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The Nexus of Quality Management and Construction Organisations' Performance in Urban Ghana: The Moderating Effect of Information Technology Integration

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Abstract:- Effective quality management strategies improve and sustain organisations' competitiveness in the current business environment by incorporating information technology. The primary aim of this research is to investigate the moderating influence of information technology on the connection between quality management strategies and the performance of construction firms in Accra, Ghana. The study utilized a sample of 255 construction firms in the Accra-Metropolis. The data collected underwent analysis using inferential and descriptive statistics. The results indicated a favorable impact of quality management strategies on the performance of construction companies. Furthermore, a positive correlation was found between the integration of information technology (IT) and the performance of construction firms. Nevertheless, there was an insignificant correlation of the moderator (information technology integration) on the link between quality management strategies and the performance of construction companies. This could be attributed to the absence of skills and expertise, as well as the absence of a modernized information technology system that integrates communication and quality management processes in construction organizations in Ghana. Subsequent studies should concentrate on the barriers to integrating IT into quality management processes in construction firms in developing nations.

Keywords:- *Quality Management, Performance of Construction Companies, Information Technology Integration.*

I. INTRODUCTION

Quality control has been an area of interest in recent years, as it is a driving force for organizational growth and development (Odero and Ayub, 2017; Liu et al., 2019; Patrucco et al., 2019; Raj et al., 2020). The implementation of quality control practices is crucial for customer retention and the survival of any establishment. Companies across the globe have attempted to reform their policies to enhance value for money and meet customer needs (Osei Mensah et al., 2012), but achieving quality outcomes remains challenging (Basheka, 2017; Jong et al., 2019).

Efficiency and effectiveness are important measures of quality performance. Effective quality management occurs when previously defined goals regarding service delivery are met (Beshah and Kitaw, 2014). Effective quality management connects planned resources with achieved goals. Achieving efficiency in service delivery requires joint effort from organizations as well as its clientele. Previous studies have suggested that efficient quality management systems are linked to delivering high-quality services (Masudin and Kamara, 2018; Praveen andKhaliq, 2018). Anane and Kwarteng (2019) suggest that effective quality management is attained when predetermined goals and objectives regarding service delivery within an organization are met, which connects actual and planned performance for decision-making purposes. Previous research has also emphasized that delivering quality services is correlated with efficient quality management practices (Jong et al., 2019; Fundin et al, 2017).

Furthermore, Wu et al (2015) contend that implementing efficient quality management practices plays a critical role in enhancing service quality. Without acceptable standards of quality, obstacles arise which can lead to a decline in company performance. As such, companies are increasingly recognizing the importance of effectively managing their quality processes (Basheka, 2017; Fundin et al., 2017; Jong et al., 2019). The development of appropriate quality management practices is essential to a company's competitiveness and sustainability (Bailey, 2011).

Previously, researchers focused on optimizing firms' productivity by concentrating more on processes and equipment from a scientific standpoint using productivity optimization models with little emphasis on quality management (Daniels et al., 2018; Wu et al., 2015). This study asserts that innovation in quality control strategy drives companies' sustainability efforts - an achievement that can only be accomplished through implementing efficient quality management practices. The current state of

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business globalization has prompted companies to seek optimal strategies for developing and managing quality control processes that not only meet but exceed established productivity and performance standards (Brown and Hyer, 2010; Karanja and Kiarie, 2015). Research in this area indicates that quality management strategies are intangible assets that drive the creation of value within firms (Cha et al, 2014; Makabira andWaiganjo, 2014). Moreover, studies have shown that over 80 percent of value creation is driven by management strategies rather than physical assets owned by a firm (Nieves and Quintana, 2018). Mchopa et al. (2014) found a direct relationship between quality management practices and organizational performance with positive effects on business survival. Consequently, managers must adopt and implement the best quality management practices to avoid losing profits while ensuring cost-effectiveness. Conversely, poor-quality control practices lead to increased costs for organizations as delays in project implementation can escalate expenses with occasional poor execution outcomes (Beshah and Kitaw, 2014).

