THE MEDIATING EFFECT OF INNOVATION CULTURE IN COMPUTERISED ACCOUNTING INFORMATION SYSTEM (CAIS) IMPLEMENTATION FACTORS TOWARDS CONSTRUCTION COMPANIES PERFORMANCE IN IRAQ

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by

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"In the name of Allah, the Most Gracious and the Most Merciful"

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LIST OF SYMBOLS

$\|\beta\|min$	absolute value of minimum path coefficient of 0.197
e	exponential smoothing function
f^2	assessment of the effect size
Ň	Minimum sample size required
Normal-JB	Jarque-Bera test of normality
Normal-RJB	robust Jarque-Bera test of normality
Q^2	assessment of predictive relevance
R^2	assessment of the level of the coefficient of determination
β	path coefficients

LIST OF ABBREVIATIONS

AARS	Average Adjusted R-squared
ACWP	Actual Cost of the Work Performance
AFVIF	Average Full Collinearity Variance Inflation Factors
AIS	Accounting Information System
APC	Average Path Coefficient
ARS	Average R-squared
AVE	Average Variance Extracted
BCWP	Budgeted Cost of Work Completed
BSC	Balanced Scorecard
CAIS	Computerised Accounting Information System
CAISAI	Computerised Accounting Information System Assessment Instrument
CB-SEM	Covariance-Based Structural Equation Modelling
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CPI	Cost Performance Index
CR	Cost Resources
CVF	Competing Values Framework
DV	Dependent Variable
EC	Environmental Context

EFA	Exploratory Factor Analysis
ER	External Resources
GDP	Gross Domestic Product
GOF	Goodness of Fit
HTMT	Heterotrait Monotrait Ratio of Correlations
IN	Innovation
INTR	Internal Resources
IT	Information Technology
IV	Independent Variable
LBNL	Lawrence Berkeley National Laboratory
NLBCDR	Nonlinear Bivariate Causality Direction Ratio
OC	Organisational Context
OCAI	Organisational Culture Assessment Instrument
OR	Owners' Resources
PB	Perceived Benefit
PLS	Partial Least Squares
PRC	Performance Factors Related to the Contractor
QR	Quality Resources
RBV	Resource-Based View
RSCR	R-Squared Contribution Ratio
SEM	Structural Equation Modelling

SPR	Simpson's Paradox Ratio
SSR	Statistical Suppression Ratio
TC	Technological Context
TM	Time Resources
TOE	Organisation, Technology, and Environment
VIF	Variance Inflation Factor

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KESAN PENGANTARAAN BUDAYA INOVASI FAKTOR IMPLEMENTASI SISTEM MAKLUMAT PERAKAUNAN KOMPUTER (CAIS) TERHADAP PRESTASI SYARIKAT PEMBINAAN DI IRAQ

ABSTRAK

Industri pembinaan perlu melaksanakan teknologi baru, seperti sistem maklumat perakaunan berkomputer (CAIS), untuk mengatasi beberapa rintangan demi menyesuaikan dengan persekitaran pembinaan yang sentiasa berubah. Terdapat keperluan untuk menyelidik kesan konteks CAIS terhadap prestasi syarikat pembinaan dan peranan budaya inovasi sebagai perantara antara CAIS dan prestasi syarikat pembinaan. Satu penilaian menyeluruh terhadap kajian literatur telah dijalankan sebagai tindak balas terhadap jurang penyelidikan yang dikenal pasti ini, dengan menumpukan kepada hubungan antara CAIS dan prestasi syarikat pembinaan. Hasil kajian literatur menunjukkan bahawa CAIS dan prestasi syarikat pembinaan kurang difahami. Penyelidikan empirikal diperlukan untuk menutup jurang ini dan memperbaiki amalan penggunaan CAIS dalam industri. Kajian ini bertujuan untuk menyiasat kesan konteks CAIS terhadap prestasi syarikat pembinaan dan peranan budaya inovasi sebagai moderator dalam hubungan antara CAIS dan prestasi. Syarikat pembinaan di Iraq ditemubual bagi kajian ini menggunakan soal selidik berstruktur yang diisi sendiri. Daripada populasi 208 perniagaan, teknik pensampelan bukan kebarangkalian digunakan, menghasilkan kadar respons sebanyak 73%. Data yang dikumpulkan dianalisis untuk menentukan pengaruh CAIS terhadap prestasi syarikat pembinaan. Keputusan menunjukkan bahawa ketiga-tiga konteks CAIS tidak mempunyai kesan yang signifikan terhadap prestasi syarikat pembinaan. Walau

bagaimanapun, kajian ini mendapati bahawa budaya inovasi sepenuhnya memediasi hubungan antara CAIS dan prestasi syarikat pembinaan. Penemuan ini menekankan kepentingan membina budaya inovasi dalam syarikat pembinaan dan melabur dalam proses CAIS untuk meningkatkan prestasi keseluruhan. Berdasarkan hasil kajian, disarankan agar syarikat pembinaan memberi keutamaan kepada pembangunan budaya inovasi yang menggalakkan dan menyokong amalan dan inisiatif inovatif. Selain itu, pelaburan dalam CAIS perlu disertai dengan usaha untuk membina budaya organisasi yang inovatif. Kajian ini menyumbang kepada pemahaman mengenai fungsi CAIS dan budaya inovasi dalam meningkatkan prestasi syarikat pembinaan. Disyorkan agar kajian lanjutan menyelidik pemboleh ubah lain yang mungkin mempengaruhi hubungan antara CAIS, budaya inovasi, dan prestasi.

