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# **A Strategic Alignment Perspective of Public-Sector Organisations in Saudi Arabia in the Digital Transformation Age (Quantitative Study)**

## **Full Research Paper**

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## **Abstract**

Public-sector organisations face several challenges in their adoption of digital transformation strategies to achieve strategic goals and objectives. The aim of this study was to assess the determinants of business value related to information technology projects in public-sector organisations from a business-information technology strategic alignment perspective. This study utilised a quantitative design drawing data from 198 surveys. The main findings showed a positive, significant, and impactful linkage between Information System (IS) Governance Mechanisms and Top Management characteristics. Both are essential antecedents of the intellectual dimension of Business-IT Strategic Alignment and the quality of IT Project Planning. The findings also showed a positive relationship between Business-IT Strategic Alignment and the quality of IT Project Planning, which fully mediates the impact of IS Governance Mechanisms and Top Management characteristics on Organisational Performance, Service Innovation, and Operational Excellence.

**Keywords** Business strategy, IT strategy, alignment, public-sector organisations, IT project, business value

## 1 Introduction

A national e-Government strategy has been implemented by the Saudi Arabian government to enhance public-sector service delivery and technology-based operations (Al Shehry et al. 2009; Yasser 2016). However, there have been several technological, organisational, cultural, and social challenges caused by the adoption of this strategy. Such challenges and issues must be considered carefully by the Saudi government given the limited research evidence and insights on this issue to guide the successful to adoption of e-government services in SA (Al Shehry et al. 2009). Although some public-sector organisations have delivered IT projects on budget and on time, few have reported how they measure and identify the benefits supposedly arising from the projects and project performance (Gerow et al. 2014; Ilmudeen et al. 2019; Wu et al. 2015)

Alignment between business processes and strategies may be regarded as a foundation for achieving business objectives. Indeed, Business-IT strategic alignment more specifically helps to achieve congruence in the IT project plan over time by supporting the effective translation of strategies into actions (Schlosser et al. 2015). The pursuit of alignment between IT and business strategic objectives therefore reflects management's view on how IT can be used to create business value and improve performance outcomes (Ilmudeen et al. 2019). Notably, IT project planning techniques are regularly applied to tasks associated with planning and executing operational changes to create value and improve the efficiency and competitive position of the business (Too and Weaver 2014). Furthermore, strategic alignment research to date has identified IT project planning as a source category of Business-IT strategic alignment. Indeed, the quality of IT project planning is considered as a key IT-enabler of organisational outcomes (Kearns and Sabherwal 2006). This has empirical support, with research evidence showing that Business-IT strategic alignment can have a positive impact on the quality of IT project planning, which, in turn, contributes to improved organisational performance. It is therefore not surprising that strategic alignment as a priority issue among business executives is well established in the literature (Gerow et al. 2014; Tallon 2007; Wu et al. 2015)

Although prior research has proposed a set of useful theoretical viewpoints for understanding strategic alignment, the role of quality IT projects in the context of strategic alignment assessment is now the focus of attention for many researchers. Therefore, this study contributes additional insights to the field by drawing on prior studies on strategic alignment to examine their data and models to answer the following research questions:

1. What is the impact of IT governance mechanisms on Business-IT strategic alignment in the context of IT projects?
2. What are the effects of top management (TM) characteristics (e.g. TM support, TM knowledge of IT, TM participation in business planning, and participation in strategic IT planning) on Business-IT strategic alignment and IT governance mechanisms in the context of IT projects?
3. What is the impact of Business-IT strategic alignment on the quality of IT project planning and that of organisational characteristics on this relationship?
4. What is the impact of the quality of IT project planning on IT project outcomes (organisational performance, service innovation, and operational excellence)?

### 1.1 Significance of the Research Problem

Alsudiri et al. (2013) identify the alignment of business and IT strategic objectives as significant factors that influence the success of IT projects. Governments and public institutions across the world continue to be concerned about the failure of IT projects in public organisations (Al-Hujran et al. 2015;; Alsudiri et al. 2013). However, research findings indicate that 60 to 90% of companies fail to adequately adopt enterprise resource planning (ERP) systems. Moreover, it has been found that around 90% of ERP projects are not completed on time or within the specified budget (Abouzahra 2011). A leading cause of project failure is a misalignment between the IT project and the implemented business strategy (Alsudiri et al. 2013).

