Evaluating the Impact of Computerized Accounting Information System on the Economic Performance of Construction Companies in Iraq

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The aim of this study is to determine the effect of the three contexts of Computerized Accounting Information System (technological, organizational, and environmental) on construction companies' economic performance. To achieve this aim, a survey was conducted on 208 construction companies that adopted CAIS with 152 valid responses received, representing a 73% rate of useable responses. The data analysis was carried out adopting the partial least squares structural equation modelling (PLS-SEM) technique. The results indicate that the technological and organizational context of CAIS had a positive significant effect on construction companies' economic performance while the environmental context had a negative significant effect on construction companies' economic performance. This research's findings are significant to the practice of adopting CAIS technology on construction projects in developing countries since it provides the likely effect of the various contexts of CAIS on the economic performance of construction companies which will be beneficial for planning and decision-making to the construction companies' management. Theoretically, the findings of this study will enrich existing literature by providing empirical proof of the variable effect of the various CAIS contexts on construction companies' economic performance in Iraq which has not been considered in the existing literature. This study is limited to construction companies in Iraq.

Povzetek: Narejena je bila analiza vpliva informacijskih sistemov (tehnološko, organizacijsko, okoljsko) na učinkovitost poslovanja gradbenih podjetij.

1 Introduction

The construction industry is among the most complex industrial settings in the world today. The construction sector accounts for a large portion of the economy in emerging economies such as Iraq. Regardless of its economic importance, the construction industry's productivity is consistently lower than other industries like the manufacturing and oil sectors. The Iraqi economy has had an extraordinary increase in its gross domestic product (GDP) over the last three decades, as evidenced by Breghish and Ali [1]. The construction industry, on the other hand, has completed spectacular projects that were not time, cost, or quality effective [2, 3]. Furthermore, the construction industry has a bad reputation for poor performance and productivity [4, 5]. This gives rise to the need for computerization as a means of solving such issues.

The primary purpose of adopting a Computerized Accounting Information System (CAIS) is the need for greater economic performance [6]. Basically, CAIS has three adoption contexts which include, technological context, organizational context, and environmental context [2]. Therefore, CAIS has become the major driver for construction companies' economic performance [7]. As a result of the importance of CAIS to company's economic performance, it has been considered as one of the topical issues of organizational study and government policy, giving rise to words like 'CAIS' and 'Computerized Economy' becoming increasingly common. As a result, understanding CAIS is a strategic asset to an organization which could serve as a tool for economic performance in particular and overall company performance [8].

Additionally, CAIS has developed into a strategic philosophy that aids businesses in developing strategic competencies in dealing with the increased dynamism and unpredictability of the business climate. Researchers and practitioners agree that computerization is critical to improving and preserving a construction company's performance [9, 10]. Several academics believe that computerization is an company's most valuable and vital resource [11]. In contrast, others believe that computerization is crucial to an organization's existence [12].

CAIS has been a primary strategy for many organizations looking to enhance their organizational performance [13-15]. Generally, CAIS adoption is currently recognized as

a criterion for construction company's performance, and the CAIS strategy is being adopted by a rising number of organizations [16-18]. In addition, Gaikwad and Sunnapwar [19] showed that many organizations that implemented CAIS factors as a corporate strategy have failed to meet their aspirations and are getting disenchanted with CAIS's usefulness. The emphasis of early CAIS studies was on technology as a fundamental key to information flow [20]. In addition, construction industry stakeholders have made significant investments in information technology to guarantee the success of CAIS initiatives, but has failed to yield the expected results [21].

Apart from that, Kong, et al. [22] argued that, although beneficial in certain aspects, CAIS initiatives have not always resulted in better services and products, superior work processes, or more effective personnel. For example, there have been examples of a vast volume of paperwork, delayed data processing, and, as a result, delays in the generation of management accounts [23], which has had some impact on economic performance. This gives the basis for conducting this study to ascertain how Iraqi construction companies have fared economically while adopting CAIS. Also, given that the level of CAIS adoption in construction companies in Iraq is still at its early stages [24], it is critical to figure out which CAIS adoption elements/contexts have a major impact on the economic performance of Iraqi construction firms.

