

-RESEARCH ARTICLE-

DIGITAL ACCOUNTING TRANSFORMATION AND FIRM PERFORMANCE: CLOUD COMPUTING AS A MODERATING ROLE IN COMMERCIAL BANKS

Basel J. A. Ali

Department of Economics, College of Economics and Management, Al Qasimia University, Sharjah, United Arab Emirates

ORCID: <https://orcid.org/0000-0001-6259-2062>

Email: bali@alqasimia.ac.ae

Ali M. Alrabei

Department of Accounting, School of Business, Jadara University, Irbid, Jordan

ORCID: <https://orcid.org/0000-0002-5217-1982>

Email: aalrabei@jadara.edu.jo

Leqaa naife Al-Othman

Financial & Administrative Sciences Department, Al-Huson University College, Al-Balqa Applied University

ORCID: <https://orcid.org/0000-0001-6184-693X>

Email: Leqaa.n.a@bau.edu.jo

Ruaa Binsaddig

Department of Finance, College of Business Administration, University of Business and Technology, Jeddah, Saudi Arabia

ORCID: <https://orcid.org/0000-0002-8436-7218>

Email: r.binsaddig@ubt.edu.sa

Citation (APA): Ali, B. J., Alrabei, A. M., Al-Othman, L. N., Binsaddig, R., Al Fahmawee, F. A. D. (2025). Digital Accounting Transformation and Firm Performance: Cloud Computing as A Moderating Role in Commercial Banks. *International Journal of Economics and Finance Studies*, 17(04), 242-262. doi: 10.34109/ijefs.202517411

Emad Al Dein Al Fahmawee

Department of Interior Design, Faculty of Art and Design,
Applied Science Private University
ORCID: <https://orcid.org/0000-0002-5158-8882>
Email: e_fahmawee@asu.edu.jo

Abstract-

In the age of digital economy, banks have resorted to utilizing digital accounting as its competitive advantage. This paper examined the impact of digital accounting transformation (Artificial Intelligence (AI), Big Data (BD), Blockchain (BC) and E-commerce (EC)) on firm performance, moderated by cloud computing (CC). Questionnaires were distributed to 500 directors s selected from 14 commercial banks in Jordan to obtain data. Results showed significance of Artificial Intelligence, Big Data, Blockchain and EC in increasing bank performance, and that performance increase was facilitated by organizational culture through E-commerce interaction. This study presented a theoretical research model that combines the adoptions of digital accounting, Artificial Intelligence, Big Data, Blockchain and E-commerce and bank performance in Jordan, under the digital transformation revolution. The study findings provide valuable insights to policymakers in guiding commercial banks in digital technologies adoption to improve performance.

Keywords: Digital Accounting; Artificial Intelligence; Big Data; Blockchain; E-commerce; firm performance; cloud computing

INTRODUCTION

Today, digital transformation is fast spreading, and digital technologies are progressing at a fast pace. For companies and industries, this means that digital technologies are increasingly inevitable for their survival in today's digital era (Tajudeen et al., 2025). Digital transformation involves (among others) prompt response to the challenges resulting from modern digital technologies (Daouk, 2025). It also involves exploitation of opportunities created by technological revolutions, and in the context of banking, the exploitation of such opportunities improves financial performance (Salhab et al., 2023). Notably, digital transformations are part of the digital trends, and in gaining the full benefits of digital change, companies need to accordingly change their practices and tools to accommodate the needs of the digital trends (BinSaeed et al., 2023).

The business environment has undergone radical and inclusive change following the massive digital revolution in the Internet and communications networks (Alqaraleh et

al., 2022). For companies, they need to keep abreast with such massive developments to assure their survival in various areas including in their accounting and management information systems, that is, they need to shift from the use of traditional methods to the modern digital methods (Hatamlah et al., 2023; Shan et al., 2022). The information systems in this context encompass programs resulting from the emergence of digital entities (Endres, et al, 2022). This has led to the emergence of new business behavior pattern resulting from the standards that allow each company to select the most fitting technologies for its work nature, as can be exemplified by Cybersecurity, AI, CC, BC Technologies, Internet of Things, and BD (Mahmood, et al ,2024). For company's work in accounting information system, the use of such technologies offers several benefits such as increased transparency, reduced cost, effort and time saving, easier access, better data protection, and more efficient work (Oncioiu et al., 2019; Salih omar et al, 2024). For commercial banks, the level of digital transformation implementation and practice in their accounting process improves the accounting information systems quality, and consequently, the company performance (Balicka, 2023).

Like other domains, banking also has undergone rapid digital technology innovations with commercial banking being the most prominent result (Oudat, 2021; Shan et al., 2022). In fact, the domain of banking is among the first being affected by such innovations. Within the context of accounting, the availability of modern techniques could significantly enhance the overall performance, with the incorporation of innovative technologies like AI, BD, BC and EC in Accounting Digital platform. However, CC environment is required to successfully run these technologies. The present study therefore examines the impact of the digital accounting transformation (AI, BD, BC and EC) on firm performance (FP) in commercial banks, moderated by CC.

LITERATURE REVIEW

Digital Transformation

The current technological developments occurring in various domains have affected many. This era is known as the era of digitalization, which has prompted many business organizations to resort to digital transformation in order to remain relevant (Tajudeen et al., 2025). In this digital era, the advancements and emergence of innovative technologies such as AI, CC BC Technologies, Internet of Things, and BD have affected businesses in their various aspects including their accounting practices, and consequently, their overall performance. Now, the implementation of digital economy can be observed occurring in various sectors including the sector of health, education, energy, finance and financial technology (fintech), security and communications. Indeed, companies seeking to accomplish their goals need to undergo digital Transformation. Digital transformation has become a subject of

interest among company managers (Nazara et al., 2024; Zimonjić, 2024). Most studies on digital transformation have explored the subject as a concept, examining its process of adoption, but there were also studies that examined the impact of digital transformation on FP (Guo & Xu, 2021; Masoud & Basahel, 2023; Zhao et al., 2024). Additionally, Yang et al. (2023) included EC as the dimension of digital accounting transformation because according to them, EC causes the increase in trading rates, because EC facilitates in the expansion of internal and external trade.

