Best Practices in Teaching Digitization and Process Automation - A Case Study of Warsaw University of Technology

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Abstract. This article examines recent advancements in the use of Artificial Intelligence (AI) for automation and robotics, highlighting efficiency gains across sectors. It reviews key trends, including robotic process automation in different areas and compares AI implementation frameworks such as MLOps and DevOps. The study presents educational approaches to teaching automation at Warsaw University of Technology, detailing project structures, tools and practical outcomes. Quantitative results on time savings are discussed in relation to existing research. The paper concludes with insights on incorporating AI into education to better prepare students for the digital future.

Keywords: : Low/Zero-Code platforms; Warsaw University of Technology; MLOps and DevOps; digitization; automation.

1 Introduction

The rapid advancement of automation technologies and Artificial Intelligence (AI) has fundamentally transformed various industries, streamlining processes and increasing operational efficiency. The integration of AI into process automation has enabled businesses to optimize workflows, reduce human intervention, and enhance accuracy across a range of applications, from manufacturing to financial services. The growing reliance on AI-driven automation has raised critical questions about how these technologies should be studied in academic settings to prepare future professionals for the evolving digital landscape.

This study explores best practices in teaching digitization and process automation, with a particular focus on the educational methodologies, which are in-use at

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Warsaw University of Technology. By comparing Low/Zero-Code platforms with traditional programming methods, the study aims to assess the effectiveness of different teaching approaches in equipping students with the necessary skills for AI-driven automation. As organizations increasingly adopt AI-based solutions, there is a growing demand for professionals who can efficiently implement and manage automation tools. Understanding the most effective ways to teach these skills is essential for shaping the workforce of the future.

A central objective of this study is to evaluate the effectiveness of Low/Zero-Code platforms compared to traditional programming in teaching automation and digitization. Low-Code platforms offer a visual, user-friendly interface that enables rapid application development with minimal coding expertise, making them highly accessible for non-programmers. Conversely, traditional programming methods require in-depth coding knowledge and offer greater flexibility in developing complex automation solutions. Understanding the trade-offs between these approaches is crucial for designing effective educational curricula.

This research provides an in-depth case study of Warsaw University of Technology's approach to teaching digitization and process automation. The curriculum incorporates various automation frameworks, including DevOps and MLOps, to give students a comprehensive understanding of AI-driven automation. The study outlines project structures, tools used, and practical implementations, including screenshots of student-developed automation workflows. By analyzing real-world applications of AI in automation education, the research offers valuable insights into best practices for integrating these technologies into academic programs. Moreover, the study highlights the importance of standardization and best practices in automation education. Beyond merely replacing human labor, automation involves optimizing workflows, implementing templates, and ensuring interoperability between different systems. By leveraging AI and automation frameworks, educational institutions can equip students with the competencies required for the digital age.

2 Literature review

Previous studies have demonstrated that Low-Code platforms significantly reduce development time compared to traditional programming [1]. Our research builds on these findings by quantifying the time saved in learning automation concepts through Low-Code tools versus conventional coding methods. Preliminary results suggest that Low-Code learning is 232% faster than traditional programming, facilitating quicker upskilling and adoption of automation technologies. However, despite these advantages, we assume that Low/Zero Code approaches still require supplementation with traditional programming for more advanced and customized automation solutions.

Despite these advancements, a major challenge remains the effective training of professionals who can develop, manage, and optimize AI-driven automation tools. Research by KPMG indicates that only 51% of companies provide adequate training in automation technologies, leading to inefficiencies and suboptimal utilization of AI capabilities [2]. This gap underscores the importance of educational programs that offer

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practical, hands-on training in process automation, preparing students to meet industry demands. AI-powered automation has been widely adopted across industries, particularly in fields such as healthcare, finance, and logistics, where machine learning (ML) models and robotic process automation (RPA) systems play a crucial role. Notably, methodologies like DevOps and MLOps have emerged as key frameworks for managing the lifecycle of AI-based automation solutions. Companies such as Mayo Clinic successfully integrate DevOps and MLOps principles to enhance AI-driven decision-making, demonstrating the impact of structured automation practices on organizational efficiency [3].

