Theoretical and Practical Research in Economic Fields

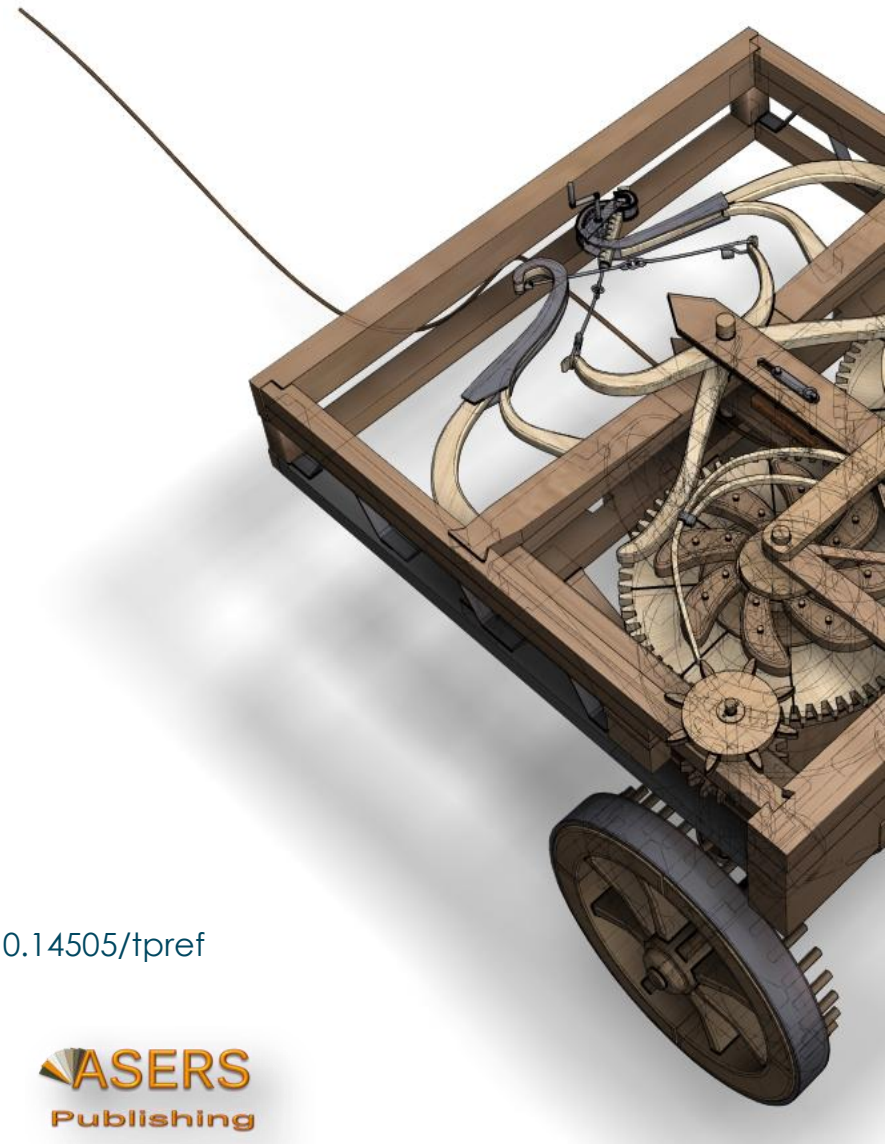

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Table of Contents

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Theoretical and Practical Research in Economic Fields

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Artificial Intelligence in Accounting: Revolutionizing Financial Management in the Digital Landscape

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Abstract: The use of artificial intelligence (AI) builds up the accounting system efficiency, increases data entry accuracy and simplifying the accounting process. The aim of the study is to prove the effectiveness of modern AI-based information technologies (IT) in accounting and the possibilities of AI application for process optimization. The effectiveness and efficiency were proven using comparison methods, statistical analysis, graphical cause-and-effect analysis, modelling using the linear regression method. The assessment was carried out using quantitative and qualitative indicators of labour productivity and process optimization. The results of the study showed that 18 accounting department employees on average are needed to perform standard transactions in the companies studied without AI. With AI, 1 person can handle such a volume of work. Accordingly, with the implementation of AI, the average reduction in Transaction Processing Time per Week is 696.26 hours. Regression analysis confirmed that the implementation of AI increases the companies' productivity in terms of Transaction Processing Time. Reducing the Data Processing Complexity by one unit leads to a reduction in transaction processing time by 592.69 seconds. Each percent increase in Data Entry Accuracy contributes to a reduction in processing time by 5135.51 seconds. The prospects for implementing AI in accounting include further improving algorithms to increase the accuracy and speed of transaction processing, optimizing material and time consumed.

Keywords: artificial intelligence; accounting; financial management; digital environment; automation; machine learning; data analytics.

JEL Classification: M11; M15; M21; M41; C01.

Introduction

Solving complex accounting issues in the system of economic information flow and the formation of business on an increasing scale of accounting becomes relevant and appropriate. The solution implies the adoption and use of AI and programmes based on it. AI enables arranging information, provide quick access to databases, analyse and structure information, perform complex calculations in a short period of time, eliminate human error, etc. This is not a complete list of advantages, but it justifies the need to move accounting to a new level (Brukhanskyi, Spilnyk, 2020).

The latest implementation was AI, blockchain technologies, large databases. These technologies and programmes based on them have reduced the monotony and uniformity of work to almost zero, increasing the potential for data processing. Therefore, the use of AI in business management has become a relevant topic. Questions about developing strategies and methods for using AI form the basis of many studies by researchers and prominent figures (Gupta *et al.* 2021).