Furthermore, the fulfilment of EC requirement affects the EC use, and EC use is increased by web security (Kumar et al., 2023). In another study involving Jordanian banks, Haddad (2021) examined the use of AI as part of digital transformation and reported the ability of AI in improving data accuracy and more efficient basic reports creations. The other dimension of digital transformation is BC, which entails a technology that offers a free open general ledger for user to register ownership of countless types of properties including shares, securities, real estate, vehicles, artwork, lavish handbags and so forth (Freeman, 2022).

BC also has been used for storing public records including birth certificates, driving licenses, as well as university degrees (Eddy, et al ,2024). El Midaoui et al. (2021) stated that a real BC network can be assigned through a tracking device (GPS), represented using a colored coin or token. Financial and non-financial assets (e.g., currencies, tangible assets, and intangible assets) are given certain symbol.

BD, also a dimension of digital transformation in this study, is increasingly being used in the accounting domain. For enterprises, among their goals of using BD in their digital transformation is to make their digital accounting more secure (Jawabreh et al., 2024). The digital accounting system employs the network, the channel through which numerous types of financial BD are transmitted (Jawabreh et al., 2024). Additionally, during development, digital accounting software developers protect their products, use encryption where the development software would be encrypted, and neglect the encryption of the data transmitted in digital accounting (Lu, 2022; Salhab et al., 2023).

Cloud Computing (CC)

(CC) technology is a technology that offers large processing space and storage capacities, in addition to large communication servers (Ahmed, et al 2026). This technology is very useful to companies, particularly SMEs (small and medium enterprises) as it facilitates them in gaining potent and effective resources that they otherwise could not afford (Mujalli et al., 2024). This technology is useful to large companies as well, as it allows these companies to effectively operate through its large processor space, and store data in large amount through its large storage capacities (Alnaimat et al., 2024). It allows companies to communicate effectively and

efficiently through its vast communication servers. Owing to the capacities of CC, companies can effectively and efficiently operate without restrictions, and companies no longer need to increase their equipment and facilities to improve their operation (Alnaimat et al., 2024). CC provides opportunities to companies in achieving numerous financial and administrative advantages (VoVan et al., 2024). In the context of accounting, the use of CC makes accounting information systems more efficient, as the systems become easier to be implemented (VoVan et al., 2024). CC also makes accounting information systems more flexible, scalable and measurable, and through its large capacity of storage (among the advantages of CC), CC makes accounting work more efficient (Moudud-Ul-Huq et al., 2020).

In Saudi Arabia, Al-Ruithe et al. (2018) reported that the use of CC, especially in public sectors, has been rather sparse (Jaradat et al., 2024). This implies the need to establish an all-inclusive framework for digital transformation programs for companies in this sector. Kumar et al. (2023) aptly discussed the use of CC as a technique of digital transformation as replacement to the traditional information systems. In another related study, Moudud-Ul-Huq et al. (2020) found that CC significantly improve the accounting profession. Hence, for technology sector organizations, the investment on CC implementation is expected to increase. In fact, owing to the benefits offered by CC to organizations, many organizations today have become obliged to utilize this technology (Mujalli et al., 2024).

literature Review and Hypotheses Development

The digital accounting adoption and technological competition through EC have become the key drivers for FP improvement (Al-Okaily et al., 2023). In the services sector in Saudi Arabia. Masoud and Basahel (2023) accordingly reported positive impact of digital transformation on the performance of firms. Additionally, within the context of Jordanian banks, Al-Khasawneh (2022) found a high-impact relationship between the use of technologies (Internet of Things, BD, BC, and Robot) in banking transactions and the implemented accounting systems. Wang et al. (2022) pertinently added that digital transformations that enhance internal controls, green innovation and total factor productivity, can reduce pollution emissions. Despite the benefits of digital transformations, Jara et al. (2024) reported low knowledge on this subject. Ji et al. (2025) found high significant effect of EC on FP in china. Li et al. (2024) found business EC influence significantly firm industrial FP. Therefore, the following hypothesis was developed:

H1: Digital accounting transformation through EC significantly affects the commercial banks' performance:

Al-Okaily et al. (2023) reported digital accounting adoption, financial technology innovations adoption and technological competition as the key drivers for business

performance improvement. Contrariwise, [Jawabreh et al., 2024](#)) reported no correlation and impact relationship between the digital transformation of banking operations and strategic financial performance. In the services sector in Saudi Arabia, a positive impact of digital transformation on FP was reported by ([Masoud & Basahel, 2023](#)). Study found high-impact relationship of usage of technologies (AI -Robot) in banking transactions and the accounting systems was reported by ([Al-Khasawneh, 2022](#)). ([Giachino et al., 2025](#)) indicates that AI-driven decision-making is significantly associated with company performance, and that AI sup-ported by BD positively impacts decision-making. Consequently, the following hypothesis was developed:

H2: Digital accounting transformation through AI significantly affects the Jordanian commercial banks 's performance:

Among Jordanian banks, [Al Shanti and Elessa \(2023\)](#) reported that BC implementation has resulted in more effective corporate governance. Additionally, in the services sector in Saudi Arabia, a positive impact of digital transformation on FP was reported by ([Masoud & Basahel, 2023](#)). Relevantly, in Jordanian banks, a high-impact relationship of usage of technologies (BC) in banking transactions and the accounting systems was reported by ([Al-Khasawneh, 2022](#)). In addition [Mohapatra, et al \(2025\)](#) confirmed that BC significantly effect FP. Therefore, we develop the following hypothesis:

H3: Digital accounting transformation through BC significantly affects the Jordanian commercial banks 's performance.

The use of BD, CC may improve business performance ([Jawabreh et al., 2024](#)). Specifically, the accounting business' fast reception of CC and BD, as well as the jobs that these advances played inside accounting firms, is the focal point of this review. Examining Jordanian banks, [Al-Khasawneh \(2022\)](#) reported a high-effect connection between usage BD in banking transactions and the implemented accounting systems. In addition, [Giachino et al. \(2025\)](#) found that AI supported by BD positively impacts FP and decision-making. Therefore, we developed the next hypothesis

H4: Digital accounting transformation through BD significantly affects the Jordanian commercial banks' performance.

[Castellar et al. \(2021\)](#) found that in the extant literature, some of the key aspects of digital transformation of firm have not been sufficiently examined. For instance, the implementation of CC (IT) architecture of old and new technologies has not been adequately explored. Within the context of Jordan, [Alrawashedh and Shubita \(2024\)](#) showed that digital transformation substantially enhances the client experience and innovation in IT. The findings further validate that digital transformation exerts a substantial positive impact on organizational performance. Furthermore, the substantial positive influence of client experience and innovation in IT was validated.