THE MEDIATING EFFECT OF INNOVATION CULTURE IN COMPUTERISED ACCOUNTING INFORMATION SYSTEM (CAIS) IMPLEMENTATION FACTORS TOWARDS CONSTRUCTION COMPANIES PERFORMANCE IN IRAQ

ABSTRACT

The construction industry must implement new technologies, such as computerise accounting information systems (CAIS), to overcome a number of obstacles in order to adapt to the ever-changing construction environment. There is a need to investigate the effect of CAIS contexts on construction companies' performance and the role of innovation culture as a mediator between CAIS and construction companies' performance. A thorough evaluation of the literature was done in response to this identified research gap, focusing on the relationship between CAIS and construction companies' performance. The finding of the literature study showed that CAIS and construction company performance are poorly understood. Empirical research is needed to close this gap and improve CAIS implementation industry practises. This study seeks to investigate the impact of CAIS contexts on the performance of construction companies and the role of innovation culture as a moderator in the relationship between CAIS and performance. The construction companies in Iraq were surveyed for this study using a structured, self-administered questionnaire. From a population of 208 businesses, a non-probability sampling technique was employed, resulting in a 73% response rate. The collected data were analysed to determine the influence of CAIS on the performance of construction companies. The results indicate that none of the three CAIS contexts had a substantial effect on the performance of construction companies. The study revealed, however,

that innovation culture entirely mediates the relationship between CAIS and the performance of construction companies. These findings underscore the significance of nurturing an innovation culture within construction firms and investing in CAIS processes to improve overall performance. On the basis of the findings, it is suggested that construction firms prioritise the development of an innovation culture that promotes and supports innovative practises and initiatives. Additionally, investment in CAIS should be accompanied by efforts to cultivate an innovative organisational culture. This study contributes to the comprehension of the function of CAIS and innovation culture in enhancing the performance of construction companies. It is recommended that additional research investigate other variables that may influence the relationship between CAIS, innovation culture, and performance.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter's goal is to provide an overview of the research. Initially, the first section provides a brief background on Computerised Accounting Information Systems (CAIS), organisational innovation, and construction companies' performance. The research problem, research model, and research questions are presented in the next section. The next part covers the problem's background, the study's reasoning, and key terms. The importance of the research is then presented. Finally, this chapter ends with a description of the organisation of the thesis.

1.2 Background of the Study

Organisational performance basics have shifted toward CAIS emphases (Abdulle et al., 2019; Oduro et al., 2022). CAIS are software-based systems that are designed to electronically process and manage accounting transactions and financial data. They provide automated methods for recording financial transactions, generating financial reports, and carrying out a variety of other accounting tasks. CAIS can enhance the effectiveness, precision, and timeliness of financial reporting and decision-making. (Abdulle, 2019; Qatawneh, 2020). It has become an enduring source of performance for construction companies, financial performance in the public sector (Almgrashi, 2020; Oduro et al., 2022). It has also risen to the forefront of organisational study and government policy, with words like 'CAIS' and 'Computerised Economy' becoming increasingly common. As a result, understanding CAIS seems to be the only strategic asset that improves instead of degrades in usage (Abdulle, 2019; Ngwakwe, 2022; Qi et al., 2021).

In any performance context, intangible resources can be used to produce a construction company's performance, with human capital being the most important since it is the most challenging to duplicate. Human capital and Quality refers to the skills, CAIS, as well as talents enshrined in people (Aliu & Aigbavboa, 2019).

Furthermore, 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 computerisation, Computer Vision Techniques or Digitalization is critical to improving and preserving a construction company's performance (Nikmehr et al., 2021; Xu et al., 2021). Several academics believe that computerisation is an organisation's most valuable and vital resource (Ahmad & Ahmad, 2019; Santos, 2020). In contrast, others believe that computerisation is crucial to an organisation's existence (dos Santos et al., 2021).

Accounting Information Systems (AIS) as a main part of CAIS has been a primary strategy for many organisations looking to enhance their organisational performance (Fitriyani, 2019; Trabulsi, 2018). Broadly, CAIS is now recognised as a construction company's performance, and the CAIS strategy is being adopted by a rising number of organisations (Almgrashi, 2020; Tajvidi & Ahmadi, 2021). In addition, scholars have shown that many organisations that implemented CAIS as a corporate strategy have failed to meet their goals and are growing disillusioned with the practicality of CAIS factors (Abdulle et al., 2019; Abdulle, 2019). The emphasis of early CAIS research was on technology as a fundamental key to information flow (Abdulle, 2019; Gofwan, 2022; Wijekoon & Ratnayake, 2020). In addition, practitioners have made significant investments in information technology to support CAIS initiatives (Darshi et al., 2019; Qatawneh, 2020). Unfortunately, many CAIS

initiatives have failed to produce the expected results. Apart from that, Qatawneh (2020) 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.