The concept of computerization as a value to construction companies has recently garnered widespread recognition and interest. CAIS is becoming more and more vital in the construction industry, as appropriate computerization of a company's processes is critical to its existence [25]. Nevertheless, formal CAIS deployment in Iraq, especially within the construction industry, is still in its early stages [26]. As a result, construction companies must better understand the importance of computerization as a valuable asset in improving their economic performance and incorporating CAIS efforts into their strategic management schedule to achieve their objectives. With some degree of certainty of the economic performance outcome of adopting CAIS, more construction companies who hitherto are reluctant to adopt CAIS will be encouraged to do so. Therefore, the general objective of this study is to determine the nature and type of effect CAIS adoption contexts have on construction companies' economic performance.

This study has a lot of significance. First, the study will be significant to construction companies since it will predict with a great degree of certainty on the likely economic performance outcome of adopting CAIS. This will help them in making informed decision on the adoption of CAIS. Also, the study will be significant to the government of developing countries whose construction industry are at the early stages of adopting CAIS. This study's findings will enable them to make the required interventions by way of enlightenment and development of the required expertise in construction companies towards adopting CAIS for improved economic productivity.

2 Literature Review

2.1 Effect of CAIS Technological Context on Construction Companies' Economic Performance

The technological context of CAIS can be defined as both the internal and external technologies that are required in the company to facilitate its adoption of CAIS [27]. It comprises of the existing practices and equipment within the company, this is in addition to the collection of existing technologies outside the company [28]. Frank, et al. [28] opined that the choice to adopt technology is contingent on what is available, and also the degree to which the available technology is compatible with the firm's existing technology. The technological context of an organization is essential in influencing the adoption, and performance of new information technologies and information systems [29].

Some related works in this niche research area have reported findings on the nexus between the technological context of CAIS and companies' economic performance. For example, Mutie [30] reported a positive relationship between technological context of CAIS and construction companies' economic performance. Additionally, Wang, et al. [17] found that the relationship between CAIS technology context and companies' economic performance is positive. Similarly, Asian, et al. [31] and Lu, et al. [32] revealed that the higher the technological expertise of a firm regarding CAIS, the higher companies' economic performance.

Also, the result obtained by Amusawi, et al. [33] acknowledged the positive relationship between reports preparation decision making and companies' economic performance. For instance, the outcome of a research by Katsaros, et al. [34] showed that there is a positive relation between technology capability and the economic performance of companies' while adopting new technologies. Organizational technology acceptance model showed that technology culture is an important link between employee skills and economic performance outcomes [35]. In view of the literature reviewed, the following hypothesis is generated:

H1: CAIS technological context has a positive significant effect on construction companies' economic performance.

2.2 Effect of Organizational Context of CAIS on Construction Companies' Economic Performance

The organizational context of CAIS can be defined as the characteristics and resources of the organization available to facilitate the adoption of new technologies [36]. According to the technology organization and environment framework, organizational adoption of innovative technologies can be affected by the organizational context [37, 38]. For this study, organizational context of CAIS is conceptualized as a firm's readiness to implement CAIS. Nwagwu [39]

reported that apart from the fact that organizations can attain their organizational readiness and financial readiness through organizational culture, it can also increase its organizational readiness and financial readiness by sharing the employees' computerization inclinations within the organization. Numerous research also indicated that an organization context focused on organizational culture results in positive organizational readiness and financial readiness, leading to economic performance [40].

Apart from financial capability, the ability to judiciously utilize new computerized systems and correctly manage this computerization within a firm has become the major determinant for construction companies' economic performance [41-43]. Also, the capacity to create and take advantage of the value of a construction companies' non-physical resources comprise a fundamental competency for companies, especially those delivering professional services and can lead to greater economic performance [44]. Organizational context represented by financial capability was found to positively influence companies performance [45]. Caseiro and Coelho [46] suggested that capabilities characteristic of the organizational context of CAIS could be a source of construction companies' economic. Other previous studies obtained similar result while investigating the relationship between organizational context represented by technology capability and companies' economic performance [47]. In view of the various leanings from the reviewed literature, it is hypothesized as follows:

H2: CAIS organizational context has a positive effect on construction companies' economic performance.

2.3 Effect of CAIS Environmental Context on Construction Companies' Economic Performance

Environmental context refers to external pressure companies receive to implement CAIS [48]. External pressure emanates from customer, supplier, government demands, market pressure or variations in the external environment [49]. As Al-Bataineh and Gallagher [50] contended, productivity is the real source of CAIS, and CAIS advantage can result in high performance through improved competitive advantage.