Additionally, in examining banks, [Fabian, et al \(2021\)](#) found no connection or impact between digital transformation and performance of banks, financially. There-fore, the study wants to add a variable that may enhance the relationship, namely the CC, as a moderating variable between AI, EC, BC, BD, and FP. Therefore, the study developed the following hypostasizes.

H5: There is significant relationship between CC and FP:

H6: CC moderates the relationship between AI and FP:

H7: CC moderates the relationship between EC and FP:

H8: CC moderates the relationship between BC and FP:

H9: CC moderates the relationship between BD and FP:

METHODOLOGY

A research design outlines the methods to be employed in collecting and analyzing the study data. In this study, the instruments used include latest version of SPSS 30 and SmartPLS -4.1 these were used in the formation of statistical analysis and model estimation. Data were collected using structured questionnaire survey and the selected 500 study respondents were directors from fourteen commercial banks in Jordan. A total of seven (7) sections were included in the questionnaire, the first for to demographics items, second to IVs which is Elements of Digital Accounting Transformation (AI, BD, BC and EC), the fifth section for dependent variable of the study (FP), and the last to moderator variables (cloud computing). Specifically, items in section One were on the demographic profile of the respondents, while items in sections two through seven were on the constructs covered in this study namely AI, BD, BC, EC, CC and FP.

The questionnaire items were based on ([Jawabreh et al., \(2024& Salhab et al., \(2023\)](#) but were adapted to correspond with the objectives of the study. In order to facilitate the respondents in providing responses and facilitate construct evaluation, each item in sections 2 through 7 was equipped with five-point Likert scale for

Cleaning data, Reliability including factor loading, outer model, validity, composite reliability and R square, structure model were performed to facilitate data interpretation, and frequencies were used to rank the data. Consistency was determined based on correlation among items, through the computation of Cronbach's alpha, whereby alpha value of 0.7–0.9 would signify consistency, but as stated by [Hair Jr, \(2021\) & Hair Jr et al., \(2023\)](#), Cronbach's alpha is not a test, but it assures that the items effectively measure a shared concept.

Framework of the study

The study's theoretical framework is as illustrated in the following [Figure 1](#). The study assumptions or hypotheses were constructed in this study, and were tested using a theoretical framework as shown in [Figure 1](#). Specifically, the framework was to

investigate the Effect of AI, BD, BC and EC on FP, with CC as moderator.

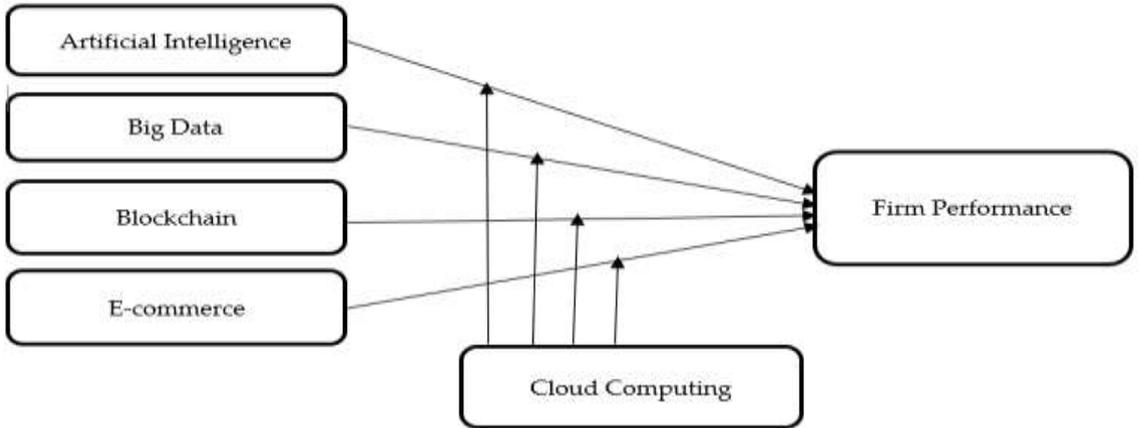


Figure 1: Theoretical Framework

Instrument Variables research:

The questionnaire items comprised a series of statements equipped with 5-point Likert scales. For each statement, the respondents would choose their level of agreement as provided by the seven Likert Scale. The questionnaire items which are presented in [Table 1](#), were to examine the effect of AI, BD, BC and EC on FP, with CC as moderator in the next [Table 1](#).

Table1: Study Items

Variables of the study	Indicators
Artificial Intelligence (AI)	<ol style="list-style-type: none"> 1. AI allows the processing of events and accounting at Bank Sector 2. AI facilitates managerial accountants in making decisions. 3. AI facilitates commercial banks managers to make effective decisions to successfully achieve their goals. 4. AI facilitates accountants to effectively make decisions in their accounting database designs. 5. AI facilitates accountants to effectively make decisions to resolve the accounting related problems.
Big Data (BD)	<ol style="list-style-type: none"> 6. BD is increasingly important because it allows social communication through the Internet. 7. BD facilitates companies in obtaining substantial access to customer data through private and open sources, and in verifying extra data sources like pump data and network connections. 8. BD enables analysis and integration of parts of information spread within numerous databases for form an image of notable person or event. 9. BD facilitates the formation or increment of company profits, because companies that utilize BD in decision making gain more profits than those that don't. 10. BD is utilized by large and small companies and by finance and insurance