In Saudi Arabia, the successful implementation of IT projects is a matter of specific importance. At present, many technological, social, cultural, and organisational challenges are faced by the national government as it implements the National e-Government Strategy. Despite Saudi Arabia being recognised as a high-income country, very little existing research has investigated the successful implementation of digitalised government services (Al Shehry et al. 2009). Establishing strong alignment between public-sector organisational goals and the projects they are tasked with implementing is a significant challenge related to the adoption of the e-government initiative (Aldraehim et al. 2013; Al Shehry et al. 2009). Very few studies have explored how companies can effectively achieve this alignment between IT and business strategies when setting up new IT projects. For this reason, no standard, practical approach to test this alignment at the strategic planning level has been developed in Saudi Arabia (Alshehri and Drew 2010; Al Shehry et al. 2009).

The present research is thus important because it presents current data and results relevant to the business/IT strategy alignment/misalignment challenges faced by public-sector organisations in both Saudi Arabia and other developing countries. This paper serves as a valuable contribution to research into the topic and may be used by Saudi public-sector organisations tasked with implementing the national strategy in a way that enhances public-sector efficiency and productivity and works towards the development of a diversified economy.

## 2 Literature Review

A survey carried out by Preston (2014) found that Business-IT alignment considered to be the third biggest concern for top management in organisations. Aversano et al. (2012) define business operations and IT system alignment as ‘the degree to which the mission, objectives, and plans of the organisation are supported by the information technology used. In other words, alignment refers to the ‘fit’ between business-IT strategies and business-IT infrastructures (Henderson and Venkatraman 1993). Throughout relevant research, it has been found that successful Business-IT strategic alignment occurs when the actions, objectives and processes of a company or organisation are in harmony with the information systems that have been implemented to support them (Aversano et al. 2012). Aversano et al. (2012) point out that, at a functional level, it is crucial to improve the alignment between existing company strategies and IT systems to enhance the effectiveness of software support. As such, it is believed that the effectiveness of IT systems is improved when alignment between the two strategic domains is high. This can ultimately enhance organisational performance (Aversano et al. 2012). Research findings have also shown that IT planning and shared domain knowledge such as TM knowledge of IT, TM participation in business planning, and TM participation in strategic IT planning play a key role in assessments of the impacts of contextual factors on Business-IT strategic alignment (Kearns and Sabherwal 2006; Turel et al. 2017)

To achieve strategic IT goals, an organisation’s IT governance practices must be effective (Wu et al. 2015). For this reason, company directors and TM teams tend to focus specifically on optimising IT governance protocols and practices (Turel et al. 2017). Wu et al. (2015) developed a model to determine the impact that governance protocols and practices have on IT strategic alignment and ultimately, on organisational performance. The model was developed based on the Resource-Based View (RBV) and IT governance. Through the application of this model, they found a “significant, positive and impactful” relationship between IT governance practices and strategic alignment in that the formalised processes around strategic IT decision making and the relational practices among organisational executives, IT managers and employees are crucial for achieving and maintaining alignment between business and IT. They also found the same relationship between strategic alignment and organisational performance. That is, strategic alignment has a mediating effect on the way in which IT governance mechanisms impact organisational performance and, therefore, organisational value (Wu et al. 2015). Moreover, Turel et al. (2017) conducted a study to identify the key factors influencing the positive relationship between IT governance and enhanced organisational performance. The researchers referred to the findings of two empirical studies and concluded that strategic alignment has a mediating effect on board-level IT governance and thus ultimately on organisational performance (p. 117).

Many researchers and business practitioners have emphasised the importance of aligning business and IT strategies. For example, Reynolds and Yetton (2015) found that organisations and company projects must focus on ensuring alignment between the desired service improvements and the IT systems implemented to achieve them. This can significantly increase the return on investment (ROI). Many business executives and government officials have also sought to obtain a thorough understanding of the specific needs of IT-enabled businesses and operations but have failed to do so. To improve the quality of services offered to citizens, governments often rely on advanced technology systems to operate their organisations and agencies. However, they usually fail to make the organisational changes needed to ensure that the system’s optimal effectiveness. This can result in misalignment between organisational objectives and IT projects – an issue which Al-Shehry et al. (2009) has as a major challenge faced by the Saudi Arabian government when implementing the new e-government initiative.