Organisational innovation is widely regarded as a fundamental barrier to harnessing intellectual resources in the CAIS agenda (AlBastaki & Hamdan, 2022; Li et al., 2018). Innovation refers to the process of conceiving and implementing novel ideas, products, or procedures that generate positive change and value. It involves the ability to transform creative ideas into products, services, or procedures that benefit individuals, businesses, and society as a whole. (Kahn, 2018; Xu, 2019).

Innovation culture, on the other hand, pertains to an organisational culture that supports and promotes innovation. It is a set of values, beliefs, behaviours, and practises that encourage and facilitate the conception and implementation of innovative ideas within an organisation. (Arsawan et al., 2022; Jin et al., 2019). Innovation culture is of the utmost importance for businesses pursuing sustainable growth and market competitiveness. (Martins et al., 2018). A company with a robust innovation culture encourages innovation, experimentation, risk-taking, and collaboration among its employees, empowering them to generate novel ideas and problem-solving techniques.

Scholars have stressed the importance of studying the human factors that play a role in CAIS (Mohamed & Ramli, 2022). Moreover, academics have recognised organisational innovation as a critical aspect of how an organisation handles its computerised operations (Chen et al., 2020). Since culture can act as a barrier or an amplifier of computerised generation and transfer (Duong, 2022), organisations must take into account culture prior to embarking on CAIS projects (Elsharif, 2019). If an

organisation identifies its culture, it can determine how well its CAIS culture and processes match up in a specific business context. Furthermore, the organisation can foster an environment that encourages computerised sharing, which is critical to its success (Zhao & Srite, 2020). The concept of computerisation as a value to construction companies has recently garnered widespread recognition and interest. CAIS is becoming increasingly important in the construction industry, as appropriate computerisation of performance is critical to the industry's existence (Al-Dalaien & Dalayeen, 2018). Nevertheless, formal CAIS deployment in Iraq, especially within the construction industry, is still in its early stages (Buniya, Othman, Durdyev, et al., 2021). As a result, construction companies must better understand the importance of computerisation as a valuable asset in improving their performance and incorporating CAIS into their strategic management schedule to achieve their objectives.

1.2.1 CAIS Strategy

The successful implementation of a CAIS necessitates a well-planned approach, which includes the choice of suitable software and hardware, personnel training, and data protection. Abdulle et al. (2019) discovered that the implementation of CAIS can significantly increase accounting efficacy and decrease accounting errors, particularly in small and medium-sized businesses.

1.2.2 CAIS Culture

The successful adoption of CAIS also requires a supportive company culture. According to research conducted Tajvidi and Ahmadi (2021), IT implementation and use are positively impacted by a culture of trust, openness, and creativity. In addition, Oluwaseun (2018) discovered that employee training and participation in the implementation process positively affect the success of the system.

1.2.3 CAIS Practically

Utilising the system to correctly and effectively handle and report financial data is the practical application of CAIS. According to research conducted by Gardi (2018), the Iraqi auditing process is greatly improved by the implementation of CAIS in terms of financial reporting, auditing, and decision-making. Furthermore, the system needs to be evaluated and improved often to account for changing business requirements. Ashraf et al. (2020) discovered that the accuracy, dependability, and timeliness of financial reporting are positively impacted by routine system examination and improvements. A growing field of study within CAIS is the integration of machine learning and artificial intelligence into accounting systems. Automation of monotonous accounting operations, data quality improvement, and real-time financial data insights are all possible with AI and ML.

For instance, Leonov et al. (2020) investigated the use of AI-based tools in financial statement analysis and discovered that these tools can improve the precision and timeliness of financial reporting. Another area of CAIS research focus is cloud computing. Scalability, accessibility, and cost-effectiveness are benefits of cloud-based systems over conventional on-premises systems. Lutfi (2022) examined the adoption and impact of cloud-based accounting systems in Jordanian SMEs and discovered that these systems enhance financial reporting and decision-making processes.

In conclusion, a well-thought-out strategy, consistent review and improvement, a system-supporting organisational culture, and practical deployment of the system are all necessary for a successful CAIS implementation. The importance of these elements and how they affect the adoption and use of CAIS are stressed in this study.

1.3 Research Problem

CAIS implementation factors as a computer system has attracted many researchers to undergo research in many industries. CAIS has attracted many researchers to undergo research in many industries, as computerisation is recognised as the source of sustainable performance for construction companies. There has been a significant amount of research conducted on AIS, which represents a crucial element for CAIS as it enables the integration of accounting and financial processes into the overall information system. These studies highlight the importance of improving maintenance performance in companies (AlBastaki & Hamdan, 2022; Gofwan, 2022; Rosa & Purfini, 2019). The role of innovation culture in CAIS implementation factors initiatives has been discussed in many studies (Le, Nguyen, et al., 2020; Qatawneh, 2023) since culture can act as an enabler or barrier in CAIS implementation factors programs (Jarah & Almatarneh, 2021), and managing innovation culture in the organisation will enable the organisation to cope with the fast-changing environment. Besides, culture can also play a role in generating high performance (Saad & Abbas, 2018).