At the same time, these innovations do not leave aside the economic aspects of life and development. So, the integration of the achievements of the scientific and technical process into the life of enterprises and farms is reflected in accounting, which is a constant tool of economic information (Benko, Moskaliuk, 2022). The combination of AI, the achievements of scientific progress and human economic activity, which leads to the growth and prosperity of the economy, leads to increased forms of control and accounting. This leads to the search for new safe and effective methods of solving problems, one of which is the implementation of AI. AI accumulates, groups and systematizes information, and is used for business management (Butynets *et al.* 2022; Zaporozhets, 2020).

Globalization of business management processes consists in using the latest digital technologies that improve the quality of management processes, speed up accounting, increase the effectiveness of activities, and enhance security. However, the globalization process is accompanied by a number of problems that arise in any innovation processes (Smiesova *et al.* 2019). This is especially true for accounting, where these implementations must be organized from the perspective of law, regulation, and reliability. Moreover, the process must be accompanied by maintaining confidentiality for each enterprise (Al-Okaily & Alsmadi, 2024). Therefore, the issues of creating uniform legal norms for the digital process and developing applied tasks for the implementation of ITs of a specific type are relevant.

An important feature of the study is that it fills the existing gaps in the scientific literature on the implementation of AI in accounting activities, offering a quantitative assessment of its impact on the performance of accounting systems. The novelty of the work is the proposed approach to modeling the speed of transaction processing after the implementation of AI and identifying key factors that affect the efficiency of automated processes.

The aim of the research is to reveal the potential of modern AI-based ITs in accounting and the possibilities of its application for process optimization. Research objectives:

- Analyse the work of the enterprise for the year using traditional accounting methods (manual accounting, use of Excel tables, and classic accounting programmes) and AI-based programmes;
- Conduct a comparative analysis of the obtained data by qualitative and quantitative performance indicators (number of errors, processing time of transactions, processing complexity, etc.);
- Describe the relationship between the studied indicators using a causal cyclic diagram;
- Conduct a regression analysis of the impact of indicators on productivity, expressed through the indicator of transaction processing time.

1. Literature Review

Globalization opens up great opportunities for business and entrepreneurship, providing a number of positive tools in their work. Economic aspects are aimed at facilitating business and accounting, and therefore their implementation should be based on research data confirmed by time. Prominent researchers have shown a general assessment of AI in the areas of accounting (Nikonenko *et al.* 2022, Wang *et al.* 2022). In contrast, the work (Savkiv, Kuzmin, 2023) reflects the prospects for introducing AI into accounting when transitioning to a new level of reporting. The works (Hasan, 2021; Thapa & Camtepe, 2021) reflect a number of shortcomings and unresolved issues, such as protecting confidential data, conducting training, and the difficulties of transitioning to a new level of programmes and tools that appear today. The study (Sunardi *et al.* 2020) reproduces the problems of fraud and lack of transparency in reporting. The article (Cho, 2024; Lysenko *et al.* 2024) examines the issues of harmonization of international standards and cooperation at the level of global cybersecurity. The researchers' results are valuable for outlining the key problems of accounting in the context of progress and globalization.

However, the authors' approaches lack specifics, as they define the AI implementation as a universal way to solve problems without providing specific evidence.

More practical results were obtained in works describing the AI integration into the accounting of companies. Such issues of implementing AI into the accounting system as the selection of effective software and the need to monitor the updating of programmes are described in (Pravdiuk *et al.* 2022). The researcher (Pilevych, 2020) described the first stages of implementation. These steps are complex, require a lot of attention and effort. A number of researchers note that the successful integration of AI into accounting requires training and brings the accountants' competencies into line with modern requirements (Lelyk *et al.* 2022). The results of (Megits *et al.* 2022) show that the current profiles of accountant competence do not meet the latest requirements for business analytics competencies. These conclusions are consistent with the findings of (Xu *et al.* 2021), which describe the problem of the lack of specialists of the appropriate level and provides a base of the necessary software. However, the mentioned studies lack recommendations for actions that need to be taken to ensure a safe and effective transition. Instead, Damerji and Salimi (2021) provide some important recommendations that ensure a more effective implementation of AI in accounting. In particular, the researchers found a significant impact of accounting students' technology readiness on the successful AI integration into accounting.

As for the prospects for the impact of AI on the accounting profession itself, researchers are inclined to believe that the tasks and skills of the profession will change significantly in the coming decade. In particular, AI will take over a significant share of the tasks of an accountant (Leitner-Hanetseder *et al.* 2021). At the same time, other researchers (Riinawati, 2021) believe that AI, given the stereotyped thinking, lack of independent thought and professionalism, will not be able to completely replace an accountant. Other researchers are working to eliminate the shortcomings of AI. For example, using Explainable AI methods Zhang *et al.* (2022) seek to solve the problem of the lack of explanation of AI results.

The researchers who have shown the AI application in the financial and economic analysis of an enterprise's activities reached valuable conclusions. The work (Bilous *et al.* 2023) reproduces the results of the analysis of financial and economic activities using AI. The work is practical, shows positive trends, but does not sufficiently describe the advantages of using AI by different companies, their experience and mistakes. The study (Zhylin, M. 2024) shows data analytics, inventory control, analysis of costs and deviations in the system's operation, which is the basis for making investment decisions. The researchers (Kulynych *et al.* 2020) show the possibilities of identifying problems, improving management processes, planning a budget, calculating costs, describing development plans, etc. Han *et al.* (2023) noted the possibilities of AI for recognizing and applying patterns to expand decision-making. However, all issues are presented somewhat one-sidedly in the studies. There are no practical recommendations and concepts for a holistic approach to generalized experience in building modern information technologies and programmes.