Using Low-Code platforms, process automation and robotization enables the rapid creation of efficient and scalable solutions [4]. Low-code programming (LCP) is an approach to software development that minimizes the need for manual coding by using visual tools, abstraction models, and methods of programming by examples and natural language programming (NLP). The faster pace of application delivery using Low-Code platforms is confirmed by research. Software development using Low-Code is approximately three times faster than using traditional coding methods [1]. Research conducted by Richardson and Rymer [5] showed that Low-Code development platforms can help accelerate enterprise development and application delivery by 5 to 10 times. An important aspect, which became actual the past few years, is also AI-driven tools usage to generate applications, analyze data, generate workflows and generate some recommendations for user [7]. Companies that use a structured approach to tool selection achieve 65% higher implementation efficiency [13]. For example, Milky Way model [20], which is an approach to analyzing and visualizing the entire organization on one page, presents the relationships between business processes, applications in a holistic and easy-to-understand way.

Rapid application development is not the only benefit of implementing Low-Code platforms. Other benefits include enhanced scalability, reduced dependency on highly specialized developers, and improved adaptability to business needs.

3 Methods and Methodology

Methods

In this study, we analyze the effectiveness of teaching digitalization by comparing two approaches: Low/Zero Code platforms and traditional programming. First, we are going to describing how we are teaching digitalization at Warsaw University of Technology based on our 6 years of experience. We will present best practices, show what applications we use, discuss the team work methods we teach, present analytical models used to collect requirements for digitalization, sample diagrams, discuss the method used to automate processes and tasks, and show how we do it using an example. Then, we will define the learning outcomes and education time and compare them to the education of programmers using classic languages such as Python.

Modern organizations must adapt to dynamic changes in the business environment, and digital transformation has become a key element of company development strategies. Digitization of operational processes allows companies to streamline operations,

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reduce costs and increase flexibility. According to OutSystems research [6], companies can be divided into six levels of digital maturity:

1. Unaware - 5% of companies, no digitalization activities;
2. Isolated initiatives - 19%, first experiments with digitalization;
3. Widespread digitalization - 17%, implementation of technologies in selected areas;
4. Strategic digitalization - 31%, digital solutions key to business;
5. Integrated digitalization - 10%, full integration of IT systems;
6. Continuous innovation - 18%, digital companies, constantly implementing new technologies.

The aim of the digitization project is not to create an application, but to provide a solution that provides the organization with greater efficiency through process automation and better data availability, providing better customer experience and improving cooperation between teams, which ultimately leads to increased competitiveness and innovation of the company. This is achieving digital maturity level 4, 5, 6.

Over 6 years of conducting classes on enterprise digitization, acquiring new knowledge and experience, the best practices used at the Warsaw University of Technology in teaching enterprise digitization have been developed and listed below:

- Combining application development methods and team work management (MLOps, DevOps);
- Using enterprise architecture for a comprehensive analysis of process digitization needs;
- Using Low-Code platforms, process automation and robotization to quickly create efficient and scalable solutions [4];
- Using Artificial Intelligence algorithms to generate applications, analyze data, generate workflows, generate recommendations for users and register data [7]. According to KPMG, 88% of managers believe that the integration of AI with Low-Code has huge potential [2];
- Replacing human work with the automation of processes and tasks.

According OutSystems research, 65% of enterprises need to implement at least 10 applications, and 23% need to implement more than 50 applications. Companies need to implement 58% of these applications within 3-4 months and another 23% within 5-6 months. Such a fast pace of application delivery is possible using Low-code platforms [6].

Methodology

Low-code programming (LCP) is an approach to software development that minimizes the need for manual coding by using visual tools, abstraction models, and methods of programming by examples and natural language programming (NLP). Low-Code supports digital transformation, helping to quickly reach the levels 4, 5, 6 of digital maturity.

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Analysis of 24 Low/Zero-code platforms identified those that incorporate AI technology into application generation, data analysis, workflow generation, user recommendation generation, and data logging [1;9;10;11;12]. A list of platforms implementing AI in at least two areas, and extends them with qualifications according to the Gartner report, is presented in Table 1 [9]. The table is based on the analysis mentioned above.

Table 1. Comparison of Low-Code Platforms

Low-code tools	Generate Apps	Data Analysis	Generate Workflow/code	Recommendations	Gartner matrix
Quickbase	✓			✓	Niche players
OutSystems	✓	✓	✓	✓	Leaders
Power Apps	✓		✓	✓	Leaders
Appian		✓	✓		Leaders
Servicenow		✓	✓		Leaders
ClickUp		✓	✓	✓	Visionaries
Make		✓	✓	✓	Visionaries
Open AI		✓	✓	✓	Visionaries

It should be also mentioned that although each of the applications listed in Table 1 is a Low-Code application, in the Gartner matrix they are classified into different categories: Robotic Process Automation, Low Code Application Platform, and Collaborative Work Management.