On the contrary, organisational innovation has not been proven to moderate the relationship between construction companies' performance and CAIS implementation factors as a part of organisational benefits. None of Previous studies specifically focus on construction companies or CAIS implementation factors. They may provide some general insights into the mediating role of organisational innovation on different aspects of firm performance (Akhter, 2022; AlBastaki & Hamdan, 2022; Gofwan, 2022). However, no known study attempted to examine the relationship between construction companies' performance and CAIS, with organisational culture acting as a mediator. Therefore, this research aims to fill this gap by investigating the role of

organisational innovation as a mediating effect in the relationship between CAIS and construction company performance.

Prior research has looked into the link between firm performance and CAIS (AlBastaki & Hamdan, 2022; Rosa & Purfini, 2019). Prior studies, alongside other relevant research, have demonstrated an intricate relationship between the performance of companies and factors associated with the implementation of Computerised Accounting Information Systems (CAIS). These factors are embodied by the Accounting Information System (AIS) or Information and Communication Technology (ICT), as well as the organisational, technological, and environmental contexts (TOE). The results indicate a persistent and affirmative correlation between these variables (KIRIGHA, 2022; Susanto, 2018). Baron and Kenny (1986) mentioned in their study that when the relationship between the dependent variable (DV) and independent variable (IV) is consistent (which means either positive or negative), a third party as a mediator variable could be chosen between them. Therefore, based on that, the current study takes a new step further to fill a global gap in the literature review by investigating the role of organisational innovation as a mediator variable to be a third party that describes the relationship between the construction companies' performance and CAIS. The majority of organisational innovation research used culture as an independent variable impacting company performance, while some used it as a dependent variable influenced by antecedent variables (Aboramadan et al., 2020; Xanthopoulou & Sahinidis, 2022). The literature shows that one of the most important traits of organisational innovation is its mediating role in enhancing companies' performance, as demonstrated by (AlTaweel & Al-Hawary, 2021; Zhou, Zhou, et al., 2019).

Organisational innovation, for example, is a significant variable, according to Qi et al. (2019), since it acts as a significant mediator in influencing a company's performance. Notwithstanding several theoretical agreements regarding the mediator role of organisational innovation, the researcher is unaware of any previous research that has evaluated the mediator role of organisational innovation on the relationship between construction company performance and CAIS in developed or developing countries.

One of the most complex and dynamic industrial settings is the construction industry. The construction sector accounts for a large portion of the economy in emerging countries like Iraq. Regardless of its economic importance, the construction industry's productivity is consistently lower than other industries like manufacturing or oil. The Iraqi economy has experienced an extraordinary increase in its gross domestic product (GDP) over the last three decades, as evidenced by the World Bank Group and scholarly studies conducted from the years 1990 to 2018 (AL-Shammaria et al., 2020). The construction industry, on the other hand, has completed spectacular projects that were not time, cost, or quality-effective, Furthermore, the construction industry has a bad reputation for poor performance and productivity (Abdel-Hamid & Mohamed Abdelhaleem, 2022; AL-JAF & SAEED, 2020; Mohammed, 2021; Obaid et al., 2019b; Van Tam et al., 2021).

Globalisation is commonly acknowledged as having the highest degree of significance for performance (Naz & Ahmad, 2018). According to a report by Marsh and Guy Carpenter, global construction output is expected to grow by 6.6% in 2021 and 42% by 2030, driven by government stimuli and the demand for residential construction1. The construction industry is also closely linked to other economic sectors such as manufacturing, transportation, and energy.

Computerised Accounting Information Systems (CAIS) are used in the construction industry to manage financial transactions and provide real-time financial information (Gofwan, 2022). CAIS can help companies improve their financial performance by providing accurate financial data that can be used to make informed decisions (Gofwan, 2022; Oduro et al., 2022). Construction organisations are forced to reassess their construction in order to improve quality, productivity, as well as efficiency as a result of increased worldwide competition (Van Tam et al., 2021). As Qatawneh (2020) contended, productivity is the real source of CAIS, and CAIS advantage can result in high performance. Iraqi construction companies will forfeit their competitive advantage in the domestic and global markets as a result of their low performance and productivity.

Public projects, as well as university projects, have adopted a CAIS (Qatawneh, 2020). However, regardless of the presence of prominent computerised accounting information systems, there have continued to be instances of reporting delays, wrong transactions, and report authoring inefficiencies, Moreover, in these initiatives, there have been examples of a vast volume of paperwork, delayed data processing, and, as a result, delays in the generation of management accounts, which could negatively impact performance (Abdulle et al., 2019). However, these are not expected to happen since these projects employed a CAIS. Hence, the researcher is encouraged to evaluate the system's effectiveness in financial reporting related to its effects on construction company performance in Iraq.

The role of CAIS adoption factors and organisational innovation in achieving construction companies' high-performance and concentration companies is widely acknowledged (Jarah & Jarrah; Tilahun, 2019). Furthermore, with the growing relevance of computerisation in the global and modern period, organisations have

begun to recognise the necessity to manage CAIS as a part of their organisational performance criteria and as an organisational asset and also wealth source (Abdulle et al., 2019). In recent years, scholars have emphasised the critical role of performance settings in CAIS through intentional cultural development. The impact of AIS has also been highlighted, specifically in terms of enhancing efficiency and financial reporting (AlBastaki & Hamdan, 2022).