	companies in risk analysis and fraud detection.
Blockchain (BC)	<ol style="list-style-type: none"> 11. Using BC technology, transaction contracts can be executed without supervision. 12. The integration of BC technology in the accounting sector increases the autonomy of the accountant's work. 13. BC technology allows the sharing of ledger database and full traceability, while also assuring transparency and reliability. 14. Using BC technology helps increase the security level, while retaining the data as is. 15. BC technology data is available to all relevant parties, and the information presented by BC is fully transparent.
E-commerce (EC)	<ol style="list-style-type: none"> 16. The global technological development has led to the increase in EC usage in commercial banks. 17. The global technological development has led to the increase in EC usage in merchandising firms. 18. EC is the major instrument employed by the commercial banks in financing export operations. 19. Firms operate in adherence to the Customs and Unified Assets Bulletin No. 600 issued by the International Chamber of Commerce in Paris in 2007. 20. Firms believe that despite the non-existence of the details on the consolidated assets and customs, the international standards for banking practices related to the examination of documents (ISBP) do exist.
Cloud Computing (CC)	<ol style="list-style-type: none"> 21. CC drives the accomplishment of important technological developments, like mobile computing and BD. 22. CC drives the accomplishment of important technological developments like AI. 23. CC facilitates businesses and governments in dealing with certain challenges like digital transformation and commercial transformation. 24. CC facilitates businesses and governments in dealing with social challenges, like healthcare, the environment, and education. 25. Ability to behave, innovation and low cost are the characteristics of CC. 26. Using CC, anyone with no knowledge or experience can still obtain IT access through the Internet from anywhere and at any time.
Firm Performance (FP)	<ol style="list-style-type: none"> 27. Board of Directors is the vital body in the selection of executives in improving the performance of the company. 28. Board of Directors is the body that establishes the goals and strategies and strives to achieve them for the survival of the company. 29. The Audit Committee initiates governance and improves the performance of company by supervising the company's preparation of financial reports and financial statements. 30. The provision of a clear, written internal company system on rewards and promotion policies will improve company performance. 31. The issuance of clearly defined objectives and the internal audit department tasks based on a scrutiny of the risks facing the company, will increase company performance. 32. The external auditor improves company performance by promptly disclosing areas of weakness and faults inside the company.

RESULTS AND EMPIRICAL FINDING BY SMART PLS:

The Outer Model of Measurement

The evaluation of measurement or outer model is the first step in PLS, utilizing four criteria proposed by (Hair Jr, 2021a; Hair Jr et al., 2023). Reliability of indicators is affirmed with the loadings of 0.70, while internal consistency is confirmed if the achieved composite reliability (CR) is 0.70 or Higher than 0.070) (Hair Jr et al., 2023). Average variance extracted (AVE) of 0.50 or higher denotes convergent validity, and if AVE of each latent component is higher than the highest squared correlation of that factor with any other latent factor, then, the discriminant validity can be affirmed (Henseler et al., 2015). Also, Hair Jr (2022) mentioned that each construct's AVE square root must be greater than the correlations of the construct with other latent constructs. The hetero-trait-monotrait (HTMT) ratio, the Fornell correlation matrix method and the cross-loading approach are among the commonly used methods in evaluating the discriminant validity. And among of those approaches, the HTMT ratio has been the most commonly used owing to its specificity and sensitivity in detecting the issues associated with discriminant validity (Henseler et al., 2015). As can be seen in Tables 2–5, the obtained results are all within the acceptable values according to above mentions citations. Therefore, the structural model can be assessed without risk.

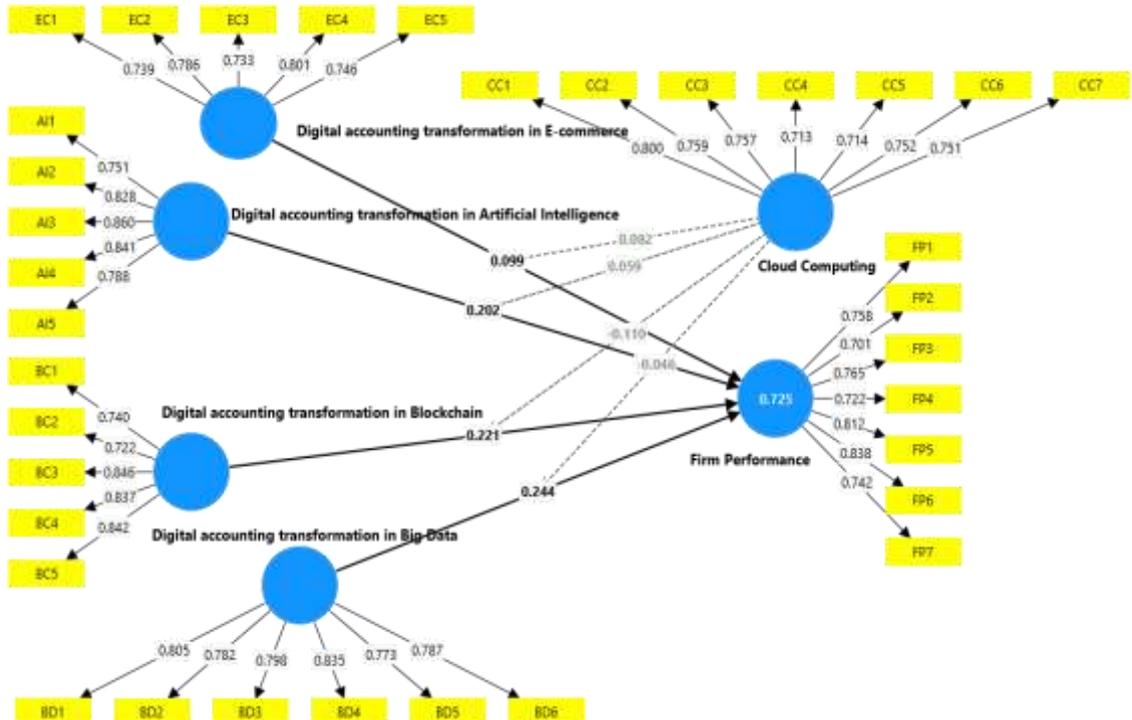


Fig 2: Outer Model

Table 2: Construct reliability and validity from the reflected measurement model

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Cloud Computing	0.870	0.872	0.900	0.562
Digital Accounting Transformation through Artificial Intelligence	0.873	0.877	0.908	0.663
Digital Accounting Transformation through Big Data	0.885	0.887	0.912	0.635
Digital Accounting Transformation through Blockchain	0.858	0.865	0.898	0.639
Digital Accounting Transformation through E-Commerce	0.823	0.834	0.873	0.580
Firm Performance	0.881	0.885	0.907	0.583

