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The predictors of the quality of accounting information system: Do big data analytics moderate this conventional linkage?

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ABSTRACT

Although accounting information systems (AIS) of firms are well-established, little is known about their effectiveness and the underlying sources essential to enhance the quality of accounting information system (QAIS). This research aims to identify the readily available resources that can be employed to enhance QAIS of relatively less studied institutions (Islamic social institutions). The theory of dynamic capability view (DCV) is underpinned to conceptualize top management support (TMS), knowledge of system users (KSU), and organizational culture (OC) as the strategic resources to enhance QAIS. Also, the use of big data analytics (UBDA) is imported as a moderator between these variables. To verify the theoretical assumptions of this study, data were drawn from 286 respondents through a personally designed survey and analyzed using the partial least square (PLS) technique. The findings confirmed that TMS and KSU are the significant and positive predictors of QAIS whereas, OC is an insignificant and positive predictor of QAIS. The moderator of UBDA has a significant positive impact on the relationship between TMS/QAIS and KSU/QAIS while an insignificant positive effect on the relationship between OC/QAIS. Our results authenticate TMS, KSU, and OC as reliable tools to enhance the QAIS and import UBDA for maintaining the effectiveness of QAIS. This study contributes to proposing a strategic solution for institutions looking to achieve and maintain a competitive advantage by ensuring effective management of QAIS through dynamic strategic resources.

1. Introduction

Modern-day organizations operating in a highly competitive business environment tend to acquire multiple resources to establish an effective accounting information system (AIS) essential for optimizing financial portfolios and business continuity (Namazi and Rezaei, 2023). This indicates the need to understand the ingredients of an effective AIS so that organizations and employees may warrant their legitimacies (Weber, 2020). Although AIS is well-established in organizations, the debate on its quality is ongoing as the practitioners and academicians are yet to agree on the factors contributing to creating an effective AIS ((Vosselman and De Loo, 2023). It is inferred that the dynamic changes in knowledge inter alia, organizational factors (top management support, competencies of employees, corporate culture), and the sources of information are the potential agents affecting the content and functioning of AIS (Fitriati and Susanto, 2017; Lutfi, 2022; Quattrone and Hopper, 2001; Susanto and Meiryani, 2018).

AIS is a key to organizational success as it allows integrating, coordinating, and controlling business activities (Al-Okaily, 2022; Alshirah et al., 2021; Das, 1989; Papiorek, Hiebl, 2023). It is an integral component of a management information system (MIS) which facilitates the accumulation, classification, analysis, and provision of financial information to external stakeholders, and the management to take strategic action (Al-Dalaien and Dalayeen, 2018). Past studies have developed multiple interpretations of AIS for example Nguyen and Nguyen (2020) rendered it as a set of interconnected activities, formal documents, and technologies operationalized for collecting, processing, and reporting information for third parties. Similarly, Alshira'h et al. (2020) described it as a system established to record events/transactions and generate information for the evaluation of organizational performance by offering inclusive insight into financial transactions (Kaplan et al., 1998; Saad, 2023; Soudani, 2012). Overall, AIS represents information and computer-based technologies and resources established by organizations to track and report accounting activities.

The significance of accounting is linked to its ability to accurately record economic events for stakeholders guiding them to decide and evaluate deliberately about their decisions rendering it an effective information system. Thus, AIS is popular as an information system

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leveraged by organizations for decision-making and probing smart suggestions for its users using financial and noticeable information (Kieso et al., 2010). Generally, organizations and their stakeholders formulate strategic and investment decisions by analyzing financial and non-financial records indicating that the quality of information is essential for legitimizing their decisions. Accounting scholars have widely acknowledged the role of the quality of accounting information system (QAIS) and confirmed that an effective AIS responsibly accumulates, records, and organizes financial and non-financial transactions to foster decision-making (Romney and Steinbart, 2015). An effective AIS contains historical, optional, required, and predictable accounting data often used by business managers to coordinate daily business activities (Chapellier et al., 2013). The QAIS streamlines organizational strategies by making informed decisions and pushing organizations toward gaining better financial control (Chenhall, 2003). It is inferred that an effective AIS enhances strategic decision-making, accounting information quality, better financial control, smooth business transactions, and evaluation of performance. However, effectiveness and quality are not measurable using conventional accounting yardsticks making it difficult to understand how well AIS performs and accomplishes the routine tasks (Whitten and Bentley, 2007). Further, QAIS hinges on multiple elements integrated in a way that all of its components function together for compiling financial data and converting them into meaningful information (Meiryani, 2015).

The multidimensional nature of AIS and the participation of multiple components in the creation of an effective AIS is complex and debatable as little is known about the underlying factors of QAIS. This situation is further intensified by the unprecedented changes in the modern-day business environment requiring firms to design effective adaptation strategies (Al-Okaily, 2021). These dynamic changes have exposed business managers to new challenges that occurred due to voluminous data requiring managers to instigate meaningful insight for strategic decision-making. However, the intricate nature of AIS and the quick development of new events reduces the credibility of information which may raise concerns about the effectiveness of AIS (Frazer, 2020). Past studies have also highlighted the need to consider the non-financial indicators of an effective AIS to support the strategic decisions of firms and different stakeholders (Sievers et al., 2013). Accordingly, the present study endeavors to categorize the relevant factors of an effective AIS and justify whether their operationalization in organizations affects the QAIS.

Following AIS's reputation as a strategic organizational enabler, it is argued that among many other organizational internal factors namely top management support (TMS), AIS users' knowledge, and organizational culture (OC) are likely to improve the QAIS. Previous studies on AIS have predicted the mix findings on this contention and acknowledged these indicators as the viable drivers of enhancing QAIS (Ali et al., 2016; Al-Hiyari et al., 2013; Binh et al., 2022; Fachri et al., 2022; Fitrios, 2016; Iskandar, 2015). Taking together the influence of these indicators on QAIS, and underlying differences in the acquisition of these resources, we infer that QAIS differs among firms and may further be affected due to the limitations in accessing vast and voluminous information often conceptualized as big data analytics (BDA). Thereby, it can cautiously be predicted that despite effective management of these components, BDA is likely to affect the QAIS by moderating this hypothetical linkage. Recently, BDA has established itself as a valuable asset as it empowers firms to enhance financial performance and improve decision-making by interacting with top management commitment, employees' knowledge and skills, and OC (Ali et al., 2021, 2022; Al-Okaily et al., 2023a).