Iraq, similar to developing countries such as Jordan, Zambia, and Nigeria, is considered an underdeveloped country. As a result, the acceptance of the CAIS program in Iraq is moderate because the program is still in its early stages (Munthali et al.; Qatawneh, 2020). Even though CAIS is crucial for the construction sector because of its impact on a company's performance (Marei & Iskandar, 2019), CAIS practices in Iraq are still in their infancy, with most companies still in the initial stages of formal CAIS adoption (Darshi et al., 2019). The level of adoption of AIS within the construction industry of developing countries, such as Saudi Arabia and Iraq, is currently at a nascent stage (Aljobaly & Banawi, 2020), it is critical to figure out which CAIS adoption elements have a major impact on the performance of Iraqi construction firms. As a result, the first research question of this study is: Which CAIS adoption factors (organisation, technology, and environment contexts) have a positive and significant relationship with construction companies' performance?

To keep up with the changing demands of the market, Iraqi construction firms must adopt Computerised Accounting Information System (CAIS) to improve their economic performance (Mahmoud, 2020). CAIS are essential for all types institutes in Iraq because they can enhance the efficiency of administrative decision-making (El-Ebiary & Alawi, 2020). They can also improve the effectiveness and efficiency of internal audits. A study conducted by Gardi (2018) at Zanko bank showed that the

accounting information management system was in a state of 480 concurrent users, the average response time of a data query was 4.3 seconds, and the average (Gardi, 2018).

The government has worked closely with the Iraqi Ministry of Planning to enhance the level of CAIS and skills among construction professionals. Managing CAIS in construction companies as part of the construction sector will assist the government in meeting its objectives. There are many challenges that developing countries face when implementing AIS, CAI, and ICT. Some of these challenges include language barriers, limited infrastructure and skills, lack of funding, and lack of awareness. It's not surprising that CAIS acceptance among Iraqi construction companies is still at a low level (Qian et al., 2021; Serhan, 2020). Previous studies found a significant link between organisational performance and CAIS. However, other studies have shown inconsistent findings, suggesting the effectiveness of CAIS depends on various factors such as internal processes, skilled staff, and integration with other systems. The factors that contribute to a successful implementation of CAIS, as represented by the Technology-Organisation-Environment framework, require a deep understanding of both the organisational context and technological innovations (Seshadrinathan & Chandra, 2021), the present study went a step further by considering the role of innovation as a mediating variable that explains the link between construction company performance and CAIS. innovation has been studied as both an independent variable that influences company performance and a dependent variable that is influenced by certain antecedent variables such as organisational culture, leadership, and strategy (Al-Hawamdeh & Alshaer, 2022; Bokhari & Myeong, 2022; Li & Yu, 2018; Nguyen et al., 2022). innovation has been studied as both an independent variable that influences company performance and a dependent variable

that is influenced by certain antecedent variables such as organisational culture, leadership, and strategy (Wang et al., 2021). Innovation plays a mediating function in improving companies' performance (Jalil et al., 2022). Innovation can be understood as a multidimensional phenomenon whose dynamics are influenced by a diversity of factors both internal and external to the organisation (Favoreu & Carassus, 2019). Innovation advances the technological capabilities of industrial sectors and prompts the development of new skills (Steen, 2020). Innovation "has moved from a consideration to a necessity" for academic libraries operating under the dual pressures of economic contraction and technological developments (Corrall & Jolly, 2019). This significance arises from the fact that its impact is a key mediating component in determining a company's performance. Despite various theoretical agreements regarding innovation's mediating role, the researcher is unaware of any previous research that has examined the mediating role of innovation on the relationship between the performance of construction companies and CAIS. Likewise, the Iraqi construction sector is made up of scheduled time, schedule cost, and required quality, with the preponderance of the firms being construction firms of various sizes, which can have a variety of effects on innovation and company performance. Large organisations with skills, resources, and technological advantages, for instance, have organisational innovation that helps them perform better.

Past studies on the antecedent variables to CAIS, Information, communication and technology (ICT) , accounting information systems (AIS) and/or constructions company performance looked at the impact of numerous elements such as organisation, technology, as well as environment contacts (Abdulle et al., 2019; Gofwan, 2022; Thottoli, 2020). As far as the researcher's knowledge is concerned, no one has looked at the role of innovation culture as a mediating effect in the relationship

between construction company performance and CAIS implementation factors (organisation, technology, and environment contexts). Recent research has proposed that innovation culture should be looked at as a mediation effect rather than an independent variable, particularly in developing countries (Lee et al., 2022). According to a study published in PubMed, specialists in the Iraqi construction industry acknowledge a greater reliance on human capital, with technology innovation culture being regarded as a modest supporting factor in enhancing performance (Buniya, Othman, Sunindijo, et al., 2021). Another study aimed to develop models that will help to assess skills and knowledge needs for the Iraqi construction industry (Alkinani, 2014). An online survey was also conducted to determine the evidence for better understanding the current role of Building Information Modelling (BIM) by engineers and professionals as a tool in the fields of design and construction and its application toward enhancing sustainably built projects in the construction industry in Iraq (Alsaeedi et al., 2021). Because of the high reliance on human resources, innovation may play a role in the relationship between company performance and CAIS factors. This discussion brings up the study's second research question: 'Does innovation mediate the relationship between CAIS and a company's performance?'.