Organizational performance refers to the amount or percentage of work done measured against set standards for productivity and quality over time (Upadhaya et al., 2014). Measuring organizational performance enables companies to assess reasons for their performance levels or evaluate production/service delivery costs for budgetary purposes (Chartterjee et al., 2022). Over the years, employee behavioural models and many other forms of models have been used to explain organisational performance (Daniels et al., 2018), without looking at how quality management practices affect performance. Having recognised the relevance of quality management on organisational performance, it is vital to emphasize that various approaches to quality management result in varied levels of performance.

Digitalisation involves transforming companies using big data technology aimed at supporting profitability while creating competitive advantage across all levels, which represents the fourth era of industrial revolution spearheaded by digitalization (Calderon-Monge et al., 2023). In this age where digital application technologies dominate businesses integration approach becomes essential (Calderon-Monge et al., 2023), replacing manual quality control (QC) activities with modern era information technology (IT) focusing on industry optimization (Dery et.al., 2017) and reducing future costs significantly through resource optimization (Calderon-Monge et al., 2023). From this perspective, the study argues that, IT could play a significant role in streamlining quality control processes which would result in improved organisational performance.

Studies conducted previously have generally expressed dissatisfaction about the inadequacy of quality management plans, the lack of staff development policies, non-adherence to quality assurance policies, poor working conditions of staff, and the resulting decreased performance of companies (see for example Tukuta and Saruchera, 2015; Wambui, 2013), and the generic effect of quality management practices on organisational performance (see also Fundin et al., 2017; Ashokkumar, 2017; Masudin and Kamara, 2018; Jong et al, 2019). Consequently, there exists plenteous literature on how generic quality management practices affect organisational performance (see for example; Beshah and Kitaw, 2014; Ashokkumar, 2014; Masudin and Kamara, 2018; Wu et al, 2015) but few have focused on the moderating role played by Information Technology integration in measuring the relationship between quality management and the performance of companies in the construction industry hence creating a gap in literature which this study intends to fill. This study hypothesizes that IT integration could shape quality management to improve performance in construction organisations. Consequently, this study aimed at adding more empirical findings by determining the moderating role of IT integration on the relationship between quality practices and performance of construction organizations in Ghana, however focusing on the Greater Accra Region, which boasts of a vibrant construction market compared to other Regions.

II. LITERATURE REVIEW

A. Concept of Quality Management

Numerous scholars have presented various perspectives on the concept of quality management. According to Dery et al. (2017), quality management involves the strategic coordination of human resources, assets, and financial resources to effectively meet predetermined organizational benchmarks. Beshah and Kitaw (2014) define quality management as the systematic approach to delivering optimal quality at the right place and time to uphold a desired level of production at minimal costs. The primary objective of quality management is to regulate the allocation of resources to meet specified production standards. Karanja and Kiarie (2015) further argue that the framework of quality management should facilitate the strategic planning and harmonization of all resource types to optimize resource utilization, thereby reducing expenses while fulfilling project and client requirements. Moreover, Makabira and Waiganjo (2014) advocate for the integration of quality management systems in organizations to ensure that quality control processes are meticulously planned and effectively implemented. A robust quality control mechanism is essential to guarantee the appropriate quantity and quality of materials is utilized for service delivery, precisely when required. Bailey (2011) characterizes quality management as the systematic utilization of necessary resources to accomplish organizational goals. This process typically commences with the establishment of standardized quality control procedures and their enforcement throughout project execution, monitoring, and assessment. Quality management functions encompass collaboration with designers, procurement, receiving, warehousing, quality assurance, and inventory management (Sarkar, 2021).

From the definitions foregoing, quality management is basically concerned with the planning, organising, directing and controlling of resources against a set of predetermined quality control measures that assist organisations in achieving the right levels of quality in service delivery

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processes. Bagshaw and Peters (2015) argue that, the essence of quality management is to make organisations efficient in their service delivery quest while significantly improving customer satisfaction. The function of the quality manager in a firm is to ensure that service delivery is efficiently carried out and at optimum costs. Thus, service delivery cost should not be more than income but in the same way the standards set for service delivery and client satisfaction must be met. According to Bagshaw and Peters (2015) and Bailey (2011), the various functions of quality management system include; planning for service delivery processes, establishment and implementation of quality control in service delivery, cost control, inventory management, and monitoring and evaluation of service delivery processes. Quality management in any establishment therefore forms a substantial cost element which organisations must effectively manage.