Table 3: Outer loadings of items

	CC	AI	BD	BC	EC	FP
AI1		0.751				
AI2		0.828				
AI3		0.860				
AI4		0.841				
AI5		0.788				
BC1				0.740		
BC2				0.722		
BC3				0.846		
BC4				0.837		
BC5				0.842		
BD1			0.805			
BD2			0.782			
BD3			0.798			
BD4			0.835			
BD5			0.773			
BD6			0.787			
CC1	0.800					
CC2	0.759					
CC3	0.757					
CC4	0.713					
CC5	0.714					
CC6	0.752					
CC7	0.751					
EC1					0.739	
EC2					0.786	
EC3					0.733	
EC4					0.801	
EC5					0.746	
FP1						0.758
FP2						0.701

FP3										0.765
FP4										0.722
FP5										0.812
FP6										0.838
FP7										0.742

Table 4: Heterotrait-monotrait ratio (HTMT) – Matrix

	CC	AI	BD	BC	EC	FP	CC x AI	CC x EC	CC x BC
CC									
AI	0.877								
BD	0.707	0.734							
BC	0.869	0.877	0.765						
EC	0.167	0.146	0.188	0.130					
FP	0.825	0.837	0.795	0.869	0.235				
CC x AI	0.282	0.397	0.274	0.320	0.155	0.340			
CC x EC	0.164	0.194	0.101	0.208	0.041	0.228	0.071		
CC x BC	0.270	0.338	0.275	0.390	0.183	0.372	0.869	0.085	
CC x BD	0.249	0.323	0.428	0.309	0.096	0.366	0.695	0.216	0.727

Table 5: Fornell-Larcker criterion

	CC	AI	BD	BC	EC	FP
CC	0.750					
AI	0.767	0.814				
BD	0.623	0.651	0.797			
BC	0.750	0.759	0.670	0.800		
EC	0.144	0.120	0.164	0.117	0.762	
FP	0.729	0.744	0.713	0.764	0.204	0.764

Structural Model Analysis

PLS bootstrapping was used in this study, in examining the conjectured relationships, and such examination was carried out in the last stage of PLS SEM model analysis. Path coefficients are usually evaluated in PLS analysis. In this regard, (Hair Jr, 2021b) stated that the initial hypotheses should be rejected if the paths are insignificant or show opposing trends. Conversely, when significant paths follow the anticipated direction, the proposed causal relationship is supported. Evaluations of path coefficients should involve the use of a bootstrap with a sample size of 5,000 at minimum, with number of cases and observations in the sample in similar number (Hair Jr, 2021b). This study used 5,000 resampling iterations, with bootstrap cases and the initial sample size of corresponding number (500). This was to introduce moderate errors and create t-values. In this study, the analysis of structural paths employed results and values of standardized path coefficients in hypotheses testing, as shown in Table 6 and Figure 3.

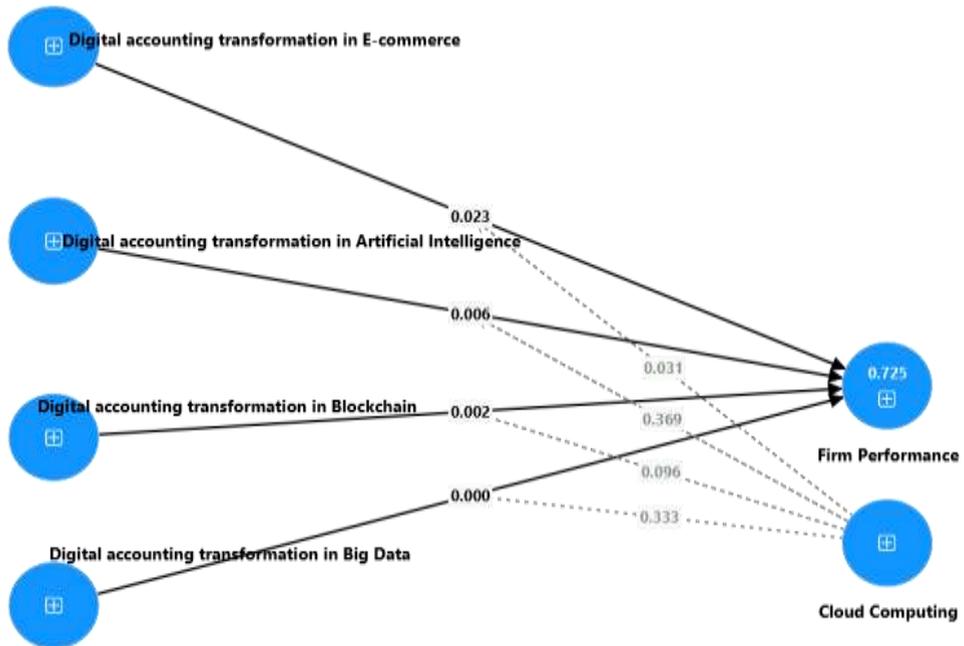


Figure 3: Investigating Structural Models

6: Outcome of hypotheses

Hypothesis Results	Original Sample (O)	Sample Mean (M)	(STDEV)	T Statistics	P Values
Cloud Computing -> Firm Performance	0.198	0.201	0.067	2.967	0.003
Artificial Intelligence -> Firm Performance	0.202	0.199	0.073	2.762	0.006
Digital Accounting Transformation in Big Data -> Firm Performance	0.244	0.245	0.057	4.317	0.000
Blockchain -> Firm Performance	0.221	0.222	0.070	3.138	0.002
E-Commerce -> Firm Performance	0.099	0.104	0.044	2.270	0.023
Cloud Computing x Artificial Intelligence -> Firm Performance	0.059	0.051	0.066	0.898	0.369
Cloud Computing x E-Commerce -> Firm Performance	0.082	0.078	0.038	2.158	0.031
Cloud Computing x Blockchain -> Firm Performance	-0.110	-0.104	0.066	1.665	0.096
Cloud Computing x Big Data -> Firm Performance	-0.046	-0.043	0.047	0.967	0.333

RESEARCH FINDINGS

Results of Smart PLS analysis proved the existence of interrelationships on the effect of the four independent variables (AI, BD, BC and EC) on FP, with CC as moderator, in commercial banks in Jordan. Coefficient results for hypotheses testing are displayed in the following Table 6.

H1: *There is significant relationship between E-commerce and FP:*

Results show positive impact of EC on FP, but unlike other technologies, the impact of this technology is somewhat smaller at moderate level (T-statistic = 2.270; P-value = 0.023). The result shows that adoption of EC will improve performance, but the effect of adopting this technology is less dramatic. This result consistent with (Ji et al., 2025; Li et al., 2024).