Specific benefits of using AI in accounting, supported by quantitative calculations based on the results of a survey, are provided in (Vărzaru, 2022). The researchers found that the implementation of AI allows for significant reduction of processes and improvement of the use of accounting information. Based on the survey conducted by other specialists, Bakarich & O'Brien (2021) also found that AI has not yet had a significant impact on accounting at the time of writing their work. In particular, this applies to robotic process automation (RPA) and machine learning (ML). However, according to the results of the researchers, significant changes are expected in the future. Rane (2023) analysed the use of ChatGPT as an example of generative AI (GenAI) in accounting. The researchers identified such benefits as automation of data entry, categorization and creation of reports, reduction of errors and operational costs. At the same time, the work lacks a quantitative analysis of the impact of the implementation of AI on specific aspects of accounting activities and determination of the level of effectiveness of innovations.

Although AI cannot completely replace humans, it is capable of planning, forecasting, calculating profitability, financial performance of a company, identifying weaknesses, drawing conclusions, and making a development forecast. The need for further research is determined by continuous AI development, which provides ample opportunities for improving the efficiency of accounting. This study contributes to the existing knowledge on the AI use in accounting by analysing its impact on specific aspects of accounting activities and assessing efficiency.

2. Methodology

2.1. Research Design

The preparatory stage of the study included the selection of companies, indicators, and data formatting for analysis. The main stage involved the analysis of the selected indicators before and after the AI implementation using a number of scientific methods. The final stage involved the evaluation of the obtained data.

2.2. Sample

To assess the effectiveness of implementing AI in accounting, a sample of companies was formed for the study. The total number of companies considered for the sample was 14 companies. The companies were selected based on the international status of the company and the duration of AI-based accounting. Such international-class companies with branches in Ukraine, Romania, Poland, the USA, Germany, Colombia, Italy, Spain and Chile include SoftServe, Infopulse, Intellias, GlobalLogic, and Sigma. This list also includes Data Science UA, Lemberg Solutions, Artelogic, Innovecs, Toptal, Bayesian Health, Coinbase, Gigster, and GlobalLogic Germany GmbH. All of these companies implemented AI-based programmes. The selected number of companies is sufficient for the study. These companies used Docyt AI and BotKeeper-based accounting programmes.

The efficiency of the accountant was assessed by using the selected quantitative indicators of labour productivity and process optimization. They include the average number of input data entries, the speed of processing banking transactions, the number of types of banking transactions. These data were collected and calculated from standard accounting programmes SAP, M.E. Doc and BAS Accounting. However, one cannot judge the accountant's efficiency by quantitative indicators alone. It is necessary to take into account qualitative indicators, such as the correctness of data entry, the complexity of data processing, the typicality and monotony of work. The following indicators served as qualitative indicators of the work performed: the number of errors made, the repeatability and uniformity of errors.

2.3. Methods

The study employed *the method of comparing the obtained data* on the efficiency of the enterprise using traditional methods and using AI. Traditional methods include manual accounting, the use of Excel tables, and classic accounting programmes. The programme for traditional accounting (SAP, M.E. Doc and BAS Accounting) recorded the receipt of *quantitative data* by time and the number of registrations. The total number of data registrations or banking transactions was determined per day and per reporting period. The final result was the percentage of registrations that met the established standards and time. The number of errors made when entering data was also recorded. The registration time is considered to be the period from the moment the data entered the system to the moment they were processed by the accountant or AI. The accuracy of information recording was deduced from the data on the number of errors made, repeatability and uniformity of errors in accordance with the amount of incoming information flow. The indicator of process optimization and efficiency of the enterprise was compiled based on data from the SoftServe company, which was collected from the moment AI was introduced.

Qualitative indicators, such as the correctness of data entry, the complexity of data processing, were determined as the ratio of the number of errors to the total volume of transactions, taking into account the indicators of typicality and monotony of work, which means the multiple repetition of monotonous short-term operations, actions, cycles. This indicator was introduced for the work of an accountant based on programmes without AI, as the typicality and monotony of work disappears with the introduction of AI-based programmes. The accountant's work was assessed during the year from October 2022 to October 2023 to cover all accounting periods.

Using the method of *comparison* relative to the observed indicators made it possible to preliminarily assess that the efficiency for each of the studied indicators has significantly increased. S*tatistical analysis* of the indicators clarified the increase in efficiency. The findings obtained through *graphical cause-and-effect analysis* gave grounds for building a *causal cyclic diagram*, which helped to show the relationships between the indicators and the direction of the relationship. The model built using the linear regression method helped to determine the impact of indicators on increasing productivity, expressed through the transaction processing time, as well as predict this indicator.

2.4. Instruments

The data were collected from SAP, M.E. Doc and BAS Accounting programmes and company reporting. The effectiveness of AI implementation was studied based on Docyt AI and BotKeeper software. StatPlus Pro for Windows and Excel was used for calculations and statistical data processing.

3. Results

AI-based programmes are advisable to implement for solving monotonous tasks of the same type or for non-standard tasks with high complexity. AI-based programmes and tools solve a number of issues with fairly high efficiency. Table 1 presents the results of a study on the implementation of AI-based software Docyt AI in accounting in a number of companies.