Moreover, IT governance in an organisation generally, along with other factors including organisational structure and organisational culture can contribute to the misalignment between Business and IT strategies. Such misalignment typically emerges when there is a lack of common understanding and/or approach between business and IT managers on the processes for achieving performance improvement and competitive advantage (De Haes and Van Grembergen 2015). In turn, the structure of the organisation has a critical role in how alignment between the strategic goals and objectives of the organisation is visualised and communicated (De Haes and Van Grembergen 2015). Moreover, the culture within the organisation has a critical role in generating creating value around the strategic goals and commitment to their achievement (Avila and Garcés 2018). As such, any weakness or breakdown in the capability of governance to utilise the structure and culture of the organisation effectively to achieve outcomes can potentially contribute to

Business-IT strategy misalignment (Avila and Garcés 2018; De Haes and Van Grembergen 2015). Conversely, an organisational structure with robust systems and infrastructures in place to support the coordination and pursuit of strategic goal and objectives may help to achieve Business-IT strategic alignment. This is because the pursuit of strategic alignment is more likely supported by effective distributions of power, communication channels, and clearly defined roles and responsibilities of employees (Nene and Pillay 2019). Similarly, an organisational culture that not only values collaboration and cooperation between different departments, but also supports employees with rules and protocols to achieve such collaboration, will likely facilitate alignment between Business-IT strategic objectives (Al Shehry et al. 2009).

A further problem affecting the alignment/misalignment between organisational objectives and IT systems is that many executive employees tasked with making important IT decisions are not sufficiently knowledgeable about technology (Gerow et al. 2014). Executive staff including Chief Executive Officers (CEOs) and Chief Financial Operators (CFOs) are usually in charge of making the most important IT decisions. They tend to make their decisions based on advice given by contractors and vendors. Despite CEOs and CFOs being aware that implementing different software and data mining processes can generate increased earnings, the actual results of this are hindered by their poor knowledge of the IT systems being implemented (Aversano et al. 2012). Nonetheless, when seeking assistance from IT professionals, they must be sure that the latter clearly understands the company's operational needs. If not, IT organisations will be unable to successfully implement technology solutions that meet their business requirements. This will ultimately result in the failure to align IT strategies with organisational goals (Krotov 2015).

Transformation of the Saudi Arabian economy over recent years has been largely reliant on IT. In the Saudi Vision 2030 initiative set out by the Ministry of Economy and Planning (2017), the long-term economic plan to move away from economic dependence on oil has been presented. It is estimated that the implementation period will last approximately 15 years. Moreover, all major economic sectors in the country will be affected by the regulatory, budgetary, and policy changes laid out in the initiative. Technology will thus be a key component for effectively implementing the complex economic transition envisioned in the initiative. As far as national revenue is concerned, the Saudi government has put forward a plan to increase non-oil government revenue from SAR 163 billion (US\$43.5 billion) to SAR 1 trillion (US\$267 billion) by 2030 (Ministry of Planning and Economy, Saudi Arabia 2017).

Public-sector organisations in Saudi Arabia will be significantly impacted by the Vision 2030 initiative. Such organisations must ensure that their digitisation plans align with the Vision 2030 goals to ensure improvement in the quality of government services (such as education, healthcare and public security). ICT solutions will play a pivotal role in this. Taking this into account, key industries and sectors across Saudi Arabia must strive to facilitate the government's strategy and to implement technological solutions to enhance productivity and market competitiveness.

When investigating strategic alignment, several different theoretical perspectives have been employed. Two key examples include the RBV and the Dynamic Capability (DC) approach. Barney (1991) developed the RBV which that can be used by all concerned parties to gain a clearer understanding of a company's competitive advantage. To generate and sustain competitive advantage, a company must use resources that are rare, valuable, inimitable and non-substitutable (Barney 1991). The RBV has thus been widely employed throughout IT-related research to determine which factors can improve organisational performance (Ravichandran et al. 2005). For example, the RBV was applied by Park et al. (2017) to conceptualise internal and external IT governance, who then put forward three types of IT governance alignment for companies to use to evaluate their performance. They concluded that the implementation of a sequential alignment structure can significantly enhance operational efficiency (Park et al. 2017).

### 3 Hypothesis Development

IT governance is understood as the management and regulation of the IS used in an organisation to achieve its objectives. These objectives typically include improving alignment between IT with business goals, delivering IT value to the organisation, and mitigating IT risks to business performance. IT governance can be deployed using a mixture of organisational structures, processes, and relational mechanisms (De Haes and Van Grembergen 2015). Studies have demonstrated the mediating effect that IT governance mechanisms can have on the relationship between Business-IT alignment and organisational goals (Turel et al. 2017; Wu et al. 2015). Based on these findings, this study proposes the following hypothesis:

H1: IT governance mechanisms has a positive significant impact on Business-IT strategic alignment.