Many studies observed that external pressure is topmost among the factors affecting CAIS implementation [51]. One of the external pressures faced by construction companies while adopting CAIS is competitive pressure [52]. It is largely presumed that when competition among companies rises, the possibility of innovation adoption will also increase accordingly [53, 54]. This suggests that the greater the external pressure perceived by construction companies the more the possibility of them considering efficient implementation of CAIS to improve their economic performance, and keep their competitors at bay. The effect of the environmental context could also be in the form of pressure from the government and its agencies to adopt CAIS [52]. The government could provide both financial and non-financial incentives to aid a seamless adoption of CAIS, which would invariably lead to greater organizational economic performance [55]. Therefore, the third hypothesis of the study is stated as follows:

H3: CAIS environmental Context has a significant positive effect on construction companies' economic performance.

The conceptual model of this study showing the stated hypotheses is presented in Figure 1.

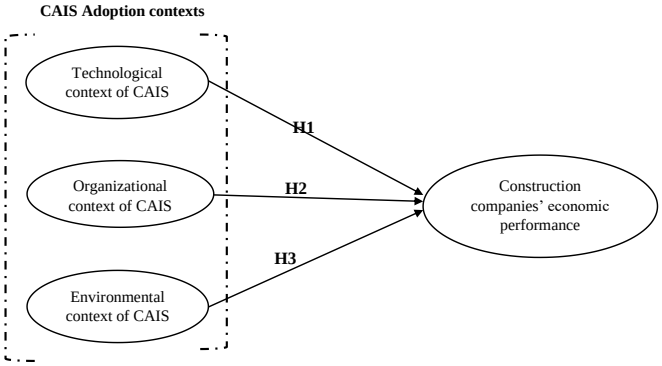

Figure 1 Conceptual model of the study

3 Methodology

3.1 Sample and data collection process

The non-probability sampling technique was adopted for data collection from construction companies in Iraq. The sample of this research was taken from the directory of the Iraqi ministry of higher education and scientific research for contracting companies operating in the universities of southern Iraq. Contracting companies operating in the southern Iraq were chosen for this research because they are the most CAIS adopters in Iraq [56].

The ministry of higher education and scientific research's guide is published by the Iraqi ministry of planning in collaboration with the Iraqi academics' association. This directory gives a list of construction companies in Iraq. The guide is an official state publication. Information related to the construction companies' background, address, name of the chief executive officer (CEOs), year it was incorporated, alongside other useful information about the companies are contained in the database of the directory. Additionally, the guide offers information related to the annual work carried out, the number of employees, buildings completed and similar works, and the quality standards achieved.

The survey respondents were the managers, CEO or Senior Manager of contracting companies operating in the universities of Southern Iraq. This research focused only on large and medium contracting companies because the literature has revealed that large and medium organizations are more likely to adopt CAIS when compared to smaller construction companies (Faccia et al., 2019) . After identifying the construction companies eligible to participate in the survey, they were contacted via emails and phone calls, describing the aim of the

research, and inviting them to participate. After obtaining the informed consent from the respondents, data collection started from June to November 2021, using a structured questionnaire. Reminders were sent at intervals asking respondents to fill the questionnaires. The gamma exponential method was adopted in establishing the sample size for this study Kock and Hadaya [57]. The gamma exponential method recommends a minimum sample of 146 at a power of 0.8 and a minimum absolute significant path coefficient of 0.197. In total, 208 questionnaires were distributed, and 152 useable responses were obtained, signifying an 73% response rate, thus satisfying the minimum sample size.

3.2 Questionnaire design and development

The constructs of this study were adapted from prior research and measured using a 5-point Likert scale. Specifically, the three contexts of computerized accounting information system (CAIS) namely the technological context, organizational context, and the environmental contexts were adapted from Nguyen and Nguyen [58]. While the items measuring companies' economic performance were measured using 11 items measured using a 5-point Likert scale adapted from Ullah, et al. [59]. Specifics of the study constructs and the sources from which they were adapted are presented in Table 1.