Table 1. Results of AI implementation in accounting

Company		Transaction type	Number of transactions in the company for the reporting period	Number of transactions per day, pcs	Number of transactions per month, pcs	Transaction processing time, s	Number of errors	Correctness of data entry,%	Data processing complexity	Percentage of registrations for the reporting period, %	Taking into account the complexity of the work, and the coefficient of typicality and monotony of the work
SoftServe	Without AI	Invoice Processing Banking transactions Customer Incoming Emails	398	6	134	7265	25	6.28	65	33.67	42.08
	With AI			18	398	22	0.5	0.13	0.06	100	
Infopulse	Without AI		618	9	200	10865	23	3.72	58	32.36	40.45
	With AI			28	618	21	0.51	0.08	0.08	100	
Intellias	Without AI		706	12	266	14465	29	4.11	77	37.68	47.09
	With AI			32	706	23	0.45	0.06	0.1	100	
GlobalLogic	Without AI		552	17	376	20465	18	3.26	68	68.12	85.14
	With AI			25	552	22	0.51	0.09	0.069	100	
Data Scince UA	Without AI		838	24	530	28865	31	3.70	66	63.25	79.05
	With AI			38	838	23	0.62	0.07	0.098	100	
Lemberg Solutions	Without AI		1388	36	794	43265	21	1.51	71	57.20	71.50
	With AI			63	1388	19	0.55	0.04	0.12	100	
Innovecs	Without AI		1278	29	640	34865	34	2.66	73	50.08	62.59
	With AI			58	1278	18	0.81	0.06	0.13	100	
Artelogic	Without AI		486	9	200	10865	22	4.53	65	41.15	51.44
	With AI			22	486	22	0.48	0.10	0.06	100	
Sigma	Without AI		618	12	266	14465	31	5.02	58	43.04	53.81
	With AI			28	618	21	0.56	0.09	0.08	100	

Toptal	Without AI		728	17	376	20465	23	3.16	77	51.65	64.56
	With AI			33	728	20	0.45	0.06	0.1	100	
Bayesian Health	Without AI		794	24	530	28865	18	2.27	68	66.75	83.43
	With AI			36	794	19	0.62	0.08	0.069	100	
Coinbase	Without AI		926	24	530	28865	33	3.56	66	57.24	71.54
	With AI			42	926	25	0.61	0.07	0.098	100	
GlobalLogic Germany GmbH	Without AI		1366	38	838	45665	19	1.39	71	61.35	76.68
	With AI			62	1366	16	0.55	0.04	0.12	100	
Gigster	Without AI		1212	29	640	34865	0.36	0.03	73	52.81	66.01
	With AI			55	1212	24	0.52	0.04	0.13	100	

Source: developed by the authors

Table 1 shows that AI-based programmes have a high level of efficiency, reliability, and reproducibility. The number of errors has been reduced to almost zero, work efficiency has been increased, all incoming information is processed on time, quickly, thoroughly, communication is being established, communication with clients is being carried out, and paperwork with partners is being carried out. Table 2 is proposed below to assess how much productivity has increased with the implementation of AI, where the change in indicators in percentages is determined for each company. The Table does not reflect indicators that were already presented in Table 1 in percentage terms.

Table 2. Percentage increase in indicators after the AI implementation

Company	Number of transactions per day	Number of transactions per month	Transaction Processing time	Number of errors	Data entry accuracy
Increase/decrease, %					
SoftServe	200.00	197.01	-99.70	-98.00	6.15
Infopulse	211.11	209.00	-99.81	-97.78	3.64
Intellias	166.67	165.41	-99.84	-98.45	4.05
GlobalLogic	47.06	46.81	-99.89	-97.17	3.17
Data Scince UA	58.33	58.11	-99.92	-98.00	3.63
Lemberg Solutions	75.00	74.81	-99.96	-97.38	1.47
Innovecs	100.00	99.69	-99.95	-97.62	2.60
Artelogic	144.44	143.00	-99.80	-97.82	4.43
Sigma	133.33	132.33	-99.85	-98.19	4.93
Toptal	94.12	93.62	-99.90	-98.04	3.10
Bayesian Health	50.00	49.81	-99.93	-96.56	2.19
Coinbase	75.00	74.72	-99.91	-98.15	3.49
GlobalLogicGermany GmbH	63.16	63.01	-99.96	-97.11	1.35
Gigster	89.66	89.38	-99.93	44.44	-0.01

Source: developed by authors

Table 2 shows that the number of transactions per day (month) has increased for all studied companies, but the growth varies depending on the specific company. For example, for Infopulse, the increase in the number of transactions per month is 209%, for Bayesian Health – about 50%. The time and complexity of processing transactions for all companies have decreased by more than 99%, the number of errors has decreased by 96.56-98.45% for most companies, except for Gigster. This is the only company where this indicator has increased by 44.44%, which could potentially be determined by inefficiency or errors in the automation process. Having these

data, it is possible to calculate how many employees in the accounting department are needed on average to perform standard transactions without AI and with the AI (Table 3). According to the table, this indicator is 18 (17.43) people without AI and 1 person (0.03) with AI. In hours per week, the average reduction in transaction processing time per week with AI is 696.26 hours.

Table 3. Determining the number of accounting department employees before and after the implementation of AI