Faster pace of application delivery using Low-code platforms is confirmed by research. Software development using Low-Code is about 3 times faster than using traditional coding methods [1]. Research conducted by Richardson and Rymer showed that low-code development platforms can help accelerate enterprise development and application delivery by 5 to 10 times [5]. Rapid application development is not the only benefit resulting from the implementation of low-code platforms. Other benefits [1; 2; 8] include:

- 81% of companies consider low-code development as key to their digital strategy, 66% of companies consider this technology as key to accelerating innovation and digital transformation;
- 53% of companies notice improved operational efficiency;
- 51% of companies report improved employee productivity;
- 42% of companies indicate reduced software development costs;
- 91% of managers consider scalability as a key feature of low-code platforms;
- 42% of companies consider security risks to be the biggest;
- 43% of European companies indicate limited customization possibilities, while in the US only 32% of companies;
- 38% of companies see the risk of uncontrolled implementation of low-code applications without IT oversight (development in the shadow of IT)

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– Insufficient training leads to ineffective use of these technologies. Only 51% of companies train employees.

Companies that use a structured approach to tool selection achieve 65% higher implementation efficiency [13]. When selecting tools, it is important to consider:

- Scalability – can AI, Zero/Low Code tools, automation tools grow with the company?
- Integration – do the tools work together and with existing infrastructure?
- Security – do the tools meet data protection standards?
- Cost of implementation and maintenance – what are the long-term expenses?

Due to the above criteria, ClickUp (Zero Code Platform), OpenAI (construction and training of AI models) and Make, used to automate and robotize processes and integrate all tools in the organization and build AI Agents, were selected to conduct classes on digitization at the Warsaw University of Technology.

Modern organizations, such as Mayo Clinic [3], combine the DevOps approach (agile management of software development and operations) with MLOps (lifecycle management of machine learning models) to effectively automate and integrate AI in everyday work. These experiences allow us to formulate key factors for the success of implementing AI-based process automation [3]:

- Application development by employees. This rapid development of AI at Mayo Clinic was the result of decentralizing application implementation and moving it to a place where people best understand the specifics of their work and know how to improve value delivery. The experience of Low-Code platform partners shows that delivering solutions in weekly cycles is effective [23]. Such teams should work agilely to obtain feedback and improve processes and algorithms (MLOps) every week.
- Support teams. In order for the adopted DevOps model to work and develop operations, support teams are also needed. The role of support teams is to help value stream delivery teams (DevOps) acquire missing capabilities (including knowledge, algorithms, legal regulations) through training, consultations and implementation of good practices. These can be internal or external teams.
- A team-providing infrastructure has been created. The role of this team is to reduce the cognitive load of value stream delivery teams. Low/No-Code programming platforms authorized by IT staff can help solve the risk associated with development in the shadow of the IT department. Users can build the solutions they need on platforms without constantly disturbing IT staff. The IT department controls data and applications, ensuring security and privacy.
- Data quality management. A key element of effective automation using AI is taking care of data quality. Algorithms provide only as good results as the quality of the input data. Mayo Clinic uses a "data stewardship" approach, for preparing data for analysis. In order to constantly improve data quality management processes, teams should do it in a continuous mode, i.e. work agilely. Then they introduce improvements every week.

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At Warsaw University of Technology, students learn these methods in the context of a team approach to implementing automation and AI models, which reflects the real needs of the industry.

4 Results and Analysis of the Results

Enterprise Architecture (EA) management is a key aspect of IT strategy that allows organizations to better align technologies with business goals. There are several popular frameworks that help design, implement, and manage organizational architecture: Lean EA, Capstera, Gartner EA, TOGAF, Zachman Framework, FEAF and DODAF.

Table 2 [14;15;16;18;19] presents a comparison of the most popular architectural frameworks, their advantages and applications, and support for DevOps and MLOps. A rating of 0 indicates no support, 3 indicates full support.

Table 2. Comparison of architecture frameworks in the context of their applications, advantages, and support for DevOps and MLOps

Framework	Application	Advantages	DevOps support	MLOps support
Lean EA	Startups, Tech Companies, Digital Transformation	The most agile approach, supports AI and iterative changes	3	3
Capstera	Combining IT and business, e.g. fintech	Modular approach. Strategy and IT. Value streams, adaptation to changes. Ready models.	3	2
Gartner EA	Connecting IT and Business: Organizations Implementing Cloud and AI	Focus on business value, flexible approach	3	2
TOGAF	Large corporations	Process structure, broad industry support	2	1
Zachman Framework	Organizations with a strong hierarchy	Comprehensive analysis of IT structure	1	0
FEAF	Public institutions, administration	Process standardization, regulatory compliance	0	0
DODAF	Defense Sector, Cybersecurity	Interoperability, process control	0	0

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Since the key success factors for implementing AI-based process automation are the implementation of DevOps and MLOps [3], the best choices of architectural frameworks are Lean EA, Capstera, and Gartner EA. At the Warsaw University of Technology, students learn Lean EA and Capstera.