To ensure that the study's constructs are reliable, pilot test was conducted. The pilot tests helped in determining how easily the respondents understood the questionnaire items and the amount of time required to fill in their responses. The possibility of vagueness in the questionnaire questions was minimized by the pilot test conducted, thus guaranteeing its reliability. TC, OC, EC, and EP constructs has composite reliability values of 0.867, 0.825, 0.914, and 0.781, respectively. This shows that each of the constructs were highly reliable.

Constructs	Sources
Technological context (TC)	Nguyen and Nguyen [58]
Adopting CAIS enhances the efficiency to which my company records its financial dealings (TC1)	
The efficient preparation of reports and financial statements is one of the areas my company has benefitted from CAIS (TC2)	
The amount of time required to record financial transaction has been shortened significantly since the introduction of CAIS (TC3)	
The precision in the preparation of financial statements has increased significantly due to CAIS adoption (TC4)	
Decision making in my organization has improved significantly given the quality of information provided by the CAIS (TC5)	
Financial records are made readily available for the purpose of decision making by CAIS (TC6).	
My organization is availed the opportunity of having accurate and up to date information as at when needed by decision makers through the CAIS (TC7).	
Organizational context	Nguyen and Nguyen [58]
Financial resources are within my organizations disposal for the adoption of CAIS (OC1).	
My organization has budgeted funds for staff training programs as well as budgets aimed at increasing proficiency in adopting CAIS technologies (OC2).	
Budget for the regular upgrade of existing versions of CAIS is usually set aside (OC3).	
Our organization has the required hardware and software to fully adopt CAIS (OC4).	
The required skilled manpower is available within our organization for CAIS adoption (OC5).	
There are motivational programs within our organization that inspire staff to learn and make use of CAIS (OC6).	
Environmental context (EC)	Nguyen and Nguyen [58]
Our customers had an influence on our adoption of CAIS (EC1).	
Our organization's decision to adopt CAIS is influenced by our suppliers (EC2).	
Competition within the construction industry has made	

my organization strive to adopt CAIS (EC3).	
The pressure from government agencies has influenced our decision to adopt CAIS (EC4).	
Economic performance (EP)	Ullah, et al. [59]
My company experiences poor budget estimation (EP1)	
Appropriate financial analysis is lacking in my organization (EP2).	
My company has experienced bad cash flow from the projects it has carried out (EP3).	
There is irregular budget update in my organization (EP4).	
Liquidity is lacking in my organization (EP5).	
There is a material price hike resulting from CAIS adoption in my company (EP6).	
High security measure cost (EP7).	
My company has recorded excessive claims due to CAIS adoption (EP8)	
The market share of my organization has reduced significantly (EP9)	
My company has undertaken excessive rework (EP10).	
Material waste in my organization is currently on the increase (EP11).	

Table 1. Constructs measured and their respective sources

3.3 Methods of data analysis

The partial least squares structural equation modelling (PLS-SEM) technique was employed to analyse the data for this research using WarpPLS version 8 software. PLS-SEM technique was adopted since it has the capability of testing theoretical relationships between variables [60]. Furthermore, the data collected for this research was not normally distributed which is a recommendation for adopting the PLS-SEM technique [61].

The "factor-based PLS algorithm" was used to evaluate the measurement model, while the "stable 3" method was adopted in estimating the P-values [62]. The structural model was evaluated making use of the warp 3 algorithm. This produces values of the path coefficients and p-values considering non-linear relationships [63]. The selection of the factor-based PLS is due to its ability to generate values of both true composites and factors taking into account the measurement error [64].

4 Results

4.1 Demographics of Respondents

The respondents' demographics are presented in Table 2. From a total of 153 firm representatives who took part in the survey, their years of working experience all varied from less than 5 to more than 20 years of working experience. A total of 7.8% had experience in the construction field for 5 and less than 10 years while 62.7 % of the respondents had experience of 10 and less than 15 years. However, 29.4% of the respondents had working experience of 15 and less than 20 years. Therefore, it can be said that majority of the respondents had many years of working experience in the construction field with a cumulative percentage of 92.7% of more than 10 years of experience.

