciplinary and synergistic approaches. U. Kiriyenko (2023a) emphasised the importance of systematising the social effects of digitalisation to reduce its negative consequences. Additionally, U. Kiriyenko (2023b) explored massive open online courses and the information management system "Electronic university". T. Pantiyuk *et al*. (2020) noted that innovations in education should be aimed at ensuring the guaranteed achievement of educational process goals and providing predictable outcomes. O. Prihunov (2020) emphasised that stakeholders are the main influencing factor on the educational process in the modern educational environment of Ukraine, as they set the requirements for ensuring a quality educational process.

P. Saukh (2020) noted that the state and significance of higher education are indicators of the development of the state. O.V. Strutynska & M.A. Umryk (2020) argued that a modern specialist must be able to effectively use digital technologies to achieve common goals. It is also important that modern literature examined in detail services for assessing the effectiveness of scientific and pedagogical activities (Ivanova *et al*., 2022). The information potential and digital technologies play a crucial role in modern education, resource management, and the creation of new products. Key trends included the widespread use of distance education, scalable digital platforms, and effective digital transformation methodologies to meet societal and professional needs. Additionally, the importance of evaluating the social effects of digitalisation and assessing the effectiveness of scientific and pedagogical activities is increasingly emphasised in contemporary research.

Conclusions

The study highlighted the theoretical aspects of feedback systems, identified the unique features of utilising feedback in management information systems, explored the potential of modern tools for developing such systems, and provided substantiated recommendations for enhancing feedback mechanisms in higher education institutions. The results obtained testify to the achievement of the research goal and allow drawing the conclusions. It has been established that feedback is a critically important element of management systems that ensures their efficiency, adaptability, and sustainable development. It is the key to continuous improvement of the activities of organisations, in particular, higher education institutions. Modern methods of information collection and analysis are required for the effective implementation of feedback, which ensure openness, compatibility and efficiency of data exchange. In particular, management information systems integrated with feedback systems contribute to the optimisation of management processes, increasing the efficiency of resource use, and making informed decisions.

The role of information technologies "citizen developers" in the process of democratisation of software development, which makes it accessible to a wide range of users, was considered. The possibilities of low-code and no-code platforms, which allow rapid development and implementation of information systems without the need for in-depth knowledge of programming, have been analysed. The use of Microsoft Power Platform products was proposed as a cost-effective solution for improving the feedback system in higher education institutions.

Thus, the results of the study confirmed the expediency of implementing information technologies to improve feedback systems in higher education institutions. The proposed recommendations will contribute to the improvement of the quality of the educational process and the efficiency of higher education institutions.

Further research on the topic includes analysing the impact of information systems on communication between students, teachers, and administration. It is important to develop strategies for integrating digital platforms into the educational process and management of educational institutions. Key areas include research into cyber security, data ethics, and user adaptation to new technologies. Assessment of the effectiveness of implemented solutions, study of international experience, and overcoming barriers to digital transformation are promising.

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Conflict of Interest

None.

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Соціальні та комунікаційні проблеми та практичні кейси впровадження інформаційних систем управління у вищій школі

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Анотація. Метою дослідження було обґрунтування та надання рекомендацій щодо вдосконалення освітньої діяльності закладів вищої освіти на основі використання платформи Microsoft Power Platform. У дослідженні було застосовано комплекс загальних і спеціальних методів наукового пізнання, а саме: метод аналізу теоретичних аспектів і прикладів практичного використання Microsoft Power Platform для створення інформаційних систем управління, описовий метод і метод логічного викладу результатів. У роботі було розглянуто теоретичні аспекти і приклади практичного використання Microsoft Power Platform для створення інформаційних систем управління. Досліджено використання інформаційних технологій для покращення взаємодії між адміністрацією університету та здобувачами освіти. Увагу було зосереджено на вирішенні конкретних управлінських завдань та труднощах, які виникають під час впровадження. Уточнено можливості використання платформи MS Power App для створення зручного та ефективного каналу комунікації, який сприятиме обміну ідеями та зворотним зв'язком. Проаналізовано проблему недостатньої ефективності традиційних систем зворотного зв'язку у закладах вищої освіти та запропоновано шляхи покращення їхньої роботи за допомогою сучасних платформ low-code. Крім того, акцентовано увагу на ролі стратегічного партнерства між університетами та постачальниками технологій, що продемонструвало, як спільні зусилля можуть сприяти впровадженню інформаційних систем управління і покращувати загальну ефективність та інноваційність в освітньому секторі. Результати дослідження підтвердили доцільність впровадження інформаційних технологій для вдосконалення систем зворотного зв'язку у закладах вищої освіти. Запропоновані рекомендації сприятимуть покращенню якості освітнього процесу та ефективності стратегічного партнерства у сфері вищої освіти

Ключові слова: стратегічне партнерство; системи зворотного зв'язку; автоматизовані системи управління; заклади вищої освіти; low-code; Microsoft Power Platform