H2: *There is significant relationship between AI and FP:*

Results show significant positive impact of AI on FP (T-statistic = 2.762; P-value = 0.006). With low P-value, the strong role of AI in improving FP, with statistical significance in the relationship, can be affirmed. This result agreed with (Giachino et al., 2025).

H3: *There is significant relationship between BD and FP:*

Results show significant impact of BD on FP (T-statistic = 4.317; P-value = 0.000). This shows that the use of BD among firms leads to significant performance improvement. This result is agreed with (Giachino et al., 2025).

H4: *There is significant relationship between BC and FP:*

Results show that BC and FP is significantly associated (T-statistic = 3.138; P-value = 0.002), meaning that, BC technology use can increase FP. This result consistent with (Mohapatra & Rakshit, 2025).

H5: *There is significant relationship between CC and FP:*

Results show that CC increases FP significantly (T-statistic = 2.967; P-value = 0.003). With P-value of lower than 0.05, a positive impact of CC on how well a firm performs, can be concluded.

H6: *CC moderates the relationship between AI and FP:*

Results show that the interaction between CC and AI does not have significant impact on FP (T-statistic = 0.898; P-value = 0.369). In other words, the interaction is not significant statistically. Results imply that CC and AI are well functioning on their own, and that their combined effect does not significantly increase FP.

H7: *CC moderates the relationship between E-commerce and FP:*

Results show positive and significant impact of CC being combined with EC on FP (T-statistic = 2.158; P-value = 0.031). This means that combining these two technologies can improve FP.

H8: *CC moderates the relationship between BC and FP:*

Results show that the interaction between CC and BC displays a positive but insignificant effect on FP (T-statistic = 1.665; P-value = 0.096), implying a potential influence of both technologies on FP, but this relationship needs to be scrutinized more to confirm it.

H9: *CC moderates the relationship between BD and FP:*

Results show that the interaction between CC and BD has no significant impact on FP (T-statistic = 0.967; P-value = 0.333). This means that both technologies when combined, has no significant effect on FP.

Table 6: R-Squared values

	R-Square	R-Square Adjusted
Firm Performance	0.725	0.714

R-squared value results are displayed in [Table 6](#). As shown, the ratio achieved was 0.725, which means that 72.5% of variation in FP is attributable to the variables in the research model. It therefore shows all the variables effect form performance by 72%. [Table 6](#) also shows that the adjusted R value achieved was 0.714 which is a little lower in comparison to the R value. This adjusted R value considers the prediction error made through the inclusion of more predictors than in control variables. Hence, the model can explain a part of variability in performance across firms.

STUDY IMPLICATIONS

The findings of this study are of value both in theory and in practice. In theory, the findings show the impact of innovative technologies (e.g., CC, AI, BD, BC and EC) on FP, in commercial and Islamic banks in kingdom of Jordan. In practice, the findings are empirical proof that adopting technology-based approaches improve FP. This affirms the impact of information communication and technological tools on bank performance. In addition, If the commercial banks in Jordan, the use effectively technologies such as BD, CC and BC, could enhance performance. Also, in order to achieve superior performance, banks should consider using some technologies separately or in grouping. Therefore, banks may consider combining CC and EC to improve FP. Lastly, the study results could help banks in formulating their planned decisions, technology use and investment planning to increase operational competence and competitiveness.

CONCLUSIONS, CONSTRAINTS, AND SUGGESTIONS FOR FURTHER INVESTIGATION

This study reveals that technologies like CC, AI, BD, BC, and EC significantly affect performance improvement of commercial and Islamic banks in the kingdom of Jordan. Obviously, the results show good potential of these technologies in facilitating banks in streamlining their processes, and in improving their decision-making and their overall efficiency. Results show that some of these technologies, when implemented together, will enhance performance, while combination of some technologies may not lead to additional performance improvements. In specific, this study showed that the combination of CC and EC increases FP, while the combination of CC and AI or BD did not affect FP as much. Therefore, Commercial banks in Jordan need to consider all findings in formulating their technology approaches to achieve the maximum benefits.

Also, this study has some limitations. Firstly, this study was only focusing on commercial and Islamic banks in kingdom of Jordan, and so, the findings may not be relevant to other sectors or industries or banks in other nations. It should also be noted that the environments of banking may vary from one area to the next. Also, technologies may affect FP differently, and also to other variables such as local market conditions, culture, regulations. Also, this study did not consider internal factors inside the commercial banks that may also affect the successful adoption of these technologies.

Based on the limitations mentioned in this study and previous studies, this study proposes the following, Firstly, this study proposes examining the impact of these technologies on firms in other sectors, industries and countries, in order to increase generalizability of the findings. In Addition, examine other internal factors or dominations such as Innovation, infrastructure, and institutional support and adoption of these technologies may be examined in future studies. This may increase the understanding of the challenges and opportunities that may appear during the implementation of these technologies, within the con-text of banks and other organizations.

REFERENCES

- Abdulrahman, M. S. A., Khder, M. A., Ali, B. J., & Fujo, S. W. (2022). How can blockchain revolutionize the health sector during Health Pandemics (Covid-19) in Kingdom of Bahrain. 2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS), <https://doi.org/10.1109/ICETSIS55481.2022.9888924>