Demographics	**Frequency**	**Percentage (%)**
Respondents' level of experience		
5 and less than 10 years	12	7.8
10 and less than 15 years	96	62.7
15 and less than 20 years	45	29.4
Highest Educational qualification of respondents		
Bachelor's degree	59	62.8
Masters' degree	34	36.2
Doctorate degree	1	1.1
Field of study		
Accounting	73	47.7
Business Administration	52	34.0
Finance and Banking	16	10.5
Others	12	7.8

Table 2. Demographics of respondents

The data regarding the highest educational qualification of the respondents is presented in Table 2. The results obtained with respect to the respondents' highest educational qualification showed that 62.8% of the respondents had at least a bachelor's degree, with 36.2%

of the respondents also holding a master's degree, while 1.1% had doctorate degree as their highest academic qualifications. The results in the Table 2 show that 73 (47.7%) of the respondents are in the accounting field followed by 32 (34.0%) in business administration, finance and banking 16 (10.5%). A total of 12 (7.8%) of the respondents stated that they belong to other fields.

4.2 Measurement model estimation

In evaluating a reflective measurement model, three main criteria are evaluated [65]. These include internal consistency reliability, convergent validity (indicator reliability/outer loading and average variance extracted), and discriminant validity. The results obtained for the reflective measurement model are shown in Table 3.

Construct	Items	Loadings	AVE	CR
Technological context	TC1	0.665	0.782	0.867
	TC2	0.665		
	TC3	0.559		
	TC4	0.773		
	TC5	0.928		
	TC6	0.740		
	TC7	0.949		
Organizational context	OC1	0.831	0.619	0.825
	OC2	0.889		
	OC3	0.743		
	OC4	0.870		
	OC5	0.776		
	OC6	0.633		
	OC7	0.551		
Environmental Context	EC1	0.633	0.842	0.914
	EC2	0.769		
	EC3	0.858		
	EC4	0.646		
Economic performance	CR1	0.641	0.871	0.781
	CR2	0.503		
	CR3	0.591		
	CR4	0.710		
	CR5	0.632		
	CR6	0.829		
	CR7	0.721		
	CR8	0.686		
	CR9	0.568		
	CR10	0.883		
	CR11	0.762		

Table 3. Measurement model evaluation

The composite reliability was calculated to ascertain the reliability of the questionnaire items for each construct. The composite reliability values obtained for each of the questionnaire constructs are greater than 0.7, thus confirming the reliability of the questionnaire constructs [66]. In measuring the convergent validity for the measurement model, the Average Variance Extracted (AVE) is used [67]. As shown in Table 3, the AVE values for all the study's constructs are higher than 0.5, thus all the constructs meet the threshold value for convergent validity [67]. Discriminant validity is assessed in the measurement model using the Fornell and Larcker criterion [68]. The results presented in Table 4 suggests that the values are greater than 0.50 with every single item in the primary diagonal and are greater than off-diagonal items in their respective rows and columns, thus satisfying Soundarapandiyan, et al. [69] threshold value for discriminant validity. This shows that discriminant validity is attained since the constructs are markedly unique from one another.

	Technological context	Organizational context	Environmental Context	Economic performance
Technological context	0.782			
Organizational context	0.347	0.619		
Environmental Context	0.359	0.475	0.842	
Economic performance	0.234	0.499	0.481	0.615

Table 4. Discriminant Validity using Fornell and Lacker Criterion

Note: Diagonals stand for the square root of the AVE while the off-diagonals are representative of the correlations.

Table 5 presents a method of determining the discriminant validity analysis by comparing the cross loadings among constructs. Table 5 shows that all the indicators have high loading on their respective constructs but low on other constructs. This implies that the study constructs have sufficient level of discriminant validity, and the constructs are distinct from each other.

	Technological context	**Organizational context**	**Environmental Context**	**Economic Performance**
TC1	**0.665**	-0.255	0.355	-0.002
TC2	**0.665**	0.418	-0.257	-0.058
TC3	**0.559**	0.117	-0.061	0.683
TC4	**0.773**	-0.420	-0.206	-0.154
TC5	**0.928**	0.161	-0.055	0.097
TC6	**0.740**	0.236	-0.351	0.280
TC7	**0.949**	0.028	-0.064	0.042
OC1	0.294	**0.831**	0.051	-0.126
OC2	0.018	**0.889**	-0.151	-0.027
OC3	0.509	**0.743**	-0.011	-0.173
OC4	0.126	**0.870**	0.107	-0.123
OC5	0.082	**0.776**	-0.114	0.015
OC6	0.385	**0.633**	0.212	0.231
OC7	0.437	**0.551**	-0.305	-0.242
EC1	0.277	0.441	**0.633**	-0.172
EC2	0.626	-0.111	**0.769**	0.023
EC3	-0.055	-0.037	**0.858**	0.061
EC4	-0.041	-0.162	**0.646**	0.674
CR1	0.006	-0.072	-0.017	**0.641**
CR2	0.017	0.080	-0.130	**0.503**
CR3	-0.017	0.035	-0.162	**0.591**
CR4	-0.007	-0.065	-0.189	**0.710**
CR5	0.045	0.091	0.102	**0.632**
CR6	-0.012	0.003	0.134	**0.829**
CR7	-0.069	0.129	0.204	**0.721**
CR8	-0.169	-0.089	0.118	**0.686**
CR9	0.121	-0.015	0.172	**0.568**
CR10	-0.175	-0.151	0.663	**0.883**