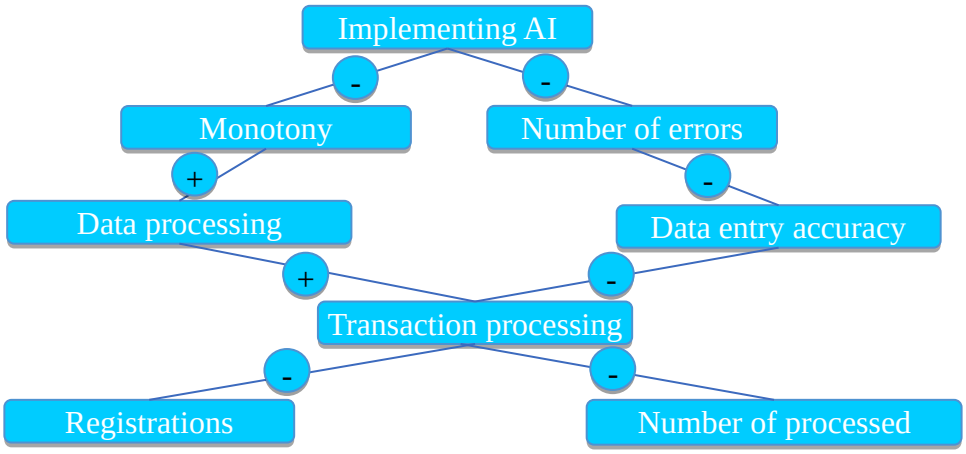
	Average number of transact+tions per day	Average number of transactions per working week (5 days)	Average transaction processing time	Average transaction processing time per week, s	Average transaction processing time per week, hours	Required number of employees assuming a 40-hour working week
Without AI	20.43	102.14	24579.29	2510598.47	697.39	17.43
With AI	38.57	192.86	21.07	4063.78	1.13	0.03
Change	18.14	90.71	-24558.21	-2506534.69	-696.26	-17.4

Source: developed by authors

The obtained results were visualized by building a causal cyclic diagram (Figure 1). The diagram reflects the relationship between the studied indicators. The "+" sign on the relationship line means that the increase (decrease) of one indicator is accompanied by an increase (decrease) of another, that is, the relationship is direct, "-" indicates an inverse relationship between the indicators.

The changes that had the greatest impact on the change in the productivity of accounting systems in companies which implemented AI were assessed through a regression analysis. The transaction processing time was used as a key productivity indicator, which was a dependent variable in the analysis. The independent variables were the complexity of data processing and the correctness of data entry. The causal cyclic diagram shows that these indicators are causally related to the transaction processing time. The diagram shows that the increase in processing complexity is accompanied by an increase in processing time (and vice versa), meaning that the relationship is direct. In turn, an increase in the correctness of entry reduces the processing time of operations, which indicates an inverse relationship between the indicators. The indicators of monotony, the number of errors, the percentage of registrations, and the number of processed operations were not included in the model due to insufficient specifics and/or multicollinearity. As shown in the diagram, these indicators do not interact with the number of processed operations through clear cause-and-effect relationships. They mainly affect variables already included in the model or are the result of reducing transaction processing time. Therefore, these indicators do not provide the model with reliable information to explain the variation of the independent variable and were not considered in it.

Figure 1. Causal cyclic diagram of relationships between the studied indicators



Source: developed by authors

The chosen approach to building the regression model allowed to obtain a fairly high-quality model. The correlation coefficient was 0.943, which indicates a strong positive relationship between the dependent and independent variables. In particular, this indicates the importance of the factors included in the model for predicting the number of processed transactions. The coefficient of determination was 0.888, and the adjusted

coefficient of determination was 0.879. This indicates that about 88% of the variation in the processing time of operations can be explained by the independent variables included in the model. Table 4 contains the results of the ANOVA analysis.

Table 4. Results of the ANOVA analysis

	df	SS	MS	F	Significance F
Regression	2.00	5505398486.07	2752699243.04	99.56	0.00
Residual	25.00	691199958.03	27647998.32		
Total	27.00	6196598444.11			

Source: developed by authors

The Significance F and F-statistic values in Table 4 indicate the statistical significance of the constructed regression model. The regression sum of squares (SS Regression = 5505398486.07) accounts for a significant proportion of the total variance (SS Total = 6196598444.11), and therefore the model explains well the variation in the number of processed transactions. The residual sum of squares SS Residual = 691199958.03 indicates the proportion of unaccounted variation. Table 5 presents the regression results.

Table 5. Regression results

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	511.70	1408.05	0.36	0.72	-2388.23	3411.62
Data processing complexity	592.69	46.65	12.70	0.00	496.60	688.77
Data entry accuracy	-5135.51	834.64	-6.15	0.00	-6854.48	-3416.53

Source: developed by authors

According to the results of the regression analysis, both independent variables included in the model are statistically significant at $p<0.05$. The regression coefficient for data processing complexity indicates that an increase in the complexity indicator by one unit causes an increase in the transaction processing time by 592.69 seconds. Each percentage increase in the data entry accuracy contributes to a decrease in processing time by 5135.51 seconds. The regression model has the form:

*Transaction processing time = 511.7 + 592.69 * Data processing complexity – 5135.51 * Data entry accuracy.*

The obtained results allow us to better understand which factors affect the increase in the efficiency of the accounting system with the AI implementation. The calculated regression coefficients give companies a clear idea of whether the AI implementation in the companies' activities meets their expectations regarding increased productivity. The constructed model can be used to predict the increase in productivity of companies with the AI implementation.

4. Discussions

All over the world, there is an active introduction of smart technologies into economic activities. The use of many digital practices and programmes has shown good results, which is reproduced in the works of researchers (Savkiv, Kuzmin 2023; Lysenko *et al.* 2024). The results of the author's study are consistent with the conclusions (Bilous, Kundeus, 2023; Pilevich, 2020), which proved the effectiveness of the AI introduction in accounting. Our study confirm the opinion of (Megits *et al.* 2022; Pravdyuk *et al.* 2022), which showed that companies where AI was introduced develop more progressively and have more opportunities.