As a result, this study sought to examine the CAIS program with the involvement of innovation as a mediator in construction companies in Iraq. This regards a holistic approach as one of the solutions for the issues faced by construction companies in Iraq, taking into account the need to concentrate on managing the CAIS for construction companies in Iraq. Iraqi construction companies are likely to increase their performance in the worldwide market as a result of this consideration.

The need for a single implementation framework that gives a comprehensive prescription of the aspects that should be considered for CAIS, and construction

companies may be described as a problem statement. The issue is then tackled as follows. Firstly, the possible value of CAIS in construction companies, as well as how its acceptance and execution in the construction sector might contribute to the nation's economic growth. Secondly, the constraints of past comparable studies and why looking into the antecedent causes and their constituent pieces would solve those problems.

1.4 Research Questions

The current study seeks to analyse the relationship between construction companies' performance and CAIS in the Iraqi constructions sector based on the criteria mentioned in the problem statement and answers the subsequent questions:

1. Do CAIS implementation factors (organisation, technology as well as environment contexts) have a positive relationship with construction companies' performance?
2. Does innovation mediate the relationship between CAIS implementation factors and construction companies' performance?
3. What is the framework through which the adoption of CAIS can lead to construction companies' performance in Iraqi construction companies?

1.5 Research Objectives

To answer research questions, the present research has set the following objectives:

1. To study the relationship between construction companies' performance and CAIS implementation factors.

2. To demonstrate the mediating effects of innovation culture on the relationships between CAIS implementation factors and the performance of construction companies.
3. To develop a framework for the successful adoption of CAIS with certainty on construction company performance by Iraqi construction companies.

For Iraqi building companies to perform better, CAIS must be adopted effectively. CAIS can boost the effectiveness, accuracy, and timeliness of financial reporting and decision-making processes, thereby boosting performance (Almgrashi, 2020; Dithebe et al., 2019). The adoption of CAIS must also include success-based adaptation. It refers to a company's ability to adapt and make the necessary modifications to ensure the system's successful deployment and use (Abdulle, 2019; Hertati et al., 2020).The association between CAIS implementation factors and the performance of building companies is also found to be mediated by innovation culture. Because creative CAIS utilisation helps construction organisations to recognise and seize new opportunities, performance can be increased (Demirdöğen & Zeynep, 2021; Lai & Marisa, 2021). In order to ensure the performance of construction companies in the Iraqi construction industry, a framework for the successful adoption of CAIS is required. The framework should account for organisational, technological, and environmental contexts, as well as the mediating effects of innovation culture.

1.6 Research Scope

The construction companies that work with all public universities in Southern Iraq are the focus of this research since they have the greatest demand for CAIS and have previously implemented IT. Previous IT implementation provides valuable

insights into the success and challenges of implementing CAIS and helps researchers understand the factors that affect its implementation (El-Adaileh & Foster, 2019).

Since data collection and analysis were done at the management level, the units of analysis for the current study were the company's Directors, Chief Executive Officers (CEOs), or senior managers of construction companies that deal with all public universities in Southern Iraq.

1.7 Significance of the Study

The findings may aid construction organisations in determining whether or not CAIS implementation factors will be successful in improving the organisation's performance with respect to present organisational innovation. This is critical since firms invest a large amount of time, money, and employees in CAIS programs (AlBastaki & Hamdan, 2022; Almgrashi, 2020). A deeper knowledge of the relationship between innovation culture and CAIS may aid construction company owners as well as top management in increasing organisational capabilities and making informed decisions about how these resources will be used to meet organisational goals, including performance. As the worldwide economy becomes more computerised, managers and owners must successfully implement strategic business initiatives to ensure the long-term viability of their firms.

Further understanding of the inter-relationships between CAIS, organisational innovation, and companies' performance can assist managers in implementing CAIS within the current innovation culture type to achieve performance. Furthermore, such knowledge gives a theoretical foundation for scholars to pursue a better understanding of CAIS in the future. The findings on the interrelationships between CAIS, organisational innovation, and company performance could serve as a strategic guide

for policymakers and Iraq construction industry leaders in leveraging CAIS within the context of an innovation culture to resolve the severe issue of low productivity and performance in the Iraq construction industry.

1.8 Operational Definition for Keywords

Mediating Effect : A statistical link between two variables is said to have a mediating effect if the impact of one variable, known as the independent variable, is transmitted on to the other variable, known as the dependent variable, via an intermediary variable, known as the mediating variable (Horiuchi et al., 2018; Pradhana, 2020; Walters, 2019).

Moderating Effect: There is a moderating effect whenever there is a third variable that has an influence on the relationship between an exogenous variable and an endogenous variable. This third variable is known as the moderator (Haider et al., 2023; Lim, 2020; Sang et al., 2022).

Organizational Performance: Performance can be defined as the extent to which an organisation is successful in achieving its aims and targets (Eze & Idiake, 2018; Kamble & Gunasekaran, 2020; Taouab & Issor, 2019).