Table 5. Cross-Loadings

4.3 Structural model evaluation

In structural model evaluation using the PLS-SEM technique, six tests recommended by Hair , et al. [70] need to be carried out. These tests include evaluation of the structural model for collinearity issues, evaluation of the significance and relevance of the structural model relationships, assessment of the level of the coefficient of determination R2, assessment of the effect size (f2), assessment of predictive relevance Q2. In assessing collinearity in the model, the variance inflation factor (VIF) is used (See Table 6). All constructs in the model had VIF values below 3.3, therefore fulfilling Diamantopoulos and Siguaw [71] cut-off value. This indicates the absence of collinearity issues in the model. The R2 value of 0.30 was gotten in this research (see Figure 2), signifying that the model substantial predictive accuracy Chin [72]. Furthermore, the predictive relevance Q2 value of 0.311 was obtained which implies that the exogenous constructs have predictive relevance for the endogenous construct (economic performance), since its value is significantly greater than zero [62]. Next is the testing of the study's hypotheses.

Constructs	**Full collinearity VIF**
TC	1.226
OC	1.328
EC	1.064
EP	1.318

Table 6. Full collinearity VIF

4.4 Hypotheses Testing

Table 4 presents the hypotheses testing results. The results indicate that TC has a significant positive effect on EP (P <0.001, β = 0.249), which supports hypothesis 1 (H1). OC has a significant positive effect on EP (P <0.001, β = 0.334), lending support to H2. However, EC has a negative significant effect on EP (P <0.001, β = -0.248) which does not support H3.

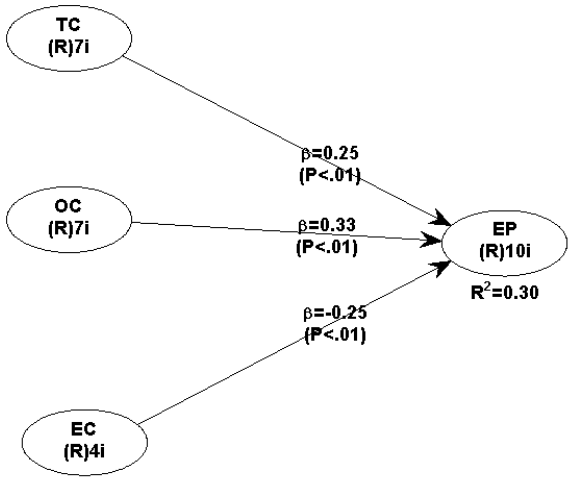

Figure 2 Structural model results

The effect sizes (f2) of the relationships are interpreted in line with Cohen [73] recommendations. f2 values above 0.02 and up to 0.15 are deemed to be small, values of 0.15 and up to 0.35 as medium, while values of 0.35 and above as large effects. Therefore, TC has a small effect on EP (see

), OC has a small effect on EP, while EC has a small negative effect on EP.

Hypothesis	Relationships	P-value	Path Coefficient(β)	Effect Size (f^2)	Comments	Decision
H1	TC→EP	<0.001	0.249	0.088	Significant	Supported
H2	OC→EP	<0.001	0.334	0.139	Significant	Supported
H3	EC→EP	<0.001	-0.248	0.073	Significant	Not Supported

Table 7. Results of hypotheses testing

(TC =Technological context, OC = Organizational context, EC = Environmental context, EP = Economic performance)

The next section discusses the results obtained in this study.