Using the Capster architectural framework allows you to define the structure of creating digitalization requirements. Based on the architectural framework [17], you can define models that are used at the Warsaw University of Technology in the process of learning digitalization:

- Strategic context – describes the vision, mission, strategies (increasing efficiency, development through innovation, new business models), business motivation of stakeholders, metrics and initiatives necessary to implement the company's strategy.
- Milky Way model [20] – this is an approach to analyzing and visualizing the entire organization on one page. It presents the relationships between business processes, applications in a holistic and easy-to-understand way. Building the model begins with creating a diagram with the value stream delivered as part of the Customer Journey. The map is divided into sectors: marketing and sales, service execution, after-sales service, management, product development. Business capabilities (processes, people, data and applications) should be placed in each sector. Then, you need to visualize the information flows between business capabilities (process-process, application-application and human-application). Finally, it is worth adding important elements from the Customer Journey (touchpoints, applications). The map can be made at various levels of detail of business capabilities and connections between business capabilities.
- Business services digitization – this is a model based on the Use Case model. At the center of the model is an actor (customer or partner), who uses business services. Each service is delivered by business processes (Milky Way model), which are supported by application services and applications. One application can deliver many application services. The model also shows the integrations between applications that need to be automated. This model is the basis for process digitization and defining functional requirements for applications.
- Strategic plan for business capability development – no company has an unlimited budget or time to digitize and standardize all processes at once. The key to success is wise prioritization. Some business capabilities determine competitiveness – they should be the most innovative and digitally advanced (product development, sales). Business capabilities that do not create a competitive advantage, but are essential for the smooth operation of the business should be digitized and optimized to work faster and more efficiently. Capabilities that do not create value – it is better to outsource them to external suppliers.
- Business capability maturity assessment – the model divides business capabilities into management, core and supporting. It presents an assessment of the business and technological maturity of each business capability. The model is needed to describe the required changes that must be made to increase the level of maturity of the business capability in the area of people, processes, and applications.

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- Change roadmap – based on the capability assessment, you can plan the implementation of changes. This will be helped by organizing around the value stream and assigning changes to the subsequent stages of the stream of competencies, processes, applications. At each stage of value creation, teams can deliver solutions working in DevOps and MLOps.
- Data presentation – views, reports, Kanban boards, lists, dashboards help visualize data or the effects of process implementation. Users define the way of presenting data needed to implement the process and to make decisions.

Table 3 [13] shows what results can be achieved by automating tasks, processes and decision-making processes. ROI analysis will allow you to estimate the return on investment in automation in the enterprise.

Table 3. Impact Analysis of AI Automation Implementation

Core Application	Key Benefits	Implementation Results	Category of automation
Email Systems	Startups, Tech Companies, Digital Transformation	The most agile approach, supports AI and iterative changes	Task
Meeting Management	Combining IT and business, e.g. fintech	Modular approach. Strategy and IT. Value streams, adaptation to changes. Ready models.	Task, decision
Document Processing	Connecting IT and Business: Organizations Implementing Cloud and AI	Focus on business value, flexible approach	Task
Customer Support	Large corporations	Process structure, broad industry support	Process, decision
Administrative Work/decision	Organizations with a strong hierarchy	Comprehensive analysis of IT structure	Task, decision
Robotic Process Automation	Defense Sector, Cybersecurity	Interoperability, process control	Process

Digital transformation requires rethinking traditional enterprise architecture frameworks. The framework of the future must be able to [14]:

— integrate digital technologies with business processes and models;
— support a customer-centric approach and create value for the customer;

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- enable rapid innovation and the ability to quickly respond to market changes and implement changes agilely;
- support DevOps, MLOps, service-oriented architecture (SOA), and micro services [3].

The result of developing the architecture is knowledge about the priorities of processes for digitalization, planning the necessary changes in people, processes and applications and the way of implementing the functional requirements of the application. It is also knowledge about process automation and integration between applications and processes.