Business-IT strategic alignment is the concern of executives and IT managers in organisations, globally (Gerow et al. 2014). Moreover, it has long-been acknowledged that the behaviour of TM is a significant factor of influence in the processes and outcomes of project planning and implementation (Hornstein 2015). In terms of the relationship between IT governance mechanisms and Business-IT strategic alignment, this is typically framed around the idea that the former has a central role in the way that the organisational structures

and processes produce the latter. Therefore, the capacity of TM to 'control' how the structures and processes influence the formulation and implementation of the IT strategy – through the provision of support, application of knowledge, and/or general participation in the processes – can have a mediating effect on the relationship (Wu et al. 2015).

Moreover, research evidence shows supportive versus authoritarian participation by TM in the strategic and business planning around IT governance can positively or negatively moderate the relationship between IT governance mechanisms and Business-IT strategic alignment, respectively (Turel et al. 2017). Based on these findings, this study has formulated the following hypotheses:

H2a: TM participation in business planning has a moderating effect on the relationship between IT governance mechanisms and Business-IT strategic alignment.

H2b: TM participation in business planning has a positive significant impact on Business-IT strategic alignment.

H3a: TM participation in IT strategic planning has a moderating effect on the relationship between IT governance mechanisms and Business-IT strategic alignment.

H3b: TM participation in IT strategic planning has a positive significant impact on Business-IT strategic alignment.

H4a: TM support has a moderating effect on the relationship between IT governance mechanisms and Business-IT strategic alignment.

H4b: TM support has a positive significant impact on Business-IT strategic alignment.

H5a: TM knowledge of IT has a moderating effect on the relationship between IT governance mechanisms and Business-IT strategic alignment.

H5b: TM knowledge of IT has a positive significant impact on Business-IT strategic alignment.

Strategic alignment research to date has identified IT project planning as a source category of Business-IT strategic alignment. Indeed, the quality of IT project planning is considered as a key IT-enabler of organisational outcomes (Kearns and Lederer 2006). This has empirical support, with research evidence showing Business-IT strategic alignment can have a positive impact on the quality of IT project planning, which, in turn, contributes to improved organisational performance (Kearns and Sabherwal 2006). Therefore, this study has formulated the following hypothesis:

H6: Business-IT strategic alignment has a positive significant impact on the quality of IT project planning.

Prior studies (e.g., Roberts et al. 2016) have reported the potential for organisational factors such as identity, culture, structure, and entrepreneurial orientation to impact the business value of IS. Regarding organisational structure, governance mechanisms within an organisational structure have been found to mediate both the financial performance of the organisation (e.g. Shafie et al. 2018) and the success (or otherwise) of IS systems and IT project outcomes (Hughes, Rana and Dwivedi 2020). Regarding organisational culture, links have been demonstrated in the research between the innovativeness of the organisational culture and the successful implement of IT projects (Ilmudeen et al. 2019) and the achievement of competitive advantage (Ali Taha, Sirkova and Ferencova 2016). Drawing on these findings, the following hypotheses have been set forth:

H7a: Organisational structure will moderate the relationship between Business-IT strategic alignment and the quality of IT project planning.

H7b: Organisational structure has a positive significant impact on the quality of IT project planning.

H8a: Organisational culture will moderate the relationship between Business-IT strategic alignment and the quality of IT project planning.

H8b: Organisational culture has a positive significant impact on quality of the IT project planning.

Recent research by Barnes (2017) reported an association between the quality of IT project planning and improvements in key business strategy outcomes including financial performance and customer satisfaction rates. Previous studies have also identified a positive link between Business-IT strategic alignment and organisational outcomes (Kearns and Sabherwal 2006; Tallon 2007; Wu et al. 2015). For example, Kearns and Sabherwal (2006) applied a knowledge-based approach and found that Business-IT strategic alignment has a positive significant impact on the quality of IT project planning which, in turn, has a significant positive impact on organisational performance. Drawing on the above discussion, the following hypotheses have been formulated in the context of Business-IT strategic alignment:

H9: The quality of IT project planning has a positive significant impact on organisational performance.

H10: The quality of IT project planning has a positive significant impact on service innovation.

H11: The quality of IT project planning has a positive significant impact on organisational operational excellence.