AIS of Islamic financial institutions particularly institutions responsible to manage Islamic social funds (*Zakat*, *Infaq*, and *Sadaqah*) are substantially different in their structure and operation compared to conventional counterparts (Elsiddig Ahmed, 2020; Velayutham, 2014). Recently, Indonesian Zakat institutions have received considerable attention as the effectiveness of these social institutions is criticized due to the lack of a proper AIS system (Lubis, Azizah, 2018). Despite having the largest Muslim population in the region, these social institutions are still underdeveloped in the country slowing down the zakat collection and distribution process (Firdaus et al., 2012; Herianingrum et al., 2023). Further, there is a lack of trust, interest, and confidence in *Zakat* management institutions among the general public highlighting the urgency to establish an effective AIS to tap the potential Islamic social market and realize the actual economic and social benefits. Additionally, *Zakat* managing institutions in the country are attributed to suffering from the lack of TMS and commitment, lack of employee competency, OC mismatch, and lack of innovation in the administration of these Islamic social institutions (Hudaefi et al., 2022). The situation is further intensified by effectiveness and critics of the QAIS of service firms in Indonesia reducing management control, integration, and coordination between departments, and decreasing financial performance (Meiryani et al., 2019; Susanto, 2019). This offers us a vital opportunity to empirically investigate the context of this study and validate whether QAIS can be predicted by TMS, knowledge of system users (KSU), and OC, and confirm the moderating role of BDA in Islamic social institutions.

The rest of the study presents a literature review, theoretical background, and research hypothesis in Section 2 followed by a methodological overview used for data collection and analysis in Section 3. The empirical findings are presented and discussed in Section 4. Finally, Section 5 concludes this study, offers practical and theoretical implications, and makes recommendations for future studies in Section 5.

2. Literature review

2.1. Remodelers of QAIS

AIS is the collection of resources, people, and physical instruments designed for altering financial and non-financial data to generate meaningful insight required for decision-making (Bednar, 2010). The interconnection between activities, documents, and technological resources functions harmoniously for collecting and processing data and generating key data to be used by internal and external stakeholders of the firms (Al-Okaily and Al-Okaily, 2022; Hurt, 2008). The seminal studies on accounting and decision science have emphasized the exigency of adopting AIS to gain better organizational, financial, and communication control (Nicolaou, 2000). The plethora of literature on AIS has conceived different purposes and aspects of an effective AIS. Hla and Teru (2015) conferred that AIS is a computer-aided system established to provide better organizational control. Neogy (2014) recognized AIS as an essential accounting system to support the collection and processing of important data using information technologies for organizational internal use and achieve economic-financial control. Another seminal study by Sajady et al. (2008) classified AIS as a cardinal organizational process initiated to improve the effectiveness of decision-making and grant better control. Some studies admitted that AIS is financial information management tool frequently used for monitoring and managing organizational resources (Rashedi and Dargahi, 2019). The extant literature also suggested strategies to maintain qualitative attributes of AIS by establishing better internal control often a major concern for large firms to ensure compliance with the regulations of the International Standards on Auditing (Campbell et al., 2016; Dimitrijevic et al., 2015; Jarah et al., 2023).

QAIS is an ongoing debate due to its impact on financial performance and dependence on dynamic resources which can be acquired, modified, and evaluated (Kasbar et al., 2023; Monteiro et al., 2022). The evaluation of QAIS and internal control system revealed that AIS with better quality enjoy better decision-making and competitive advantage (Bozzolan, Miihkinen, 2021; Frazer, 2020; Gal and Akisik, 2020; Monteiro et al., 2021a, Moreira Monteiro et al., 2021b). From a decision-making perspective, recent findings of Phornlaphatrachakorn (2019), Monteiro et al. (2021a); b), and Rashedi and Dargahi (2019) confirmed QAIS'

direct and indirect impact on organizational decision-making, financial reporting, and financial information quality.

Over the years accounting scholars have developed various methods to evaluate and measure the QAIS of firms (Rai et al., 2002; Wang and Liao, 2008). The empirical survey of literature revealed a few notable quality assessment constructs however, there is no commonly accepted model to be used as a benchmark to estimate QAIS. The pioneering information success model to assess QAIS was developed by Delone and McLean (1992) by synthesizing six components of an information system whose functioning is dependent on each other. This model has been widely used by past studies to test the quality of information systems. All six components of this construct indicate the quality of both system and information and offer the most relevant indicators to measure the quality of any type of system (Delone and McLean, 2002; Seddon, 1997). While estimating QAIS through this construct, a few studies disseminated the existence of a positive relationship between system quality and information quality leading to better decision-making within the organization (Gorla et al., 2010; Binh et al., 2020). While estimating AIS using the information success model, studies reported poor AIS performance due to the defective system having poor hardware and software (Gorla et al., 2010). The findings further revealed that quality measurement is a multidimensional construct and is the combination of both system and information quality eventually representing QAIS. Following contentions of the information success model, the QAIS of a system determines how well technical elements of a system such as software, hardware, and data perform (Delone and McLean, 1992; Gorla et al., 2010). Whereas, information quality refers to the estimation of the QAIS output usually in the form of online screens or printed report forms (Delone and McLean, 1992).

Previous studies have identified multiple internal and external drivers to enhance the QAIS in different firms. A recent study linked the significance of system and information quality to the effectiveness, usage, and satisfaction of AIS among small-medium enterprises (SMEs) in Yamen (Al-Hattami and Kabra, 2022). The findings of another novel research deduced that information mining from social media may significantly improve the QAIS of firms in the public sector (Duan et al., 2023). Similarly, the research on AIS in the agriculture sector revealed the importance of developing digital software to track cost and productivity data for strategic decision-making (Tingey-Holyoak et al., 2021). A few scholars also recognized TMS and commitment, employees' skill and competency, AIS training organizational culture, and implementation of innovative tools as the potential drivers of the QAIS (Al-Hiyari et al., 2013; Ali et al., 2016; Binh et al., 2022; Fitrios, 2016; Iskandar, 2015). Simultaneously, a few studies indicated management lack of support, lack of operational strategies, organizational structure, and lack of employee knowledge as the barriers to the QAIS and effective functioning of AIS of the firms in different sectors (Alsyouf, Ishak, 2018; Davidson and Heslinga, 2006; Liao et al., 2009; Yanti and Pratiwi, 2022). These findings confirm the need to develop and test a unified theoretical framework that can be adopted by researchers and practitioners to examine the effectiveness and AIS in different sectors. In the context of this study, to the best of our knowledge and a search query in Google and Scopus databases indicated that no empirical study is conducted on the QAIS of Islamic financial and social institutions further warranting the novelty of current research.