The advantages of using AI are shown in many studies through the use of questionnaires and interviews. As in the author's study, Vărzaru (2022) proved that AI contributes to a significant reduction in accounting processes. Abdullah and Almaqtari (2024) concluded that AI in accounting allows to increase efficiency, accuracy and improve decision-making capabilities. Emetaram and Uchime (2021) noted that the AI implementation significantly increases the accountants' productivity. Judging by the mentioned studies, the AI effectiveness of is confirmed in the practice of countries with different levels of development — Romania, Saudi Arabia, Nigeria. However, the methods used by the researchers have certain limitations caused by the subjectivity of the respondents' views. Unlike these studies, the quantitative impact of AI on specific aspects of accounting was confirmed in the author's study by calculating the percentage of efficiency increase. Moreover, regression analysis identified the degree and direction of the influence of individual efficiency indicators on increasing work productivity.

The results of some studies contradict the author's study. In particular, Bakarich and O'Brien (2021) and Gonçalves *et al.* (2022) noted that the digitalization of accounting is only at the initial stage and has a minor impact on the main processes. At the same time, the author's work found that the AI technologies implemented by the studied companies are already having a significant impact on efficiency. The mentioned studies took into account the practice of developed countries, such as the USA and Portugal, so the found differences cannot be explained by the insufficient level of technological development in the respective countries. Instead, the differences can be explained by different approaches to sampling: the author studied large international companies, while the mentioned studies focus on small businesses. This assumption is confirmed by the work of Nóbrega *et al.* (2023), who noted the lack of potential of small and medium-sized enterprises to implement AI because of weak financial capacity.

The practical application of the author's findings is to quantify the efficiency gains from AI implementation. The regression model obtained in the work allows predicting efficiency gains after AI implementation. This information may be useful for enterprises that plan to use AI in their operations.

4.1. Limitations

The limitations of this study are determined by the difficulties of development in recent years, which is associated with the pandemic. It should be noted that the sample of companies was formed on the basis of their willingness to participate in the study and reluctance to submit their data for analysis. Besides, the software package was selected for the study based on the programmes that the companies currently work with.

4.2. Recommendations

The obtained results give grounds to provide the following recommendations:

- Increasing the data entry accuracy and reducing the processing complexity significantly reduce the time for processing operations. Therefore, it is advisable to give preference to solutions that include automatic verification, error correction and data structuring when implementing AI;
- Successful implementation of AI depends, among other things, on the ability to use new technologies. Therefore, the implementation of training and education of personnel is an effective solution for increasing efficiency.

Conclusions

Taking into account the undisclosed aspects of the problems of AI implementation by other authors, the work revealed the potential of AI for fast, reliable and timely processing of accounting information. The effectiveness of AI implementation was proven based on the study of several programmes. It was determined that the implementation of innovative technologies based on AI in the accounting system can significantly increase the efficiency of accounting activities, affecting labour productivity.

The work found that 18 accounting department employees on average are needed in the studied companies to perform standard operations without AI. With AI, 1 person can handle this amount of work. The average reduction in transaction processing time per week with AI is 696.26 hours. It was also found that the implementation of AI by large companies affects productivity, expressed through the indicator of the transaction processing time. The constructed regression model demonstrates that this indicator is significantly influenced by such indicators as the data processing complexity and the data entry accuracy. It was found that by reducing the complexity of processing by one unit, the processing time of transactions is reduced by 592.69 seconds. Each percentage increase in the correctness of data entry contributes to a reduction in processing time by 5135.51 seconds.

The determined percentage changes in the efficiency of various aspects of accounting after the AI implementation allow companies to determine whether the implementation of AI meets their goals. The regression model obtained in the work makes it possible to predict the increase in efficiency after the AI implementation. This could be useful for businesses that plan to use AI in their operations. Further research could be aimed at determining the impact of risks on the effectiveness of AI implementation, such as data loss, cyberattacks, etc.

Credit Authorship Contribution Statement

Mohammad Ahmad Alnaimat: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition;

Inna Korsun: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition;
Kostiantyn Lutsenko: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition;
Oleksandr Khodorkovskyi: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition;
Mykyta Artemchuk: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing, Visualization, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have used generative AI and AI-assisted technologies in the writing process before submission, but only to improve the language and readability of their paper and with the appropriate disclosure

References

[1] Abdullah, A.A. H., and Almaqtari, Faozi A. (2024). The impact of artificial intelligence and Industry 4.0 on transforming accounting and auditing practices. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1): 100218. DOI: https://doi.org/10.1016/j.joitmc.2024.100218

[2] Al-Okaily, Manaf, Alsmadi, Ayman Abdalmajeed. (2024). The role of metaverse and blockchain in enhancing digital Islamic finance: Empirical perspective. *Journal of Islamic Marketing*: 1-15. DOI:https://doi.org/10.1108/JIMA-11-2023-0369

[3] Bakarich, K. M., and O'Brien, P. E. (2021). The robots are coming… but aren't here yet: The use of artificial intelligence technologies in the public accounting profession. *Journal of Emerging Technologies in Accounting, 18*(1): 27-43. DOI: https://doi.org/10.2308/JETA-19-11-20-47

[4] Benko, Mykola, Moskalyuk, Hanna. (2022). Accounting and management reporting in the context of globalization and digitalization: innovations and challenges. In: M. A. Goldenblat (ed.) *Державне управління та адміністрування, сфера обслуговування, економіка та міжнародні відносини як рушійні сили економічного зростання держав XXI століття,* pp. 1-18. Vinnytsia: European Scientific Platform. DOI:https://doi.org/10.36074/paaaseeirdfegcc.ed-2.07 (in Ukrainian).

[5] Bilous, O., and Kundeus, O. (2023). Transformation of accounting in the digital economy. *Galician economic journal, 83*(4): 56-61. DOI: https://doi.org/10.33108/galicianvisnyk_tntu2023.04.056 (in Ukrainian).