Drawing on the above discussion, a research model was developed (see Figure 1)

## 4 Methodology and Study Design

This research undertook an analysis of the key IT-related factors impacting business value. To do this, the Business-IT strategic alignment perspective was used, with the key focus being on public-sector organisations in Saudi Arabia. Key aspects of strategic alignment were investigated to determine their impact on business and IT performance in the chosen government organisations. The focus of the analysis was on the key factors driving Business-IT alignment. These factors related to IT governance mechanisms, TM characteristics, organisational characteristics, and the quality of IT project planning. The extent of Business-IT strategic alignment in the public-sector organisations was determined by identifying practices and the overall maturity of the alignment.

Quantitative research methods were used in the present study to investigate how Business-IT strategic alignment perspectives can be used to explore the different aspects of strategic alignment. A survey was carried out to identify and assess the key factors of business value and its relationship with IT project success through Business-IT strategic alignment. Cooper et al. (2012) explain that the proposed method gives researchers the ideal opportunity to explore the relevant research aspects across all public-sector organisations. It also provides an opportunity to gain more profound insights into the status of the topic under investigation (Cooper et al. 2012).

The survey tool consisted of latent items to be rated using a 7-point Likert-scale (1 = strongly disagree, 7 = strongly agree). The survey was created based on the guidelines put forward by Henderson and Venkatraman (1993), Johnson and Lederer (2010), Kearns and Sabherwal (2006), and Wu et al. (2015). The survey was administered online via the Qualtrics platform.

The survey was administered in both English and Arabic. Initially, the survey tool was administered to 15 participants in a pilot test, after which feedback was sought from the participants to ensure the instructions and items were clear, and that the implementation process was practical. All feedback provided by the pilot test participants was reviewed and changes were made as necessary. Moreover, the proposed study was reviewed by The Human Research Ethics Committee (HREC) (Application 2018/277) who gave approval for the research on the basis that it complied with the National Statement on Ethical Conduct in Human Research.

### 4.1 Data collection

Data were collected from 6 August 2019 to 15 October 2019. The survey was distributed via official emails the Saudi Arabia e-Government Program, "Yesser". The survey was conducted using a random sample across 170 public-sector Organisations in Saudi Arabia. 148 of the organisations returned 450 final responses, but only 198 were considered as completed. As identified in the 2016 directories published by Yesser, 170 public-sector organisations were randomly selected, and this sample was considered an appropriate target for the population in this study (E-Government Program - Saudi Arabia 2016). Based on Yesser, the organisations were classified into 17 sectors, and within these sectors were 170 organisations (2016). Of the 198 usable responses most, participating organisations were from the Education sector (28%), and 14% were from the Health sector. The demographic information of the employee participants working at these organisations showed that the majority (86%) were male (14% were female), with an average age of 35 years and with an average work experience of 15 years. Regarding the participants' qualifications, 41% held a master's degree, and 1.53% had only a high school certificate. In addition, most participants (13%) held the job title of Business Department Manager, but 44% of participants did not disclose their job title.

## 5 Data Analysis and Results

A theoretical model (see Figure 1) was used to explain organisational performance, service innovation, and operational excellence. In the proposed measurement model, reflective and formative indicators are included. Reflective indicators may be regarded as a representative sample of all potential items that exist within the conceptual domain of the construct. In other words, they indicate that the items reflect the same construct. By contrast, formative indicators are used to construct linear combinations. No correlated indicators (reliability or validity statistics) are required for formative measurements, and should only be used in reflective measurement models (Sarstedt et al. 2016). Two exogenous (independent) variables are used in the present study; namely, TM characteristics, and IS governance mechanisms. The construct thus consists of formative indicators. Additionally, five endogenous (dependent) variables are employed; namely, Business-IT strategic alignment, quality of IT project planning, organisational performance, operational excellence, and service innovation. Lastly, organisational characteristics is included in the study as a moderating variable.

The latter’s moderating effect on the relationship between Business-IT alignment and quality of IT project planning was examined. In addition, the moderating effect of TM characteristics on the relationship between IT governance mechanisms and Business-IT strategic alignment was investigated.