Each process consists of tasks that provide a business service. Tasks flow through subsequent process stages, which are handled by departments and within them by specific business roles. This section discusses how to automate processes, tasks, and decision-making using AI Agents and standardize processes and tasks. There are 5-step procedure for building AI Agents, which can be used during classes [21].

1. Defining the goal. The basic question in the automation process is which processes to automate? They are could be email systems, meeting management, document processing, etc. [13].
2. Technology selection. Using Low-Code platforms, platforms for process automation and robotization, and AI algorithms allows for the quick creation of efficient and scalable solutions [4]. The aforementioned solutions are used to build AI Agents. In the process of teaching digitalization at the Warsaw University of Technology, Make, OpenAI, Click Up software is used. The above-mentioned tools enable the creation of various AI Agent architectures: rule-based, using machine learning, and hybrid.
3. AI training. Using the organization's knowledge to train the model. An example of an AI Agent in a hybrid architecture is the automation of the service's mailbox. It uses AI to analyze the content of the email, categorize it, recognize sentiment, and prepare a response to the customer in the case of various scenarios. This programming is done through demonstration. The rules, on the other hand, are used to take appropriate actions such as sending a confirmation, rejecting the report, handling a repeat message for the report, creating a new report. If the AI Agent's operation is to show the results of its work to the user, then a user interface (chat, application form) should be created. For example, when handling a service box, the user interface will be a list of service requests and the ability for the service technician to handle these requests on the Kanban board.
4. Integration with other systems. Process flow digitization involves the integration of various applications or processes (business services digitization shown in the model). This can be a continuation of the process on another team's board (e.g. an order for shipment appears in the logistics department after the service has performed a repair). It can also be an import of leads from a Facebook ad or receiving/sending emails.
5. Testing and implementation – usability tests and performance optimization in accordance with the MLOps model.

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Standardization of processes and tasks is also an important element of work automation, which ensures high repeatability. New possibilities of standardization appear along with new applications of Low/Zero Code [22]. How many times does each team create the same tasks from scratch (e.g. webinar organization plan, employee onboarding, recruitment)? Each time, employees define steps, assign responsible persons and estimate time. It is a waste of energy and resources. In addition, it is enough to identify repeatable processes (e.g. marketing campaign management). Then, processes should be divided into tasks and subtasks (e.g. onboarding, recruitment, webinar organization). Breaking down tasks into smaller subtasks will make it easier for employees to complete and track them. Then, for each task, the time of execution should be estimated; a responsible role and document templates (e.g. order, contract) should be assigned. Such a standardized process or task can be saved as a reusable template. Such a template can be automatically loaded when creating a new task, saving time each time the work is defined (e.g. onboarding a newly hired employee).

Research question: Which method of teaching digitization is more effective in terms of the time needed to acquire the knowledge necessary to perform process automation tasks?

The subject of the study are digitization courses conducted using Low/Zero Code and traditional methods. The subject of the study is the effectiveness of teaching digitization and the time needed to prepare for independent process automation measured by achieving the following learning abilities:

- to build DevOps teams, agile management of such a team and software development;
- to manage the MLOps machine learning lifecycle;
- to create a digitization architecture and analyze digitization needs;
- to build applications and standardize processes on the ClickUp platform;
- to integrate selected applications and automate tasks using the Make platform;
- to program AI Agents using the Make and OpenAI platforms.

A group of students of digitalization at the Warsaw University of Technology completed a course lasting 45 hours of study (15 hours of lectures, 15 hours of exercises, and 15 hours of laboratory). After completing the course, students were ready to implement process automation tasks, which they confirmed by performing a digitalization project and thus confirming the achievement of learning outcomes. The second object of the study were programming courses, the completion of which allows for the achievement of comparable learning outcomes, but using traditional programming methods. In order to identify them, a strategy of systematic search of available online courses was used, focusing on programs with the shortest duration, which at the same time ensure the achievement of all required competences. During the analysis, it was indicated that the following courses (104.5h) should be completed:

- Agile & DevOps Leadership – IC Agile Certification (16h)
- AI Agent Design (15h) – maven.com
- Business Architecture Training Program (4.5h) – Capstera
- Automation Agent (9h) – Bots and People
- Python Developer with Django (60h) - Noble Desktop

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In addition, it is important to highlight the following criteria were used to select training companies:

- The company specializes in training topics and conducts training at various levels on a given topic
- The shortest training that provides the expected learning outcomes was selected.