5 Discussion

This study was designed to evaluate the effect of the technological context, organizational context, and environmental context of CAIS on construction companies' economic performance. The results gotten showed that the technological context of CAIS had a positive significant effect on EP which supports H1, OC had a positive significant effect on CAIS supporting H2, while the environmental context (EC) had a negative significant effect on construction companies' economic performance which does not support H3.

The significant positive effect of technological context of CAIS on companies' economic performance (H1) obtained is similar to the findings of Masood and Egger [29] who reported that TC positively influences construction companies' EP. Also, Mutie [30] and Wang, et al. [17] reported that TC is positively correlated with EP which corroborates the finding of this present study. Additionally, Asian, et al. [31] and Lu, et al. [32] revealed that the higher the technological capability of a firm regarding CAIS, the higher companies' economic performance which confirms this study's findings. Technological capability which is a part of technological context of CAIS was found by Katsaros, et al. [34] to have a direct positive effect on companies' economic performance, thus supporting this research's finding. The possible reason for the significant positive effect of TC on companies' EP found in this study could be due to the fact that when organizations are vast with respect to adopting other technologies, the adoption of CAIS would be much easier in view of their past experience in technology adoption, thus leading to EP.

Additionally, this research's findings indicate that the organizational context of CAIS has a positive significant effect on construction companies' economic performance which supports H2. This finding is similar to that of Atkin and Brooks [41] and Taherdoost and Brard [43] who found that aside financial capacity, the ability to judiciously utilize CAIS and efficiently operate it internally within the firm is the most important criteria for construction companies' economic performance. This study's findings are also similar to that of Baima, et al. [44] and Tortorella, et al. [47].

The likely reason for the results obtained in this study for H2 could be that the construction companies considered have developed strong capabilities to control and make use of their nonphysical assets which contributes to improved economic performance. Also, the construction companies under consideration in this study have huge financial assets which can enable them to procure the needed expertise in the adoption of CAIS which increases the chances of their CAIS adoption to be more economically viable, hence leading to their economic performance. Another likely reason for the positive significant relationship between OC and EP obtained in this study is the technological capacity of the company prior to adopting CAIS. When the construction company is technologically savvy, adoption of a new technology such as CAIS will be without hitches thus enabling the company to receive all the accruable benefits which results in EP.

Lastly, the study's findings show that the environmental context of CAIS has a significant negative effect on construction companies' economic performance (H3). This is contrary to the findings of Zhang, et al. [51] who reported a positive significant effect of EC on construction companies' EP. Also, Muhammad Auwal, et al. [54] found that the pressure emanating from the companies' operating environment would serve as a trigger for improved economic performance, thus contradicting the findings of this present study. The negative significant effect of EC on construction companies' EP obtained in this study could be due to the construction companies' inability to manage external pressure coming from their external environment such as pressure from suppliers and clients. Another likely reason for the negative effect of EC on EP could be that the operating environment does not provide an avenue for a healthy competition between companies. This discourages innovation in the companies adopting CAIS, thus impacting negatively on their EP. This finding also contradicts the findings of Kohli and

Melville [53] who view innovation resulting from the adoption of CAIS as a trigger for competitive advantage and increase in EP.

6 Conclusion

This research was designed to investigate the effect of TC of CAIS on EP, the effect of OC of CAIS on EP, and the effect of EC of CAIS on EP. The results obtained show that hypothesis 1 (H1), and hypothesis 2 (H2) were supported, while hypothesis 3 (H3) was not supported. The findings of this research suggest that both the technological and organizational context of CAIS need to be adequately grounded in construction companies to guarantee optimal EP. Also, the negative relationship obtained in the relationship between EC and EP means that the current operating environment cannot yield a favorable economic performance outcome when CAIS is adopted. Therefore, the government and professional organizations are required to do more by way of enlightening the companies and creating a favorable framework for an economically viable CAIS adoption process.

7 Limitations and future studies

This research has a lot of strengths and was able to achieve its aim. However, there are a number of shortcomings that can be addressed in future research. First, quantitative method was used in this study and data were collected using a structured survey questionnaire. This restricts the respondents to the range of answers presented in the questionnaire. Future research can consider adopting a qualitative method to gain greater perspectives on the relationships considered in this study. Also, this research was carried out in Iraq, a developing country in the west of the Asian continent. Therefore, its findings can only be generalized within this context. It is recommended that future research be carried out in other countries, and the results compared with those gotten in this study.

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