### 5.1 Measurement Model Assessment

The theoretical measurement model consisted of seven constructs with 54 items. Indicator reliability was assessed based on the outer loadings of each latent variable. Outer loadings should be at least 0.70 for an item to be retained. Results of the PLS-SEM estimation using Smart-PLS 3.2.8 indicated the loadings of all 54 items. Internal consistency reliability was also assessed using Cronbach’s alpha, DG-rho, and composite reliability. All constructs are recommended to exceed 0.70 for each of the assessment measures. Convergent validity was measured using the average variance extracted (AVE). This must be at least 0.50 to indicate that the construct explains more than half of the variance of its indicators. All constructs met the thresholds, thus confirming the reliability and validity of the constructs (Table 1):

Construct	Cronbach's Alpha	DG -rho	Composite Reliability	Average Variance Extracted (AVE)
Business-IT Strategic Alignment	0.926	0.930	0.948	0.820
IT Governance	*(1)	1.000		
Operational Excellence	0.926	0.930	0.953	0.872
Organisational Performance	0.928	0.930	0.944	0.736
Organisational Culture	0.947	0.952	0.956	0.732
Organisational Structure	0.968	0.973	0.971	0.551
Quality of IT Project Planning	0.935	0.936	0.950	0.793
Service Innovation	0.881	0.901	0.914	0.683
TM Knowledge	0.937	0.939	0.948	0.693
TM Participation in Business Planning	0.897	0.901	0.936	0.829
TM Participation in Strategic IT Planning	0.936	0.938	0.952	0.797
TM Support	0.901	0.906	0.927	0.717

\*(1) Formative measurements do not require correlated indicators (reliability and validity statistics) whose use, from a conceptual perspective, should be restricted to reflective measurement models (Sarstedt et al. 2016).

*Table 1. Construct reliability and validity*

### 5.2 Structural Modal Assessment

Table 2 describes the relative contribution of each item to the formation of the construct (IT governance mechanisms) and reports their significance. Only two items are significant in the formation of the formative construct: namely, \*CA3 and \*\*FP1:

Relationships	Indicator weights	Indicator weights (Bootstrapped)	T statistics (O/STDEV )	P values
CA1 -> IT Governance	0.115	0.116	1.248	0.213
CA2 -> IT Governance Mechanisms	0.110	0.120	1.123	0.262
CA3 -> IT Governance Mechanisms	0.204	0.193	2.378	0.018
FP1 -> IT Governance Mechanisms	0.293	0.289	2.987	0.003
FP2 -> IT Governance Mechanisms	0.199	0.194	1.894	0.059
FP3 -> IT Governance Mechanisms	0.146	0.146	1.504	0.133
DMS1 -> IT Governance Mechanisms	0.129	0.126	1.382	0.168
DMS2 -> IT Governance Mechanisms	0.074	0.065	0.827	0.409
DMS3 -> IT Governance	-0.026	-0.025	0.358	0.721

CA: Communication approach ,FP: Formal process, DMS: Decision-making structure,CA3: The CIO or similar role in our organisation is able to clearly articulate a vision for IT’s role in the organisation,FP1: Organisation has established formal processes to govern and manage IT projects

*Table 2 Indicator weights of the formative construct (IT governance mechanisms) and their significance*

### 5.3 Support for Hypotheses

This study generated bootstrapping to test the significance of the structural paths based on p-values. For statistical significance, p-values must be less than 0.05. A total of 5,000 subsamples were used along with a 0.05 significance level. A two-tailed, bias-corrected and accelerated (BCa) bootstrap confidence interval method was applied. The analysis showed that all structural relationships were statistically significant.

The presence of two moderating variables was indicated: TM characteristics, and organisational characteristics. To calculate the moderating effects, the product indicator approach was used. This involves using all possible pair combinations of the indicators of the latent predictor and the latent moderator variable.

These product terms serve as indicators of the interaction term in the structural model. The moderation effects tested were not significant. Based on these results, it was observed that hypotheses H1, H2a, H3b, H4b, H5b, H6, H7b, H8b, H9, H10 and H11 were supported (see Table 3), whereas hypotheses H2b, H3a, H4a, H5a, H7a and H8a were not supported.

Hypothesis:	H1	H2a	H3b	H4b	H5b	H6	H7b	H8b	H9	H10	H11
Path Coefficient	0.231	0.134	0.330	0.158	0.150	0.541	0.183	0.226	0.766	0.735	0.710
T Statistics	2.875	2.165	3.768	2.309	2.449	8.613	2.104	2.524	23.168	21.139	17.909
P- Values	0.004	0.031	0.000	0.021	0.015	0.000	0.036	0.012	0.000	0.000	0.000
Significant	**	**	***	**	**	***	*	**	***	***	***

Note: statistically significant \*\*\*P < 0.001, \*\*P < 0.01, \*P < 0.05

Table 3 Structural model relationships

SEM recommendations indicate that the coefficient of determination R2 (0.75) is substantial, moderate (0.50), and weak (0.25) (Sarstedt et al. 2016). This coefficient enables the predictive ability of the structural model to be determined. Table 4 presents the R2 values of all dependent variables in our structural model. It was observed that the model moderately explained the variance in each dependent variable. Figure 1 presents the final structural model without moderation variables. However, in social and behavioural sciences, R2 = 2% is classified with a small effect, R2 = 13% as a median effect, and R2 = 26% as significant effect (Ringle et al. 2015).