Gross Domestic Product (GDP) : The gross domestic product (GDP) of a nation is a measurement of its economic performance that is computed as the total value of goods and services generated inside its boundaries during a certain amount of time (Agarwal, 2018; Coscieme et al., 2020; Fatmawati, 2022).

TOE (Technology-Organisation-Environment) Framework: The TOE Framework is a theoretical framework for examining the relationships between technology, organisational variables, and environmental factors that influence the adoption and use of new technology in businesses. The purpose of this analysis is to

determine what factors have the most impact on these adoption and usage decisions (Al Hadwer et al., 2021; Malik et al., 2021; Muhamad et al., 2021).

Competing Values Framework (CVF): The Competing Values Framework (CVF) is a concept that is used to examine a company's culture and identify its strengths and flaws across four quadrants: the clan, the ad hoc, the market, and the hierarchy (Botti et al., 2018; Otike et al., 2022; Zeb et al., 2021).

WARP PLS: An innovative method for estimating structural equation models, WARP PLS combines partial least squares regression (PLS) and weighted least squares regression (WLS) (Kock, 2019a; Purwanto et al., 2021a; Sholihin & Ratmono, 2021).

Structural Equation Modelling (SEM): The structural equation model, or SEM, is a method of statistical analysis that is used to test hypotheses concerning the relationships between variables (Hair et al., 2019b; Thakkar, 2020).

Partial Least Squares (PLS): PLS is a statistical method for modelling the relationships between the variables that are observed and the latent variables that are not observed (Becker et al., 2023; Kock, 2019b; Purwanto, 2021).

CAIS implementation factors: These are the essential factors to take into account, each of which plays a significant part in determining whether or not a computerised accounting information system (CAIS) is successfully implemented (Almgrashi, 2020). These components span a wide variety of important variables, including those relevant to the technological infrastructure, user acceptance, training standards, and constant support systems, all of which are vital for the effective operation of the CAIS.

Innovation culture: An organization's innovation culture its shared beliefs, values, traditions, behaviours, and practices helps foster innovative problem solving and new product development (Li & Liu, 2022). It includes organisational principles

and practises that allow workers to innovate, take calculated risks, collaborate across teams, and adapt to new situations (Muchiri et al., 2020). Flexibility is key to innovation. Innovation friendly cultures encourage creativity, experimentation, education, and career progression (Kusumawardhani & Sya'roni, 2022).

Culture: A given group or organization's culture can be defined as the set of shared beliefs, values, rituals, behaviours, and social practises that serve to distinguish it from other similar groups or organisations (König, 2020). Within a specific social or organisational setting, it exerts a significant impact on the thoughts, deeds, and interactions of individuals. The culture of an organisation has a substantial influence on a range of aspects, including performance, communication patterns, decision-making procedures, and the overall atmosphere of the workplace.

1.9 Organisation of the Thesis

To present an overview of this research, the current chapter introduces the framework of the study, including background, objectives, and significance. The remaining portions of the thesis are as follows to clarify the research's other insights:

Chapter Two: The literature review chapter provides a comprehensive analysis of the prior research on the constructs underpinning this study, including the Iraqi Construction Industry, Computerised Accounting Information System (CAIS), and construction companies' performance. Additionally, the chapter investigates the major conceptual underpinnings of this study, drawing on past research to inform our approach.

This chapter places particular emphasis on the topic of organisational innovation, which is investigated in depth through a critical analysis of relevant literature. Significant knowledge gaps regarding organisational innovation are

identified through an exhaustive synthesis and analysis of prior research in this field, culminating in the development of a research framework. This project aims to make a significant contribution to the existing corpus of knowledge on this subject while enhancing our understanding of the effective use of organisational innovation in the Iraqi Construction Industry.

Chapter Three: The chapter on the theoretical framework and hypotheses development discusses how hypotheses are established and outlines the conceptual framework used in this study. The research technique chapter begins with an explanation of the research paradigm and how it was chosen. The research process, research design, pilot study, instrument development, as well as data collection protocols are also discussed in this chapter. The chapter also discusses selecting a data analysis technique and how to perform data analysis operations.

Chapter Four: The findings of the hypothesis testing are presented in the analysis and results chapter, which discusses structural equation modelling employed to analyse the data. The chapter concludes with a discussion of the findings in light of the study's goals.

Chapter Five: The chapter on discussion, implications, and conclusion summarises the findings, analyses the ramifications, underlines the research's theoretical as well as practical contributions, explains the research's limits, and makes recommendations for future research.

Chapter Six: The purpose of this chapter is to examine the present study's conclusion by expanding on the research objectives outlined in Chapter 1 and the outcomes obtained via the analysis. Furthermore, this chapter discusses the study's contributions, specifically contribution to computerising and contribution to the practice.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive review of literature relevant to CAIS in relation to the construction industry in Iraq. The chapter examines the historical and theoretical components of CAIS, followed by a discussion of the CAIS and organisational culture models such as Denison and Schein's model, as well as the Competing Values Framework (CVF). The chapter also presents empirical research related to CAIS implementation variables, innovation culture, and the performance of construction companies. Additionally, this chapter explains literature associated with organisational culture and innovation as an aspect of organisational culture. It reviews literature on organisational culture using the Denison model, Schein's levels of cultural analysis, and hierarchy culture type. Other items considered in this chapter incorporate a literature review on organisational culture in relation to the market, clan, adhocracy, and balanced cultures. This chapter also examines research on innovation culture as a mediating factor in the relationship between CAIS and the performance of construction companies. Finally, this chapter presents hypotheses development and conceptual framework.