To further authenticate the undertaking of this study, it is argued that the emergence of unprecedented events such as the Covid-19 pandemic has further intensified the business environment for firms and simultaneously has created new business avenues by leveraging revolutionary IT-based systems such as AIS (Saad, 2023). This will allow firms to gain better control, integrate, and coordinate business activities which eventually may increase financial portfolios (Al-Okaily, 2021). However, the ongoing debate in the extant literature on the effectiveness of AIS indicates that the occurrence of such events may raise additional concerns about QAIS as Covid-19 demand new resources, skills, and strategies (Al-Okaily et al., 2023b; Huy and Phuc, 2020). Indeed, the role of Islamic social institutions in Indonesia has significantly enhanced amid the Covid-19 pandemic and to uphold their reputation these institutions are required to exhibit effective AIS and employ strategic resources to enhance the QAIS (Wijayanti and Mohamed, 2021).

2.2. Theoretical background and hypotheses

The present study exploited the theory of dynamic capability view (DCV) to understand the factors essential for enhancing the QAIS and verify whether the use of BDA moderates the relationship between these factors and the QAIS of Islamic social institutions. Basically, DCV is derived from the resource-based view theory initially proposed by Barney (1991) to classify the strategic factors/resources for achieving a competitive advantage for firms operating in a dynamic environment (Hitt et al., 2016; Teece et al., 1997). Following the underpinning assertions of DCV, it is predicted that the acquisition of strategic resources such as maximizing top management commitment, enhancing the knowledge of system users, creating organizational culture and environment supportive for AIS, and developing BDA culture to streamline the components involved in enhancing QAIS. Past studies investigating the factors affecting the QAIS have employed a mixture of theoretical and argumentative frameworks i.e., the D&M information success model (Binh et al., 2022; Lutfi et al., 2022), technology readiness model (Al-Hattami and Kabra, 2022), unified theory of acceptance and use of technology (UTAUT) model and TMS model (Lutfi, 2022). The present study aims to explore the underlying components/resources to maximize the QAIS through dynamic resources. Since, quality is dynamic and the factors TMS, KSU, OC, and the use of big data analytics (UBDA) predicted in this research can be classified as the resources that can be acquired and differ based on organizational capabilities.

Previous studies (see, Ali et al., 2020; Akter et al., 2016; Dubey et al., 2019) have vigorously employed DCV logic to determine the strategic resources affecting the dynamic components of organizational competitive advantage confirming the exploitation of DCV is relevant and suitable to investigate the context of this research. Accordingly, we operationalized DCV fundamentals to conceptualize TMS, KSU, OC, and UBDA as a reflective construct and established that the acquisition of these strategic resources is critical to maximizing the QAIS (Barney, 1991). Following the above argument, we operationalized TMS, SUK, OC, and UBDA as high-order construct to investigate their role to optimize the QAIS of Islamic social institutions (Fig. 1).

TMS is essential to successfully implement business strategy and achieve organizational strategic objectives (Chatterjee et al., 2002; Davenport, 1998). TMS is perceived as the extent to which senior management understands the significance of having QAIS and their involvement in developing QAIS (Lin, 2010). A few studies highlighted that TMS covers the level of guidance, authority, and resources provided and maintained during and after the acquisition of a system by the top management (Ifinedo, 2008). Following DCV's views, it is argued that TMS is dynamic and substantially differs as some managers may undermine the significance of QAIS due to the lack of essential knowledge leading to an exhibition of low interest in AIS (Davidson and Heslinga, 2006; Teece et al., 1997). Whereas, constant TMS motivates employees and reduces confusion related to the implementation of different strategies to ensure the effective functioning of AIS resulting in improved QAIS (Lutfi, 2022). Previous studies investigating the impact of TMS on QAIS concluded its positive effect in different firms and predicted it as a critical factor to optimize QAIS in different firms (Al-Hiyari et al., 2013; Fitrios, 2016; Mkonya et al., 2018; Shien, 2015). Taking together the narrative of TMS's positive impact on QAIS and the lack of empirical evidence to validate this claim in the context of the present setting probed us to propose the first hypothesis (H1) as follows;.

H1. : TMS affects the QAIS of Islamic social institutions.

KSU can be perceived as the competence, knowledge, and skill to perform the given tasks (Fitrios, 2016). The pioneering studies on QAIS

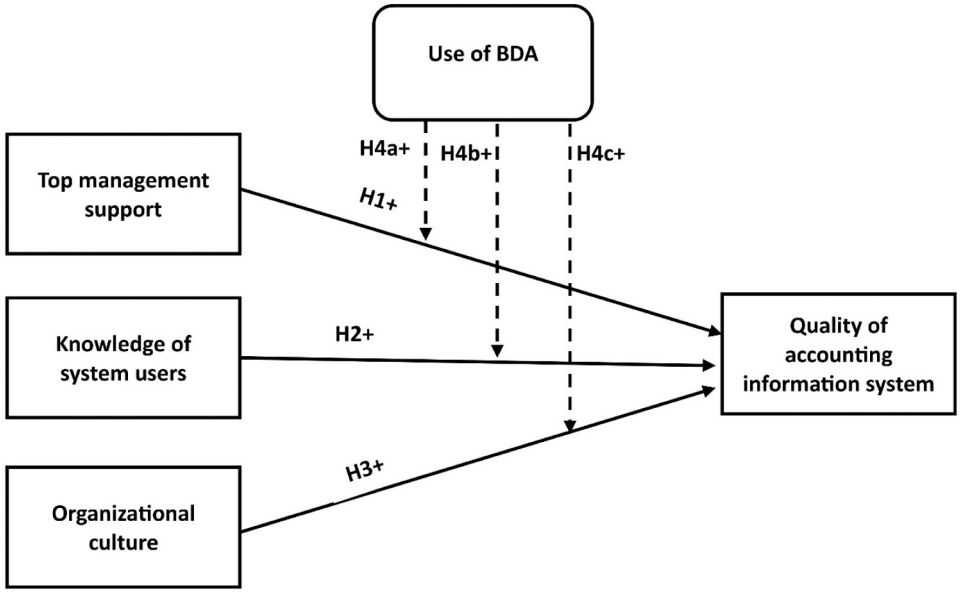

Fig. 1. Theoretical framework.

recognized KSU as the competencies/characteristics of employees to maximize the system performance (Pike et al., 2005). Often these characteristics cover fundamental knowledge of a system, skills to handle the system, aptitudes, personality, and the ability to understand the technical requirements to operate the system (Gibson et al., 2011). Earlier studies highlighting the significance of knowledge and required competencies to handle information technology-based systems reported that knowledge and skills are dynamic due to differences in the extent of exposure to the system, skills, and training to handle a system (Choudhury et al., 2017; Han et al., 2023; Yang et al., 2013) may affect the quality of a system. The findings of recent studies have also emphasized that users understanding of basic concepts of AIS (Vosselman and Loo, 2023), AIS training (Fitrios, 2016), technical competencies (Iskandar, 2015), proper handling of AIS (Yoshikuni et al., 2023) are critical to enhancing the overall QAIS. Further, Islamic social institutions are comparatively new and the competencies of their employees are predominantly debatable as they are often criticized due to a lack of required knowledge and skill to handle innovative systems (Ali et al., 2021). Thus, investigating whether KSU is a predictor of QAIS in Islamic social institutions is appealing for the validation of AIS. This argument leads us to propose a second research hypothesis;.