[6] Brukhansky, R., and Spilnyk, I. (2020). Digital accounting: concepts, roots and current discourse. *The Institute of Accounting, Control and Analysis in the Globalization Circumstances, 3*(4): 7-20 (in Ukrainian)

[7] Butynets, F. F., Ivakhnenkov, S. V., Davydiuk, T. V., and Shakhraychuk, T. V. (2022). *Accounting Information Systems*. ZHITI. (in Ukrainian).

[8] Cho, O.-H. (2024). Analysis of the impact of artificial intelligence applications on the development of accounting industry. *Nanotechnology Perceptions, 20*(S1): 74-83. DOI: https://doi.org/10.62441/nano-ntp.vi.390

[9] Damerji, H., and Salimi, A. (2021). Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting. *Accounting Education*, *30*(2): 107-130. DOI:https://doi.org/10.1080/09639284.2021.1872035

[10] Emetaram, E., and Uchime, H. N. (2021). Impact of Artificial Intelligence (AI) on Accountancy Profession. *Journal of Accounting and Financial Management*, *7*(2): 15-25. Available at: https://www.iiardjournals.org/get/JAFM/VOL.%207%20NO.%201%202021/Impact%20of%20Artificial%20Intelligence.pdf

[11] Gonçalves, M. J. A., *et al.* (2022). The future of accounting: How will digital transformation impact the sector?, *Informatics, 9*(1): 19. DOI: https://doi.org/10.3390/informatics9010019

[12] Gupta, M., *et al. (*2021). Application of fuzzy logic data analysis method for business development. *Lecture Notes in Networks and Systems,* 194: 75-93. DOI: https://doi.org/10.1007/978-3-030-69221-6_7

[13] Han, H., *et al.* (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. *International Journal of Accounting Information Systems*, *48*: 100598. DOI:https://doi.org/10.1016/j.accinf.2022.100598

[14] Hasan, A.R. (2021). Artificial intelligence (AI) in accounting & auditing: A literature review. *Open Journal of Business and Management*, *10*(1): 440-465. DOI: https://doi.org/10.4236/ojbm.2022.101026

[15] Kulynych, M., Shvorak, A., and Zhilenko, L. (2020). Implementation of digital literacy under conditions of the future changes in accountant profession. *Economic journal of Lesya Ukrainka Volyn National University*, 1: 216-224. DOI: https://doi.org/10.29038/24114014-2020-01-216-224 (in Ukrainian)..

[16] Leitner-Hanetseder, S., *et al.* (2021). A profession in transition: Actors, tasks and roles in AI-based accounting. *Journal of Applied Accounting Research*, *22*(3): 539-556. DOI: https://doi.org/10.1108/JAAR-10-2020-0201

[17] Lelyk, L., *et al.* (2022). An integrated analysis of enterprise economy security. *Decision Science Letters, 11*(3): 299-310. DOI: https://doi.org/10.5267/j.dsl.2022.2.003

[18] Lysenko, S., *et al.* (2024). Global cybersecurity: Harmonising international standards and cooperation. *Multidisciplinary Reviews, 7*: 2024spe021. DOI: https://doi.org/10.31893/multirev.2024spe021

[19] Megits, N., *et al.* (2022). The «five-helix» model is an effective way to develop business in industry 4.0 of selected countries. *Journal of Eastern European and Central Asian Research, 9*(2): 357-368. DOI:https://doi.org/10.15549/jeecar.v9i2.920

[20] Nikonenko, U., *et al.* (2022). Assessing the policy of attracting investments in the main sectors of the economy in the context of introducing aspects of industry 4.0. *International Journal of Sustainable Development and Planning, 17*(2): 497-505. DOI: https://doi.org/10.18280/ijsdp.170214

[21] Nóbrega, V., *et al.* (2023). The impact of artificial intelligence in accounting: Application in SMEs. *International Journal of Electronic Finance*, *12*(2): 192-214. DOI: https://doi.org/10.1504/IJEF.2023.129923

[22] Pilevych, D. (2020). Transformation of the accounting system in the conditions of digital technologies development. *Problems and Prospects of Economics and Management,* 3(23): 149–157. Available at: http://ppeu.stu.cn.ua/article/view/224553 (in Ukrainian).

[23] Pravdiuk, N., Obniavko, M., and Vasylyna, A. (2022). Implementation of innovative technologies in the accounting system: Global experience and prospects of Ukraine. *Efektyvna Ekonomika,* 11: 32-54. DOI:http://doi.org/10.32702/2307-2105.2022.11.8 (in Ukrainian).

[24] Rane, N. (2023). Role and challenges of ChatGPT and similar generative artificial intelligence in finance and accounting. Available at: *https://ssrn.com/abstract=4603206* DOI: https://dx.doi.org/10.2139/ssrn.4603206

[25] Riinawati, R. (2021). The development of information technology and its influence on the field of management accounting. *Journal of Financial and Tax, 1*(2): 131–149.

[26] Savkiv, U. S., and Kuzmin, T. L. (2023). Improving accounting and reporting in the digital economy. *The Actual Problems of Regional Economy Development. 19*(2): 87-95. (in Ukrainian).