- Abu-AlSondos, I. A., Alkhwaldi, A. F., Shehadeh, M., Ali, B. J. A., & Al Nasar, M. R. (2023). The Role of Industry 4.0 Technologies in Enabling Knowledge Management Practices: United Arab Emirates Perspective. *Global Economic Revolutions: Big Data Governance and Business Analytics for Sustainability*, Cham. https://doi.org/10.1007/978-3-031-50518-8_12
- Al-Khasawneh, R. (2022). Impact of digital technologies on banking accounting systems in Jordanian banks *Journal of Entrepreneurship Education*, 25(3), 1-16. <https://www.abacademies.org/articles/impact-of-digital-technologies-on-banking-accounting-systems-in-jordanian-banks-14741.html>
- Al-Okaily, M., Alsmadi, A. A., Alrawashdeh, N., Al-Okaily, A., Oroud, Y., & Al-Gasaymeh, A. S. (2023). The role of digital accounting transformation in the banking industry sector: an integrated model. *Journal of Financial Reporting and Accounting*, 22(2), 308-326. <https://doi.org/10.1108/JFRA-04-2023-0214>
- Al Shanti, A. M., & Elessa, M. S. (2023). The impact of digital transformation towards blockchain technology application in banks to improve accounting information quality and corporate governance effectiveness. *Cogent Economics & Finance*, 11(1), 2161773. <https://doi.org/10.1080/23322039.2022.2161773>
- Alawadhi, J., AlJanabi, A. M., Khder, M. A., Ali, B. J., & Al-Shalabi, R. F. (2022). Internet of Things (IoT) security risks: Challenges for business. 2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETISIS), <https://doi.org/10.1109/ICETISIS55481.2022.9888930>
- Aldulaimi, S. H., Ali, B. J., Yas, Q. M., Abdeldayem, M. M., Aswad, A. R., & Hammad, A. M. (2022). Application of big data analysis to foresight the future: A review of opportunities, approaches, and new research directions. 2022 ASU international conference in emerging technologies for sustainability and intelligent systems (ICETISIS), <https://doi.org/10.1109/ICETISIS55481.2022.9888841>
- Alnaimat, M. A., Kharit, O., Mykhailenko, I., Palchuk, I., & Purhani, S. (2024). Implementation of cloud computing in the digital accounting system of logistics companies. *Acta Logistica*, 11(1), 99-109. <https://doi.org/10.22306/al.v11i1.461>
- Alqaraleh, M. H., & Oudat, M. S. (2022). The mediating role of organizational culture on the relationship between information technology and internal audit effectiveness. *Corporate Governance and Organizational Behavior Review*, 6(1), 10.22495. <https://doi.org/10.22495/cgobrv6i1p1>
- Alrabei, A. M. (2023). Green electronic auditing and accounting information reliability in the Jordanian social security corporation: the mediating role of cloud computing. *International Journal of Financial Studies*, 11(3), 114. <https://doi.org/10.3390/ijfs11030114>

- Alrabei, A. M. (2023). The mediating effect of COVID 19—pandemic on the Nexus between accounting information systems reliability and e-commerce: from the perception of documentary credit employees. *Information Sciences Letters*, 12(8), 2867-2876. <https://doi.org/10.18576/isl/120835>
- Alrawashedh, N. H., & Shubita, M. F. (2024). Impact of digital transformation on the organization's financial performance: A case of Jordanian commercial banks listed on the Amman Stock Exchange. *Banks and Bank Systems*, 19(1), 126. [https://doi.org/10.21511/bbs.19\(1\).2024.11](https://doi.org/10.21511/bbs.19(1).2024.11)
- Atta, A. A. B., Baniata, H. M., Othman, O. H., Ali, B. J., Abughaush, S. W., Aljundi, N. A., & Ahmad, A. Y. B. (2024). The impact of computer assisted auditing techniques in the audit process: an assessment of performance and effort expectancy. *International Journal of Data & Network Science*, 8(2). https://www.growingscience.com/ijds/Vol8/ijdns_2023_234.pdf
- Balicka, H. (2023). Digital technologies in the accounting information system supporting decision-making processes. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*. (169). <https://doi.org/10.29119/1641-3466.2023.169.4>
- BinSaeed, R. H., Yousaf, Z., Grigorescu, A., Radu, V., & Nassani, A. A. (2023). Digital revolution and digitization process to promote AIS as a vector of financial performance. *Systems*, 11(7), 339. <https://doi.org/10.3390/systems11070339>
- Castellar, G. B., Querido, M. F. R., & de Souza Meirelles, F. (2021). To the top: the impact of digital transformation on the market value of Magazine Luiza. *International Journal of Innovation*, 9(3), 439-473. <https://doi.org/10.5585/iji.v9i3.18621>
- Daouk, A. (2025). Navigating the digital transformation landscape: Education, opportunities, and challenges for entrepreneurs. *Entrepreneurship—digital transformation, education, opportunities and challenges*, 113. <https://books.google.com.pk/books?id=tghEEQAAQBAJ&printsec=frontcover#v=onepage&q&f=false>
- El Midaoui, M., Laoula, E. B., Qbadou, M., & Mansouri, K. (2021). Logistics tracking system based on decentralized IoT and blockchain platform. *Indonesian Journal of Electrical Engineering and Computer Science*, 23(1), 421-430. <https://doi.org/10.11591/ijeecs.v23.i1.pp421-430>
- foud Ali, A., Zowayed, S. I., Showaiter, D. A., Khder, M. A., & Ali, B. J. (2022). Artificial intelligence's potential on Bahrain's labour market. 2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS), <https://doi.org/10.1109/ICETSIS55481.2022.9888902>
- Freeman, D. (2022). *Metaverse Investing: The Step-By-Step Guide To Understand Metaverse World And Business, Virtual Land, Defi, NFT, Crypto Art, Blockchain Gaming, And Play To Earn*. Darell Freeman.

<https://books.google.com.pk/books?id=A11qEAAAQBAJ&printsec=frontcover#v=onepage&q&f=false>

- Giachino, C., Cepel, M., Truant, E., & Bargoni, A. (2025). Artificial intelligence-driven decision making and firm performance: a quantitative approach. *Management Decision*, 63(10), 3454-3476. <https://doi.org/10.1108/MD-10-2023-1966>
- Guo, L., & Xu, L. (2021). The effects of digital transformation on firm performance: Evidence from China's manufacturing sector. *Sustainability*, 13(22), 12844. <https://doi.org/10.3390/su132212844>
- Haddad, H. (2021). The effect of artificial intelligence on the AIS excellence in Jordanian banks. *Montenegrin Journal of Economics*, 17(4), 155-166. <https://doi.org/10.14254/1800-5845/2021.17-4.14>
- Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer. <https://doi.org/10.1007/978-3-030-80519-7>
- Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2023). *Advanced issues in partial least squares structural equation modeling*. saGe publications. <https://uk.sagepub.com/en-gb/eur/advanced-issues-in-partial-least-squares-structural-equation-modeling/book279526>
- Hatamlah, H., Allahham, M., Abu-ALsondos, I., Mushtaha, A., Al-Anati, G., Al-Shaikh, M., & Ali, B. (2023). Assessing the moderating effect of innovation on the relationship between information technology and supply chain management: an empirical examination. *Applied Mathematics & Information Sciences*, 17(5), 889-895. <https://doi.org/10.18576/amis/170515>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Jawabreh, O., Mahmoud, R., & Ali, B. J. (2024). Big data in the hospitality industry: a methodical review. *TELKOMNIKA (Telecommunication Computing Electronics and Control)*, 22(4), 838-845. <https://doi.org/10.12928/telkonnika.v22i4.25543>
- Ji, C., Dong, X., & Lin, W. (2025). The effects of e-commerce adoption on the financial performance of agri-food enterprises in China. *Electronic Commerce Research*, 25(5), 3589-3607. <https://doi.org/10.1007/s10660-024-09810-z>
- Kumar, B., Roy, S., Singh, K. U., Pandey, S. K., Kumar, A., Sinha, A., Shukla, S., Shah, M. A., & Rasool, A. (2023). A Static Machine Learning Based Evaluation Method for Usability and Security Analysis in E-Commerce