H2. : KSU affects the QAIS of Islamic social institutions.

Ott (1989) described OC as the underpinning organizational beliefs, values, customs, and practices. Earlier studies defined OC as a system based on conventional norms, shared values, and commonly exhibited and practiced beliefs by the members of organizations (Schein, 1992). The acceptance of these common practices is determined by assessing the implementation level of organizational beliefs by existing and new incoming members to perform daily jobs and resolve problems and conflicts. Generally, organizational members are aware of OC and strive to maintain it to ensure organizational harmony. Whereas, new members have established expectations and often require orientations and training to familiarize themselves with dynamic OC and synchronize their beliefs with existing OC. Nonetheless, OC, structure, routine, command, and control fluctuate therefore it is considered dynamic and may affect organizational performance (Langfield-Smith, 1995). Previous studies characterized it as a major driver to optimize QAIS in different industries and has gained a reputation as a strategic dynamic source and achieve a competitive advantage in organizations (Ali et al., 2016; Kaushal, 2011; Mohammad Mosadegh Rad, 2006; Napitupulu, 2018; Setyaningsih, Nenghiz, 2020). Contextualizing DCV logic, QAIS is a source of competitive advantage for organizations and often requires established, acquired, and strategic sources to maintain this competitive advantage (Teece et al., 1997). To ensure organizational competitiveness, we argue that OC is a dynamic source of competitive advantage affecting QAIS. Islamic social institutions have an established OC which strives to ensure social development by managing innovative and planned systems such as AIS for the administration and management of Islamic social funds. Thus, our third research hypothesis (H3) is proposed as follows;.

H3. : OC affects the QAIS of Islamic social institutions.

UBDA and its capabilities have emerged as a source of competitive advantage for organizations and are recognized as the forefront of innovation (Akter et al., 2016). It has started embedding within organizational systems to perform routine business operations, manage information systems, and enhance organizational performance (Ali et al., 2021). UBDA is inevitable for modern-day organizations considering dynamic sources to ensure the effective and quality functioning of their systems (Gunasekaran et al., 2017). Several past studies have linked UBDA to top management as it is often used by the senior managers of organizations to take informed decisions and achieve objectives (Gunasekaran et al., 2017). Further, it is frequently used by the forms to enhance users' knowledge and skill of certain systems, understand the technical training needs, and customize training programs for the employees (Ferraris et al., 2019). Also, UBDA is employed by firms to identify the right OC for taking strategic decisions pertaining the maximize performance (Dubey et al., 2019). Implying DCV fundamentals, organizations looking to maximize performance by maintaining QAIS and achieve a competitive advantage through established (TMS, KSU, and OC), it is argued that effective management of QAIS through TMS, KSU, and OC may be affected by influential external factors (UBDA). Recently, Islamic financial institutions started using BDA in their systems to debunk the criticism of impeding innovation and absorbing Fintech (Ali et al., 2021). Hence, it is predicted that maintenance of QAIS through TMS, KSU, and OC is moderated by UBDA which is tested by the following research hypotheses;.

H4a. : UBDA moderates the relationship between TMS and QAIS of Islamic social institutions.

H4b. : UBDA moderates the relationship between KSU and QAIS of

Islamic social institutions.

H4c. : UBDA moderates the relationship between OC and QAIS of Islamic social institutions.

3. Materials and methods

To achieve our research objective and test hypotheses, a survey is employed for data collection. The survey development was personally done by the researchers through consultation with 3 academics and 3 AIS practitioners who were familiar with the essential ingredients to enhance the QAIS. We employed language filtration protocols to simplify the language and improve the flow of the questionnaire following experts' feedback which allowed removing complex statements from the survey. The questionnaire was translated into the Indonesian language to ensure that respondents fully understand the purpose and content of each question. The survey was administrated to the employees working in the Baznas (a public entity to oversee Islamic social funds in Indonesia) responsible to manage the funds from Zakat, Infaq, and Sadaqah collected by these institutions located in Western Java province of Indonesia using accounting and information technology systems. This step is crucial to achieving the objectives of the present study thereby, designing a robust and psychometrically accurate survey is recognized as a key component of the sampling strategy.

Although Indonesia has a formally established body (Baznas) to administer the management of Islamic social funds, the economic and social contribution of these funds remains insignificant. A recent study emphasized the need to enhance the governance system of Islamic social institutions in Indonesia to fully harvest the benefits of low-hanging fruits in the form of growth in the gross domestic product (GDP) and poverty reduction (Wahyuni-TD et al., 2021). Ironically, the systems and their quality to enhance the performance of Islamic social funds remain underdeveloped due to various factors resulting in a lack of public trust and confidence in these institutions (Firdaus et al., 2012). Hence, understanding the factors to enhance the quality of key organizational systems (AIS) is an appropriate validation for the undertakings of current research.

3.1. Construct development

The instrument development is done by conducting a detailed literature review for identification of the relevant measures to investigate whether TMS, KSU, and OC affect the QAIS of Islamic social institutions and UBDA moderates the relationship between these variables. The constructs of the theoretical model of this study are operationalized as reflective constructs. The operationalized model of this study is reported in Appendix 1.

The questionnaire was separated into two sections (A and B). Section A exhibits the demographic profiles of the respondents and contains information about their gender, age, educational level, job role, and job experience. Whereas, section B exhibits 22 items to estimate whether QAIS is influenced by TMS, KSU, and OC as well as investigate the moderating effect of UBDA on the relationship between these observable variables. Referring to the arguments propagated in the theoretical model of this study, QAIS of Islamic social institutions can potentially be optimized through dynamic sources such as TMS, KSU, and OC which may alternatively be affected by UBDA. Accordingly, QAIS of Islamic social institutions is measured using 5 items adopted and modified from Hall (2015), TMS is assessed through 4 items modified from Ifinedo (2008) and Lin (2010), KSU is estimated with 4 items adopted from Pike et al. (2005), OC is measured using 4 items adopted from Mohammad Mosadegh Rad (2006), and UBDA is estimated with 5 items taken from Gunesekaran et al. (2017). The survey participants were given a 5-point Likert scale (strongly disagree = 1 to strongly agree = 5) option to respond to these items.