2.2 Iraq Construction Industry

There are a number of challenges that the Iraqi construction sector must overcome, including time and expense overruns, as well as poor quality (Abbas & Burhan, 2022; Ahmed & Altaie, 2021). These problems have made it more difficult for the nation's economy to expand. Nevertheless, the building industry is essential to the growth of the economy as well as the accomplishment of societal goals.

Establishing performance indicators, ranking those indicators according to their significance, and monitoring project progress during the execution phase are all things that project management should do in order to improve performance. Especially while working in factors that are prone to instability, building project managers need to have a clear vision and objective (Jaber et al., 2020; Pariafsai & Behzadan, 2021).

Poor performance in the Iraqi construction industry can be attributed to a number of factors, including a lack of contractor expertise presents bad scheduling, delays, poor working conditions, inadequate planning, antiquated technology and equipment, shifting costs, and unskilled workforce (Abbas & Burhan, 2022; Kim et al., 2020; Obaid et al., 2019a). The complexity of construction companies is due, in large part, to the many different roles that are played throughout the construction procedure by stakeholders such as owners, consultants, regulators, and contractors. These organisations are crucial to the functioning of culture, and the contributions they make to the construction sector drive the growth of the economy(Abbas & Erzaij, 2020; Mahmoud, 2020; Zamim, 2021). It is necessary to address poor project management practises and document construction faults in order to foster economic growth and prevent future occurrences of similar problems.

The expansion of the economy and the performance of the construction sector can both be measured by the level to which construction, such as roads, buildings, and bridges, can be improved. In addition, the building industry helps contribute to the expansion of communities and provides a large number of chances for employment. As a direct consequence of this, the construction sector is absolutely necessary to the development of the national economy and the achievement of societal objectives (Fulford, 2019; Hatema et al., 2022). The performance of a project in the construction sector is evaluated based on a number of criteria, including adherence to the budget,

timely completion, conformity to the specifications, and overall customer satisfaction. Uncertainty in procedures, financial plans, and technological advancements are elements of the construction sector, and this is especially true in developing nations (Assaad et al., 2020; Zhong et al., 2018). As a result, nations whose socioeconomic growth is more sluggish need to put the strategies into practice, which will improve and monitor the performance of the construction sector.

There are a number of countries in which the construction sector makes a substantial contribution to the gross domestic product (GDP). Additionally, the construction sector has a close connection to civil engineering, which encompasses the planning, design, and process for constructing structures (Ustinova & Sirazetdinov, 2020). Effective project management and strong leadership are essential throughout the entirety of a project's life cycle in order to guarantee the on-time and error-free completion of the project in accordance with the needs of the customer. The performance of the construction sector is also influenced by the performance of national economies, and in order for companies to thrive, they need to adapt to an environment that is constantly changing. Cost, timing, and product quality are the three factors that determine how successful a construction company is (Dithebe et al., 2018). The success of a construction project is directly impacted by a variety of factors, including the work done by skilled employees, competent technical professionals, and unskilled labourers. During the process of carrying out the project, stakeholders lay an emphasis on quality (Hijazi, 2021; Hussain et al., 2020). Documenting problems and mishaps that occur throughout construction tasks is necessary in order to gain insight from the past, which is essential for enhancing overall performance.

Performance measurement in the construction sector has moved beyond financial indicators as a direct result of the intense rivalry that exists and the rapid

growth of technology. The performance of building companies in Iraq is hindered because of a lack of site management, qualified workforce, adequate supervision, equipment availability and dependability, and effective leadership (Hijazi, 2021; Wawak et al., 2020). The performance of a construction project might be hindered by impediments such as low quality, unfavorable working environment, and insufficient safety practises (Abas et al., 2020). Performance assessments have been a problem in the construction and building companies for decades, which is a concern that is crucial to the success of a project since the selection of contractors is vital to the success of a project. The success of a construction project is determined by a variety of factors, such as the contractual relationships between the parties involved, the procedures of the project, the work force, the materials, and the characteristics of the project. Performance considerations include things like cost, time, and quality, as well as things like owner satisfaction, environmental effect, and sustainable development.(Abas et al., 2020).

The construction sector in Iraq faces a number of challenges, including a lack of suitably qualified labourers and project management, a paucity of materials, rising prices, limited resource availability, and unstable political situations (Hamza et al., 2022; Jaber, 2019; Mahmoud, 2020). Finding solutions to these problems before beginning work on a project guarantees both the happiness of the company's owners and a productive outcome. The public, consumers, owners, contractors, and developers are all aspects that might influence the performance of a construction project. The factors that go into performance evaluation include quality, time, and cost. The ability to work together as a team, strong leadership from management, ongoing improvements to quality, and sufficient training all have an impact on performance. Performance is affected by a number of factors, including cost, owner satisfaction,