This study aimed to compare the effectiveness of teaching digitization and process automation using Low/Zero-Code platforms and traditional programming methods. The analysis also included the time needed to train a process automation specialist. The results of the study clearly indicate that the Low/Zero-Code method is much more effective in terms of learning and implementation time. Students of the Warsaw University of Technology using Low-Code platforms achieved the required competences in 45 hours, while programmers learning traditional programming languages (e.g. Python) need 104.5 hours to acquire the same skills. This means that learning Low/Zero-Code was 232% faster.

5 Discussion

The use of Low/Zero-Code platforms allows for faster implementation of applications and digitalization processes, which is also confirmed by previous studies. Previous researchers showed that creating, testing and configuring software using Low-Code is 3 times faster than using traditional programming methods [1]. These results are consistent with our findings - learning, digitization and automation of processes using Low-Code is much more time-efficient.

In the context of the labor market and education, the key question is, can Low-Code replace traditional programming? Low-Code is an ideal tool for non-technical people who want to implement digitalization in companies without the need for in-depth coding knowledge. By 2026, over 80% of Low-Code tool users will not have formal programming education, which indicates the growing role of this technology in business. Companies using Low-Code can respond faster to internal or market needs and deliver solutions in a shorter time, which is key in the digital transformation strategy [9]. This is confirmed by OutSystems data - 65% of companies have to implement at least 10 applications in 3-4 months, and 23% more than 50 applications in 5-6 months in a short time. Companies at different levels of digital maturity can benefit from Low-Code, achieving their goals. Companies at maturity level 3-4 (strategic digitalization, integrated digitalization) can accelerate the implementation of digitalization in key areas. Companies at maturity level 5-6 (Continuous innovation) can use Low-Code in combination with AI for automation and intelligent data management [6].

Traditional programming still has an advantage in flexibility and customization of solutions - complex algorithms and application functions, large databases still require coding. However, advanced AI models and machine learning algorithms can already be delivered using Low/Zero Code tools, due to the possibility of using NLP.

Despite many advantages, Low-Code is not a perfect solution. KPMG reports that 42% of companies indicate security risks as a major problem, and 38% of companies

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see the risk of so-called "shadow IT" - uncontrolled application deployment without IT department supervision [2]. Therefore, although Low-Code is effective, it requires appropriate supervision, integration with IT and care for security. The article indicates how to solve these problems. The implementation of a DevOps team topology, which is responsible for creating value (process automation using AI supported by MLOps), support teams and platform delivery teams will certainly help in this.

6 Conclusions

Addressing the topic of the effectiveness of teaching process automation is an important topic, which is confirmed by KPMG research in 2024 [2]. According to them, only 51% of companies provide employees with appropriate training, which can lead to ineffective use of this technology. Low-Code is much more time-efficient than traditional programming, which is confirmed by both our research and previous [1]. Learning digitization using Low-Code is 232% faster than traditional programming, which allows for faster training of employees and implementation of digitization. Low-Code changes the way digitization is taught - it allows for faster implementation of solutions, but still requires supplementation with traditional programming for more complex projects.

We have shown that automation is not only about replacing human work with a machine and AI algorithms. It is also about standardization and templates that speed up the registration of tasks and the implementation of processes. Low-Code accelerates digital transformation and is particularly valuable for companies at levels 4, 5 and 6 of digital maturity [6]. Low-Code has its limitations (security, IT control), but their proper management (DevOps and MLOps team topologies) allows for the full use of the potential of this technology.

The results of this study point to several important areas for further researches:

1. Analysis of the long-term impact of Low/Zero Code education – future studies could investigate how students use the acquired skills in professional practice and whether Low/Zero Code technologies become a key element of their daily work.
2. Impact of Low-Code integration with AI – further experiments could investigate to what extent AI tools such as LLM (e.g. OpenAI, Make) can improve the efficiency of implementing digitization and automation in education and industry.
3. Comparison of different Low/Zero Code platforms – it is worth conducting a comparative analysis of different tools (e.g. ClickUp, OutSystems, Power Apps) in terms of the efficiency of teaching and implementing automation.
4. Impact of Low-Code on employees' soft skills – it is worth investigating whether Low/Zero Code education supports the development of analytical skills, creativity and teamwork in the context of managing digitization projects.

Low-Code and AI are the future of digitalization and process automation, allowing for faster implementation of changes and increasing the efficiency of the organization. However, their effective use requires an appropriate strategy, teamwork methods, methods of analyzing the needs of digitalization, training and tools that allow for the rapid

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creation of applications and standardization of processes, automation of processes, tasks and communication, as well as the use of AI algorithms based on NLP.

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