3.2. Data collection procedures

The survey was distributed to the employees of Baznas working as quality, financial, information technology executives, and chief financial officers in 38 branches located in Western Java province. The employees of the sampled Islamic social institutions are considered the appropriate population to study the context of this research as these employees are directly involved in daily organizational operations and their opinions/observations about TMS, KSU, OC, and UBDA may offer an accurate assessment whether these factors contribute to enhancing the QAIS. The survey distribution was done from 15 January 2023–28 February 2023 using social media handlers (LinkedIn, WhatsApp, Facebook, and Instagram) and institutional e-mails. Recently, researchers have started employing virtual data collection techniques due to their efficiency, effectiveness, and reliability confirming the validity of the data collection procedures used in this study (Ali et al., 2021). Altogether, 350 questionnaires were distributed and 292 completed surveys were received indicating a response rate of 83.42%. During the data evaluation process, 6 uncompleted surveys were excluded and the remaining 286 surveys were processed for further data analysis. The method used for data collection and the response rate of the survey highlights the validity of the procedures as we obtained 286 valid cases fulfilling the minimum threshold criteria of 200–400 cases representing 13 respondents to measure each item of the survey (Kline, 2016). The biasness in data collection was checked through a t-test by comparing the response and non-response differences among the survey participants. The results of t-tests confirmed no significant difference as the p-value was > 0.05 (Armstrong and Overton, 1977). Table 1 reports the demographics of the respondents of this study.

3.3. Data analysis techniques

The dearth of studies investigating the factors affecting the QAIS of Islamic social institutions allowed us to categorize the present research as an exploratory study. The Partial Least Square (PLS) technique using structural equation modelling (SEM) is employed due to higher accuracy in estimating the general model compared to other covariance-based techniques (Henseler et al., 2014). Additionally, SEM minimizes the

Table 1
Demographic profiles of respondents.

Demographic character	N	Percentage
Gender		
Male	126	44.05
Female	154	53.84
Others	4	1.39
Age (years)		
Below 25	32	11.18
Between 26 and 30	63	22.02
Between 31 and 35	77	41.39
Between 36 and 40	46	16.08
Between 41 and 45	40	13.98
Above 45	28	9.79
Education level		
Diploma/certificate	13	4.54
Bachelor	176	61.53
Master	80	27.97
PHD	17	5.94
Job role		
Quality control executive	66	23.07
Financial executive	101	35.31
Information technology executive	92	32.16
Chief financial manager	27	9.44
Job experience (years)		
Below 5	78	27.27
Between 5 and 10	92	32.16
Between 11 and 15	64	22.37
Between 16 and 20	45	15.73
Above 20	7	2.44

misspecification errors in the model. WarPLS 7.0 version is used for the estimation of the theoretical model and testing of the research hypotheses. The PLS technique often known as the prediction-oriented method facilitates researchers in estimating the probability of exogenous variables (Peng and Lai, 2012). The present study expects to measure the predictability or explanatory power of antecedent factors (TMS, KSU, OC, and BDA). The literature substantially lacks empirical evidence about the impact of these dynamic variables on the QAIS of Islamic social institutions therefore, the proposed theoretical linkage is missing which further validates our claims to employ the PLS-based modelling technique for data analysis (Henseler et al., 2014). Also, the theoretical linkage proposed in this study is relatively complex and should be analyzed using highly accurate techniques further affirming the use of the PLS technique. To estimate our model, we followed Peng and Lai (2012), Henseler et al. (2014), and Moshtari (2016) procedures using a two-stage process. The first phase evaluates the validity and reliability of the measurement model followed by the structural model's estimation in the second phase.

4. Results

4.1. Model estimation

The validity and reliability of the measurement model were estimated in the first phase of analysis to verify whether the measurement model's quality is acceptable. The quality of our model was checked through scale composite reliability (SCR), Cronbach's alpha coefficients, and average variance extracted (AVE) tests. Table 2 presents the results of the measurement model's quality. Notably, SCR and Cronbach's alpha coefficients are higher (>) than the minimum threshold of 0.70 while, AVE values for OC were 0.41. This confirms the reliability of the measurement model as the latent constructs explain at least 41% variance in the items. The items with weak factor loadings (<0.5) were removed and new results were obtained after reperforming SEM analysis. We noticed considerable changes in factor loadings, SCR, and AVE values (Table 3) and found that the quality of the measurement model is satisfactory as the newly obtained values of all the items were > 0.50 (Hair et al., 2017). Subsequently, the correlation among all the constructs of this study was also estimated to ensure that the discriminant validity of our measurement model is acceptable. The results of the correlation test (Table 4) indicate that the leading diagonal entries representing square roots of AVE were > the inter-construct correlations establishing that the items used in the measurement model are the indicators of the unique construct.

Table 2
Initial factor loadings of the indicator variables (composite reliability) (AVE).

Variables	Measurements	Factor loadings	Variance	Error	SCR	AVE
QAIS	QAIS1	0.77	0.55	0.54		
	QAIS2	0.36	0.09	0.91		
	QAIS3	0.42	0.10	0.90	0.86	0.61
	QAIS4	0.72	0.60	0.38		
	QAIS5	0.74	0.59	0.36		
TMS	TMS1	0.66	0.55	0.44		
	TMS2	0.58	0.60	0.42	0.82	0.77
	TMS3	0.63	0.61	0.37		
	TMS4	0.35	0.63	0.65		
KSU	KSU1	0.77	0.52	0.33		
	KSU2	0.28	0.68	0.60	0.88	0.81
	KSU3	0.82	0.62	0.27		
	KSU4	0.88	0.71	0.11		
OC	OC1	0.18	0.74	0.82		
	OC2	0.69	0.70	0.30	0.74	0.41
	OC3	0.57	0.61	0.42		
	OC4	0.66	0.55	0.34		
UBDA	UBDA1	0.62	0.58	0.48		
	UBDA2	0.67	0.53	0.37	0.89	0.77
	UBDA3	0.73	0.60	0.26		
	UBDA4	0.78	0.64	0.28		
	UBDA5	0.66	0.61	0.34		

Table 3
Factor loadings of the indicator variables (composite reliability) (AVE).