- Website. IEEE Access, 11, 40488-40510.
<https://doi.org/10.1109/ACCESS.2023.3247003>
- Li, W., Sun, C., Li, Y., & Ertz, M. (2024). Effects of business to business e-commerce platform-governance mechanisms on seller firms' performance. *Research in International Business and Finance*, 67, 102121.
<https://doi.org/10.1016/j.ribaf.2023.102121>
- Lu, Z. (2022). Encryption management of accounting data based on DES algorithm of wireless sensor network. *Wireless Communications and Mobile Computing*, 2022(1), 7203237. <https://doi.org/10.1155/2022/7203237>
- Masoud, R., & Basahel, S. (2023). The effects of digital transformation on firm performance: The role of customer experience and IT innovation. *Digital*, 3(2), 109-126. <https://doi.org/10.3390/digital3020008>
- Mohapatra, M. R., & Rakshit, B. (2025). Does the Adoption of Blockchain Technology Necessarily Improve Firm Performance? Application of Meta-Analysis. *Emerging Markets Finance and Trade*, 61(14), 4366-4383.
<https://doi.org/10.1080/1540496X.2025.2509772>
- Moudud-Ul-Huq, S., Asaduzzaman, M., & Biswas, T. (2020). Role of cloud computing in global accounting information systems. *The Bottom Line*, 33(3), 231-250. <https://doi.org/10.1108/BL-01-2020-0010>
- Mujalli, A., Wani, M. J. G., Almgrashi, A., Khormi, T., & Qahtani, M. (2024). Investigating the factors affecting the adoption of cloud accounting in Saudi Arabia's small and medium-sized enterprises (SMEs). *Journal of Open Innovation: Technology, Market, and Complexity*, 10(2), 100314.
<https://doi.org/10.1016/j.joitmc.2024.100314>
- Nazara, D. S., Sutrisno, A., Nersiwad, N., & Muslimin, M. (2024). Digital transformation in operations management: Leveraging technology to improve business efficiency. *Journal of Operations Management*, 1(5), 77-84.
<https://pdfs.semanticscholar.org/b92b/0d18d9abfa27237e564d1dd88efd07592073.pdf>
- Oncioiu, I., Bilcan, F. R., Stoica, D. A., & Stanciu, A. (2019). Digital transformation of managerial accounting-trends in the new economic environment. *EIRP Proceedings*, 14(1). <https://proceedings.univ-danubius.ro/index.php/eirp/article/view/1919>
- Oudat, M. (2021). Board characteristics and intellectual capital performance: empirical evidence of bahrain commercial banks. *Academy of Accounting and Financial Studies Journal*. <https://doi.org/10.2139/ssrn.5147096>
- Salhab, H., Allahham, M., Abu-Alsondos, I., Frangieh, R. H., Alkhwaldi, A., & Ali, B. (2023). Inventory competition, artificial intelligence, and quality improvement decisions in supply chains with digital marketing. *Uncertain Supply Chain Management*, 11(4), 1915-1924. <https://doi.org/10.5267/j.uscm.2023.8.009>
- Salih Omar, S., Mohamed Nayef, J., Hashim Qasim, N., Tomaa Kawad, R., & Kalenychenko, R. (2024). The Role of Digitalization in Improving

- Accountability and Efficiency in Public Services. *Investigación Operacional*, 45(2). <https://revistas.uh.cu/invoperacional/article/view/9522>
- Shan, R., Xiao, X., Dong, G., Zhang, Z., Wen, Q., & Ali, B. (2022). The influence of accounting computer information processing technology on enterprise internal control under panel data simultaneous equation. *Applied Mathematics and Nonlinear Sciences*, 1-9. <https://doi.org/10.2478/amns.2022.2.0157>
- Tajudeen, F., Moghavvemi, S., Thirumoorthi, T., Phoong, S., & Bahri, E. (2025). Digital Transformation Issues and Challenges: Solutions for Malaysian SMEs. In (pp. 69-89). <https://doi.org/10.1108/978-1-83662-168-320251005>
- Toscano-Jara, J., Loza-Aguirre, E., Segura, M., & Franco-Crespo, A. (2024). Digital Transformation. *Innovar: Revista de ciencias administrativas y sociales*, 34(93), 1-26. <https://www.jstor.org/stable/27367199>
- Van, H. V., Afifa, M. A., & Saleh, I. (2024). Accounting information systems and organizational performance in the cloud computing era: evidence from SMEs. *Sustainability Accounting, Management and Policy Journal*. <https://doi.org/10.1108/SAMPJ-01-2024-0044>
- Wang, L., Liu, S., & Xiong, W. (2022). The impact of digital transformation on corporate environment performance: evidence from China. *International Journal of Environmental Research and Public Health*, 19(19), 12846. <https://doi.org/10.3390/ijerph191912846>
- Yang, Y., Chen, N., & Chen, H. (2023). The digital platform, enterprise digital transformation, and enterprise performance of cross-border e-commerce— from the perspective of digital transformation and data elements. *Journal of Theoretical and Applied Electronic Commerce Research*, 18(2), 777-794. <https://doi.org/10.3390/jtaer18020040>
- Zhao, X., Li, X., Li, Y., & Wang, Z. (2024). The impact of digital transformation on firm performance. *Industrial Management & Data Systems*, 124(8), 2567-2587. <https://doi.org/10.1108/IMDS-09-2023-0661>
- Zimonjić, M. (2024). Impact of digital transformation on the competitive advantage of companies. *Megatrend revija*, 21(1), 13-22. <https://doi.org/10.5937/MegRev2401013Z>