[27] Smiesova, V., Pylypenko, A., Ivanova, M., and Karpenko, R. (2019). Economic and institutional conditions for the implementation of economic interests in the countries of the world. *Montenegrin Journal of Economics*, *15*(4), 75-86. DOI: http://doi.org/10.14254/1800-5845/2019.15-4.6

[28] Sunardi, N., Husain, T., and Kadim, A. (2020). Determinants of debt policy and company's performance. *International Journal of Economics and Business Administration, 8*(4): 204-213. Available at: https://ijeba.com/journal/580

[29] Thapa, C., and Camtepe, S. (2021). Precision health data: Requirements, challenges and existing techniques for data security and privacy. *Computers in Biology and Medicine*, *129*: 104130. DOI:https://doi.org/10.1016/j.compbiomed.2020.104130

[30] Vărzaru, A. A. (2022). Assessing artificial intelligence technology acceptance in managerial accounting. *Electronics*, *11*(14): 2256. DOI: https://doi.org/10.3390/electronics11142256

[31] Wang, A., Guo, S., and Li, Ruixue. (2022). Artificial intelligence technology enables the development of management accounting: The generation of Intelligent Accounting. Paper presented on the 3rd Asia Service Sciences and Software Engineering Conference, February 24-26, in Macau Macao, China. DOI:https://dx.doi.org/10.1145/3523181.3523190

[32] Xu, X., Yang, Z., and Zhou, W. (2021). Research on intelligent accounting system based on management activity theory – from accounting informatization to accounting intelligence. *Accounting Research,* 3: 11–27. DOI: https://doi.org/10.1109/ACCESS.2023.3333389

[33] Zaporozhets, T. V. (2020). Intelligent management system: Theoretical construction approaches. *Public management and administration in Ukraine,* 15: 46-52. DOI: https://doi.org/10.32843/2663-5240- 2020-15-9 (in Ukrainian).

[34] Zhang, C., Abigail, Cho, Soohyun, and Vasarhelyi, M. (2022). Explainable artificial intelligence (xai) in auditing. *International Journal of Accounting Information Systems*, *46*: 100572. DOI:https://doi.org/10.1016/j.accinf.2022.100572

[35] Zhylin, M., *et al.* (2024). Analysis of contemporary methods of integrating emotional intelligence into artificial intelligence systems: Advantages, disadvantages, and perspectives. *Journal of Theoretical and Applied Information Technology, 102*(7): 2842–2853.

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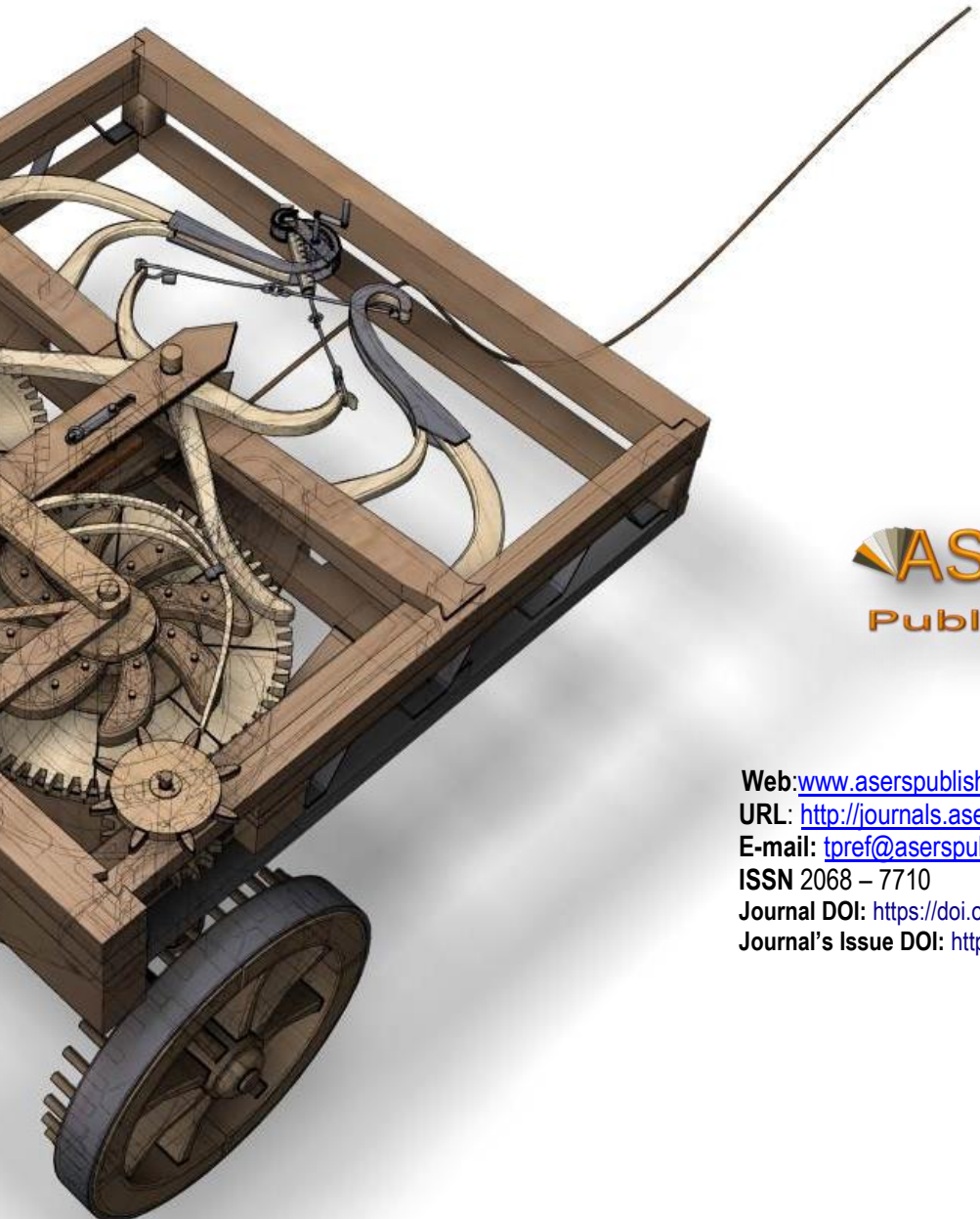

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