Variables	Measurements	Factor loadings	Variance	Error	SCR	AVE
QAIS	QAIS1	0.77	0.55	0.54		
	QAIS4	0.72	0.60	0.38	0.88	0.63
	QAIS5	0.74	0.59	0.36		
TMS	TMS1	0.66	0.55	0.44		
	TMS2	0.58	0.60	0.42	0.84	0.81
	TMS3	0.63	0.61	0.37		
KSU	KSU1	0.77	0.52	0.33		
	KSU3	0.82	0.62	0.27	0.89	0.84
	KSU4	0.88	0.71	0.11		
OC	OC2	0.69	0.70	0.30		
	OC3	0.57	0.61	0.42	0.78	0.51
	OC4	0.66	0.55	0.34		
UBDA	UBDA1	0.62	0.58	0.48		
	UBDA2	0.67	0.53	0.37	0.93	0.81
	UBDA3	0.73	0.60	0.26		
	UBDA4	0.78	0.64	0.28		
	UBDA5	0.66	0.61	0.34		

Table 4
Correlation matrix.

Constructs	QAIS	TMS	KSU	OC	UBDA
QAIS	0.69				
TMS	0.10	0.86			
KSU	0.22	0.26	0.87		
OC	0.13	0.17	0.14	0.63	
UBDA	0.33	0.27	0.25	0.31	0.84

4.2. Common method bias (CMB)

It is contemporary for the researchers to address CMB issues in survey-based research through a number of informants for each observable item (Kock, 2015). CMB generally arises due to various factors such as consistency motif and social desirability. To resolve CMB issues in our self-reported data, we follow Kock's (2015) procedures and ensure that they do not contaminate the final results of this study. Accordingly, the survey participants were requested to respond to the questionnaire following the formal policies established by Islamic social institutions to enhance the QAIS instead of using personal observations. Further, a statistical test (Herman's single-factor) was conducted for estimating CMB and analyzing whether CMB was likely to affect our final results. The results in Table 5 disseminate the covariance explained for the single factor was 33.65% verifying that the results of this study were unlikely to be affected by CMB.

4.3. Endogeneity checks

Before continuing to the final phase of analysis (hypotheses testing), it is crucial to confirm the endogeneity of exogenous variables used in our theoretical model. Importing arguments presented during the development of the theoretical model of this research, TMS, KSU, OC, and UBDA were conceptualized as exogenous variables to QAIS instead of the other way around leading to imply that endogeneity is less likely to intervene in this study. Additionally, to support our argument, we performed the Durbin-Wu-Hausman test following Davidson, MacKinnonm (1993) method. We performed a regression analysis by controlling the size of Islamic social institutions (SISI) and regressed TMS, KSU, OC, and UBDA with QAIS, and the obtained regression residuals were used for testing hypothetical equations. We observed that the coefficients of regression residuals were insignificant inferring that TMS, KSU, OC, and UBDA were not endogenous in our theoretical model

Table 5
Single factor Harman's test.

Components	Initial eigenvalues			Extraction Sums of squared loadings		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	11.661	33.652	33.652	11.661	11.661	33.652
2	3.546	3.561	67.684			
3	3.470	3.511	70.559			
4	3.481	3.492	65.642			
5	3.494	3.523	68.628			
6	2.567	2.583	55.548			
7	2.570	2.590	58.516			
8	2.568	2.581	60.498			
9	2.555	2.590	63.483			
10	1.762	1.806	61.489			
11	1.679	1.704	52.666			
12	1.685	1.688	54.703			
13	1.642	1.658	58.721			
14	1.668	1.673	47.733			
15	1.339	1.448	42.748			
16	1.449	1.554	48.776			
17	1.335	1.402	41.789			
18	1.330	1.395	38.792			
19	0.783	1.823	78.348			
20	0.802	0.836	81.365			
21	0.823	0.865	86.406			
22	0.849	0.866	91.361			

Extraction method: principal component analysis.

validating the underpinning conceptualization of this research.

4.4. hypotheses testing

The research hypotheses are tested through the PLS-based bootstrapping technique which measures standard errors and the significance of parameter estimates (Peng and Lai, 2012; Moshtari, 2016). We preferred bootstrapping technique over traditional parametric techniques as they are unable to detect the normal distribution of multivariate (Henseler et al., 2014). The PLS output was obtained using WarPLS 7.0 and the results of these estimates are embedded in Figure 2. It is observed that R^2 values for TMS (0.735), KSU (0.789), and OC (0.655) were significant confirming a considerable variance in QAIS. The PLS output was carefully examined and the values of standardized β and ρ are used for hypotheses testing. The results determine that H1 (TMS → QAIS) is supported (β = 0.532; ρ = < 0.001). The findings of H2 (KSU → QAIS) also supports (β = 0.603; ρ = < 0.001) our assumptions in H2. However, it is found that H3 (OC → QAIS) was not supported (β = 0.022; ρ = > 0.001).

We used 500 bootstrapping to obtain PLS path coefficients for examining standardized β and their ρ-values. The results of structural estimates are reported in Table 6.

To further unpack the explanatory power of the theoretical model, we estimated the explained variance (R^2) of endogenous variables. One