Latent Variable	R-Squared (Original)	R-Squared (Bootstrapped)
Business-IT Strategic Alignment	0.757	0.745
Operational Excellence	0.504	0.502
Organisational Performance	0.587	0.585
Quality of IT Project Planning	0.787	0.782
Service Innovation	0.541	0.538

Table 4 Coefficient of determination R-squared

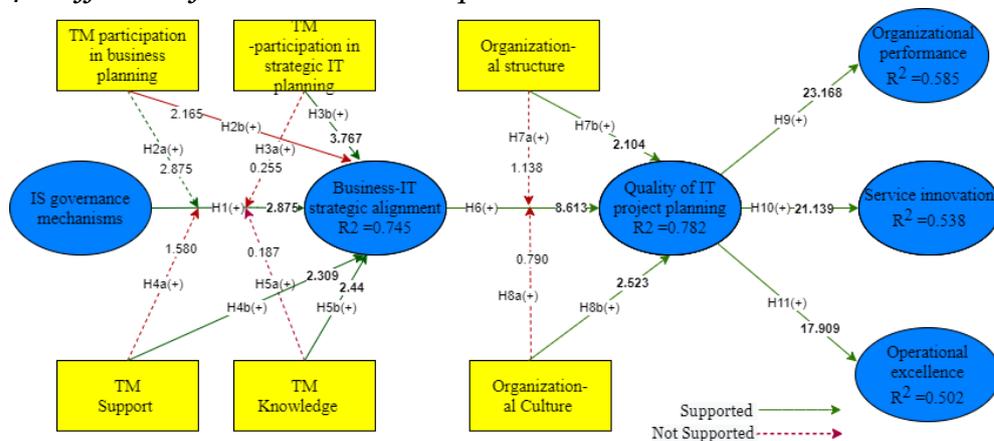


Figure 1 Final structural model with path coefficients and R-squared values (R<sup>2</sup>)

## 6 Discussion and Implications

Regarding research question one on the impact of IT governance mechanisms on Business-IT strategic alignment in the context of IT projects, the empirical results supported hypothesis (H1) regarding IT governance mechanisms. This resulted in vital implications for how public-sector organisations embed governance mechanisms to increase organisational performance, especially operational excellence and services innovation. In particular, it confirms the crucial role that IT governance public-sector organisations can play as a precondition for organisational performance and in the creation of organisational value (Kappelman et al. 2014). As such, managers in these organisations should consider how the IT governance mechanisms can support a more consistent and strategically aligned relationship between IT and business structures when making IT investments and when implementing IT projects (Katzy, Sung and Crowston 2016). This includes the capacity of IT governance mechanisms to respond to changing trends and emerging opportunities in the market in order to achieve IT project goals (Wu et al. 2015).

Research question two focused on Business-IT strategic alignment (weight =0.756), which was more heavily affected by TM support and TM knowledge as well as TM participation in IT strategic planning (0.158, 0.150 and 0.330 weights, respectively). This suggests that when business strategy aligns with IT strategy in terms of encouraging TM support, knowledge, and participation in IT strategic planning, the overall quality of IT project planning is improved. Regarding the moderation of IT governance mechanisms and Business-IT strategic alignment, this relation was only affected by TM participation in IT strategic planning (H3b). Thus, TM high level support, knowledge sharing, and participation in IT strategic planning were found to play a critical role in improving the quality of IT project planning.

This finding has clear implications for how managers can implement IT and technology in public-sector organisations more effectively in the digital transformation age. In particular, it highlights that improving the capabilities of TM around their knowledge of IT and knowledge sharing practices in general can enhance the organisation's ability to deploy IS and support business-IT collaborations (Tallon and Pinsonneault 2011). Research by Dong, Neufeld and Higgins (2009) has shown that good TM knowledge of IT and participation in IT decision making is integral to the effective allocation of key resource (e.g. funding and training provision) and the management IT project protocols. Moreover, good TM knowledge of IT and participation in IT decision making is recognised as fundamental to a robust relationship between e-leadership and strategy alignment. As Li et al. (2016) reported TM knowledge of IT can not only influence employees' attitudes and behaviour around IT, but also their commitment to the execution of IT-related strategies (Li et al. 2016).