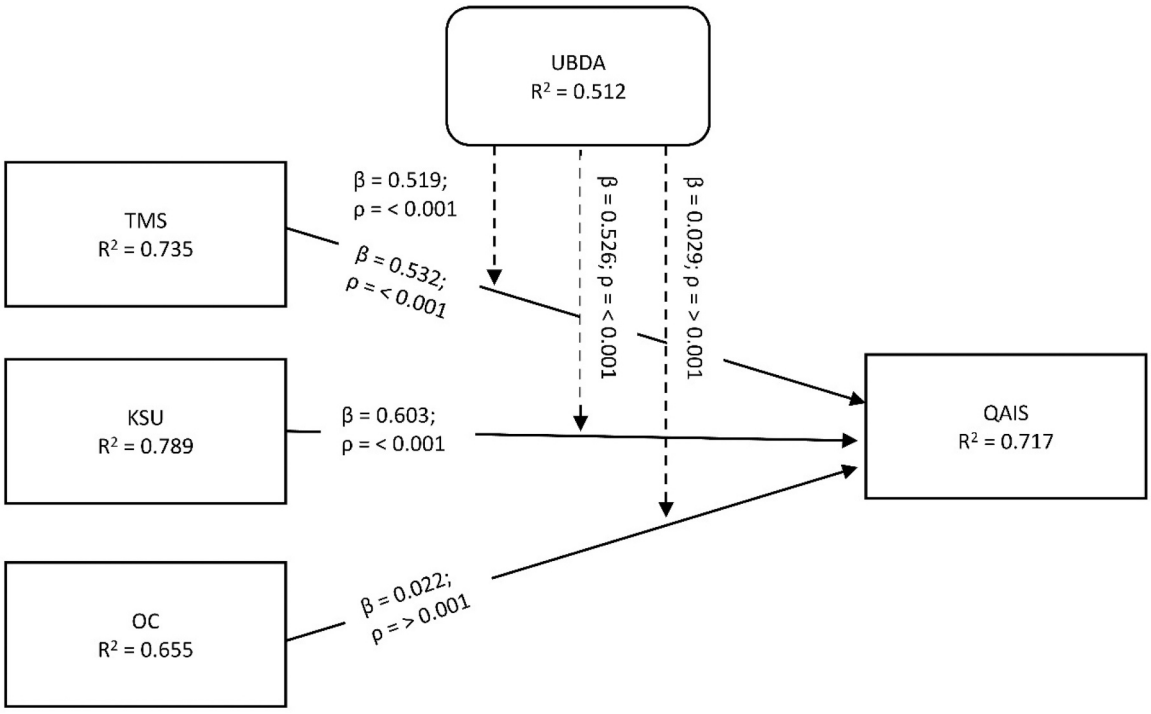

Fig. 2. PLS estimates.

Table 6
PLS path coefficients.

Hypothesis	Impact of	On	β	ρ	Supported/not supported
H1	TMS	QAIS	0.532	< 0.001	Yes
H2	KSU	QAIS	0.603	< 0.001	Yes
H3	OC	QAIS	0.022	> 0.001	No

of the factors PLS is preferred for the estimation of the structural model by the researchers is its unique ability to maximize endogenous variables' variance explained. (Chin, 1988). The values of R^2 for TMS (0.735), KSU (0.789), OC (0.655), and UBDA (0.0.512) are moderately strong. The actual effect size of endogenous variables on latent variables remains unknown which can be estimated through Cohen's (1988) technique (f^2). Hence, estimation of effect size is done following the f^2 technique of large (0.35), medium (0.15), and small (0.02) values as a threshold to examine the effect of TMS, KSU, OC, and UBDA on QAIS. The results of f^2 for TMS (0.756), KSU (0.814), OC (0.661), and UBDA (0.530) are considerably large. Next, the predictability of the structural model is estimated by Stone-Geisser's Q^2 technique and we noticed that endogenous variables have an acceptable predictive relevance as Q^2 values are greater than zero (Peng and Lai, 2012; Moshtari, 2016). Table 7 reports the findings of R^2, f^2, and Q^2.

The moderating effect of UBDA on the relationship between the constructs of this study is investigated by calculating the standardized estimates (SE) and Chi-square difference. The results of UBDA's moderating effect are summarized in Table 8. It is notable that SE and Chi-square values are significant and positive for the paths between TMS → QAIS (H4a) and KSU → QAIS (H4b) and positive and insignificant between OC → QAIS (H4c) path confirming that UBDA's moderation effect hypotheses are partially supported. Moreover, the values of SE and Chi-square difference are higher for the path between KSU → QAIS as compared to the paths between other variables.

5. Discussion and conclusion

The present study has examined the methods to improve QAIS of Islamic social institutions through strategic resources of TMS, KSU, OC, and with a moderator of UBDA. Previous studies (see Ali et al., 2016; Alsyouf, Ishak, 2018; Davidson and Heslinga, 2006; Liao et al., 2009; Lutfi, 2022; Yanti and Pratiwi, 2022) have operationalized TMS, KSU, and OC as the formative concept to improve QAIS in different industries. However, our research has deployed these strategic sources together with UBDA as dynamic reflective latent constructs to enhance the effectiveness and management of QAIS of Islamic social institutions.

Our empirical findings suggest a significant and positive relationship between TMS/QAIS, KSU/QAIS (H1 and H2), and an insignificant positive relationship between OC/QAIS. The results of the moderator of UBDA represent a significant positive impact on the relationship between TMS/QAIS and KSU/QAIS (H4a and H4b) and an insignificant positive impact on the relationship between OC/QAIS (H4c). Overall, these findings authenticate that strategic implementation of organizational resources (TMS, KSU, and OC) as a tool to manage the sources of competitive advantage (QAIS) (Hall, 2016; Teece et al., 1997; Vosselman and Loo, 2023). The operationalization of UBDA as a moderator is also justified as it allows firms to maintain sources of competitive advantage through contingent innovative and analytical sources (Duan et al., 2023; Nicolaou, 2000). Nonetheless, the empirical findings of this study advance that maintaining the source of competitive advantage is inevitable for business continuity and achieving economies of scale therefore firms should remain surging strategies to optimize business performance by improving the quality of key systems.

Table 7
Summary of structural estimates.

Constructs	R^2	f^2	Q^2
TMS	0.735	0.756	0.765
KSU	0.789	0.814	0.820
OC	0.655	0.661	0.672
UBDA	0.512	0.530	0.543

Table 8
Multi-group test results (moderating effect of UBDA).

Hypotheses	Relationship	UBDA SE[a]	Chi-Square Difference p
H4a	TMS → QAIS	0.519	***
H4b	KSU → QAIS	0.526	***
H4c	OC → QAIS	0.029	**

*** Significance level $p < 0.001$
** Significance level $p < 0.05$
[a] Standardized Estimate (SE)

Our empirical results of PLS path coefficients (Table 6), summary of structural estimates (Table 7), and the multi-group analysis (Table 8) determined that TMS has a significant positive impact on QAIS and UBDA as a moderator has a significant positive impact on the relationship between TMS/QAIS inferring that TMS may positively improve QAIS of organizations. This result is consistent with the findings of Ali-Hiyari et al. (2013), Fitrios (2016), Mkonya et al. (2018), and Shien (2015) corroborating that successful implementation of business strategy is impossible without the guidance and support of senior management. However, it is crucial for the top management to fully understand the significance of QAIS and their proactive involvement in achieving organizational objectives (Lin, 2010). In this regard, senior managers may employ UBDA so that key resources are acquired and maintained for the effective functioning of organizational systems (Akter et al., 2016).

The findings of H2 and H4b indicate that KSU has a significant positive impact on QAIS and UBDA has a significant positive effect on the relationship between KSU/QAIS. This result validates the findings of Pike et al. (2005) Gibson et al. (2011), and Vosselman and Loo (2023) emphasizing the need of developing the knowledge and skills of employees for the maximization of system performance. A careful overview of the summary of structural estimates (Table 7) and multi-group analysis (Table 8) represents that KSU effect size and moderating effect are highest as compared to other indicators in our structural model. This warrants the exigency of upgrading the required accounting and information technology competencies of the employees so that QAIS remains unaffected by these humanistic factors. Further, both employees and their employers may leverage BDA to assess existing accounting and information technology competencies and identify the future training needs of the employees (Choudhury et al., 2017; Lutfi et al., 2022). Indeed, this finding has practical implications for Islamic financial/social institutions' employers who continue suffering from the issues of underdeveloped sectors despite their presence in potential global markets (Ali et al., 2021).

Contrary to our assumption, the results of H3 and H4c indicate that OC has an insignificant positive impact on QAIS, and UBDA's moderation effect is also insignificant and positive on the relationship between OC/QAIS. This result diverges from the studies of Kaushal (2011), Mohammad Mosadegh Rad (2006), and Napitupulu (2018) leading us to predict that the role of OC in QAIS is debatable as every organization is unique and has its own characteristics which sometimes may not align with certain systems. This argument is validated by contextualizing Dubey et al., 2019 study claimed that different organizational cultures namely flexible and controlled organizational structures differently influence strategic decision making hence it must be operationalized following organizational objectives.

The current study has empirically analyzed the factors to enhance the QAIS of Islamic social institutions under the moderating influence of UBDA. First, we justified that TMS, KSU, and OC are the pertinent drivers to optimize QAIS. Second, we developed a theoretical model

using TMS, KSU, and OC as strategic resources to enhance QAIS. Additionally, UBDA was imported as an external factor (moderator) influencing the relationship between predictors and outcome variables. The statistical analysis confirmed that TMS and KSU have a significant positive and OC has an insignificant positive impact on QAIS. UBDA as the moderator between predictors and outcome variables appears to have a significant positive impact on the relationship between TMS/QAIS and KSU/QAIS and an insignificant positive influence on the nexus between OC/QAIS.

5.1. Research contribution

Our empirical results have three unique contributions to the literature on AIS and decision science. The theoretical context of this study is novel as it suggests methods to optimize QAIS of Islamic social institutions contributing to the knowledge of AIS by offering new statistical and fact base evidence to improve the effectiveness of AIS. Considering the practical domain, the insight of this study offers several points to be considered for enhancing the business performance of Islamic financial institutions and reviving the crumbling Islamic social sector by optimizing QAIS through strategic and dynamic sources of TMS, KSU, OC, and UBDA. The results of the current study also contribute to laying the foundation for future studies by benchmarking our theoretical assertions and suggesting performance, effectiveness, and quality enhancement strategies which will motivate firms to exploit more strategic options to improve their financial portfolios.

5.2. Implications for practice

This research has multiple implications for practice. The regulators of Islamic social institutions primarily suffering from governance and legitimacy issues may use the insight of this study to establish formal regulations and guidelines for AIS, especially for the factors of TMS, KSU, and OC which will optimize QAIS, resolve governance issues, and restore public trust. The results of this study outline that the predictors of TMS, KSU, and OC have a positive effect on QAIS which can be considered by policymakers to suggest relevant strategies conditioning senior management, and employees and directing organizational objectives to maintain certain physical resources, have formal knowledge, and exhibit culture supportive to enhance QAIS and improve the economic and social effectiveness of these institutions. The business managers of Islamic social institutions may find our findings useful to enhance the QAIS of their entities which will allow them to achieve a competitive advantage while operating in a complex business environment. The consultants may consider the results of this study to suggest business optimization strategies for Islamic social institutions and propose incorporating innovative solutions (UBDA) to take informed and factual decisions for achieving economies of scale.

5.3. Limitations and future research

Similar to any other empirical study, this study also contains several limitations that mainly arise due to the theoretical model, research instrument, data collection, and analysis procedures. The theoretical model of this study was designed using organizational internal factors namely TMS, KSU, and OC. Although the theoretical model's validity and reliability are justified through several statistical procedures, there is a risk of misrepresentation of QAIS as quality is a dynamic and situational-based terminology that may be perceived differently by the stakeholders (customers) of organizations. Future studies are recommended to incorporate the influence of external variables especially the perception of customers about QAIS so that their trust in these entities can be restored. We used a triangulation technique to design the surrey instrument to ensure efficiency in data collection from the sampled population which may exhibit issues of Common Method Variance (CMV) and the Halo effect resulting in a lack of generalizing the findings. Most of these issues are resolved by conducting statistical tests (Harman single-factor analysis and the Durbin-Wu-Hausman test). Another major limitation of this study was the data collection procedures through convenience sampling representing the lack of diversity in the response of participants. This was reduced by the random circulation of research instruments through social media handlers to ensure randomness and opinions of participants about QAIS with different backgrounds.

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Conflict of Interest

The authors declare no potential conflict of interest.

Ethical Statement/Approval

Not applicable.

Appendix 1. Operationalized construct

Constructs	Construct label	Measures	Source
Quality of accounting information system	QAIS	QAIS1) QAIS of our institution is accurate and up to the mark.QAIS2) QAIS of our institution is reliable.QAIS3) QAIS of our institution is relevant and up to date.QAIS4) QAIS of our institution is inclusive.QAIS5) QAIS of our institution is useful for the stakeholders	(Hall, 2015)
Top management support	TMS	TMS1) Top management of our institution understands the significance of QAIS.TMS2) Top management of our institution is serious about QAIS.TMS3) Top management of our institution develops strategies to enhance QAISTMS4) Top management of our institution allocates resources to enhance QAIS.	(Ifinedo, 2008; Lin, 2010)
Knowledge of system users	KSU	KSU1) The employees of our institution have preliminary knowledge about QAIS.KSU2) The knowledge of the employees of our institutions is relevant to QAIS.KSU3) The level of technical skill of the employees is appropriate to handle QAIS.KSU4) The employees of our institution have QAIS training.	(Pike et al., 2005)
Organizational culture	OC	OC1) Our institution has established policies to enhance QAIS.OC2) Our institution focuses on enhancing QAIS through innovative ideas.OC3) The employees of our institutions are always motivated to enhance QAIS.OC4) The employees of our institution are encouraged and empowered to develop strategies to enhance QAIS.	(Mohammad Mosadegh Rad, 2006)
Use of BDA	UBDA	UBDA1) Our institution only trusts UBDA to achieve QAIS goals.UBDA2) Our institution prefers UBDA while developing QAIS policies. UBDA3) The top management of our institution considers UBDA to formulate QAIS strategies. UBDA4) The employees of our institution rely on UBDA to	(Gunasekaran et al., 2017)

(*continued on next page*)

(*continued*)

Constructs	Construct label	Measures	Source
		understand the knowledge of QAIS. UBDA5) Our institutional culture is suitable for UBDA and enhances QAIS.	

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