In terms of research question three, the results show that both the structure and the culture of the organisation had a direct effect on the quality of IT project whereas H7b and H8b was supported (path coefficient = 0.183 and 0.226 ;  $p = 0.036$  and  $0.012$  respectively). Therefore, the characteristics of the organisations appear to play an important role in increasing the quality of IT project planning and enhancing the performance. This finding can help to guide managers on how to implement IT projects more effectively by reinforcing the importance of understanding how the systems and infrastructures within the organisation play a key role in how effectively the processes and practices are coordinated in the pursuit of organisational goals (Al Shehry et al. 2009 Nene & Pillay 2019). Regarding organisational structure specifically, the findings alert managers to the way that the distribution of power in the context of IT projects can affect the communication channels, rules and protocols in place that influence that behaviours and practices of employees that contribute to Business-IT alignment (Reynolds & Yetton 2015). Moreover, the structural elements of the organisation can influence how IT project teams are selected and coordinated (Reynolds & Yetton 2015). Therefore, the findings in this study can guide managers on the importance of maintaining flexibility within the structure of public-sector organisations to support effective responses to changes during IT project implementation and employee commitment to achieving the IT project goals (Hughes et al. 2020). In terms of organisational culture, the finding reported in this study can guide managers in their application of the observable (e.g. workplace routines and codes of conduct) and non-observable (e.g. organisational values, employees attitudes and assumptions) aspects of the culture to promote IT planning quality and Business-IT strategic alignment (Al Shehry et al. 2009). In particular, by shaping the way that the culture in the organisation influences the motivation and commitment of employees to achieve the stated IT project outcomes (Singh et al. 2019).

Regarding research question four, this study found that organisational performance, service innovation, and operational excellence were improved with robust Business-IT strategic alignment in the context of IT projects (with high weights the standardized path coefficient of 0.766, 0.735 and 0.710, respectively). This finding can be used by managers in public-sector organisations to guide IT project implementation as it reinforces the understanding of the relationship between the quality of IT project planning and multiple organisation outcomes. Managers can draw on the finding to better understand how Business-IT strategic alignment is crucial to the competitiveness of the public-sector and the importance of coordinating the core competencies of the organisation during IT project planning and implementation to create and capture business value (Reynolds & Yetton 2015).

## 6.1 Limitations and Contribution

There are several limitations in the present research. First, the study only involved employees working in public-sector organisations in Saudi Arabia. Different findings may be revealed in different countries under different cultural paradigms. Secondly, the survey was designed in such a way that extensive knowledge of IT project implementation was required to respond to items. For this reason, the justifications given by participants to explain their digital transformation planning objectives might not be due to knowledge of best practices in IT and business strategy alignment. Lastly, only quantitative data were collected in the present research. Other studies have suggested that to study IT and business alignment accurately and effectively, quantitative and qualitative approaches must be used. Wu et al. (2015) stress that future research must employ both quantitative and qualitative data collection methods, or perhaps even mixed-method approaches, in order to obtain a more detailed understanding of strategic alignment issues.

The present study is a valuable contribution to academic and practical research into the topic of Business-IT strategic alignment. It analyses the key causal factors of business and IT alignment for its effect on

organisational performance. This study also focuses on digital transformation and IT and business strategies in public-sector organisations in Saudi Arabia. As such, the study is easy to replicate in other developing countries to improve alignment avoidance models and to develop theories for managers to use to enhance decision-making processes. To be more precise, these theories may help to guide managers to effectively implement IT and technology within their overarching business strategies. What is more, the proposed research model and present research findings support and enhance the RBV and DC theories, as well as improve on existing knowledge of Business-IT strategic alignment.

## 7 Conclusion

Business-IT strategic alignment continues to be a priority focus area for managers of organisations all around the world. This has particular implications for managers in public-sectors organisations in Saudi Arabia particularly in the context of the government's agenda to enhance public-sector service delivery and technology-based operations. Successful outcomes however are dependent on understanding the mediating role that IT governance mechanisms and Top Management knowledge of IT has in achieving Business-IT strategic alignment.

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