The successful delivery of services requires the establishment of measures that ensure that resources are efficiently utilised and handled throughout service delivery phases. For this reason, it is essential that service managers take cognisance of planned quality control standards and the actual effectiveness achieved after service delivery. According to Wambui (2017), service managers must recognise the potential service delivery weaknesses which could reduce service quality and as such put in place measures to reduce the occurrence of such weaknesses. Occasionally a weak system of planning and quality control processes characterised by low standard inventory, inappropriate distribution of resources and poor performance monitoring often result in low productivity and reduces service quality that ultimately lead to high cost of service delivery (Besha and Kitaw, 2014). Efficient quality management therefore plays a major role in reducing service delivery costs and eventually contributing to the attainment of organisational objectives.

Clients play important role in organization's quest to deliver quality services (Basheka, 2017). Many companies rely greatly on clients for the quality needed for production and service delivery. Good relations with clients might be decisive for a company to be sustainable. Companies that have good relationship with clients could be more successful in their service delivery efforts than companies that have bad relationship with clients (Makabira and Waiganjo, 2014). When a company has good relations with its clients, it could benefit from feedback, which could help in improving service delivery in the future. Based on the studies presented by researchers, it is clear that effective quality management can minimize cost and improve the satisfaction of clients. Effective quality of management could also improve the trademark and goodwill of organisations which could translate into income growth, improved shareholder wealth and dividends, and customer loyalty (see also Osei Mensah et al., 2012; Fundin et al. 2019).

B. Quality Management Practices

Quality management practices are essential in the attainment of organizational goals and objectives. Basheka (2017) suggest that organizations failing to effectively implement quality management practices in service delivery may encounter fluctuations in service requests. Jong et al. (2019) contends that a well-planned and meticulously organized quality management process is crucial for maintaining a consistent flow in service delivery. Quality management practices are carried out through three distinct levels of management: planning, implementation, and monitoring and evaluation (Wambui, 2013; Fundin, et al., 2017; Jong et al., 2019). Each phase of quality management necessitates specific practices that quality managers must execute in order to enhance efficiency in service delivery. These phases, alongside their respective practices, will be elucidated in the subsequent sections.

➢ *Planning*

Planning entails the formulation of objectives and the development of strategies to achieve them. It serves as the foundation for initiating efforts in quality management across various activities and is imperative for the success of any quality management initiative. As per Davies and Kochar (2002), this phase plays a crucial role in the allocation of limited resources. Therefore, planning can be defined as the process of making decisions beforehand regarding what needs to be done, how it should be done, where it should be done, when it should be done, who should be responsible for it, and how the predetermined organizational goals can be attained. In the realm of quality management, planning marks the inception of the entire process, leading up to the implementation, monitoring, and evaluation of the quality management process as a whole. Numerous studies, such as those conducted by Oballah et al. (2015), Obgala et al. (2014), Masudin and Kamara (2018), and Jong et al. (2019), have highlighted that the planning phase of quality management encompasses the following key aspects:

- *Establishment of Quality Management Goals and Objectives:*

This phase involves quality managers defining and setting forth their objectives for both the short and long term. According to Sarkar (2021), these goals and objectives must align with the overarching corporate management objectives. Typically, the goals and objectives of quality management are established by senior management to guide the activities of quality managers. For instance, the research by Karanja and Kiarie (2015) demonstrates that while setting goals and objectives for quality management can establish expectations for service delivery processes and the required inventory and personnel standards in production, the absence of defined short- and long-term quality management objectives could impede the attainment of standard operating procedures, inventory levels, and personnel standards, ultimately resulting in subpar service delivery.

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- *Forecasting and Budgeting.*

As per Basheka (2017), the concepts of forecasting and budgeting are closely connected. Competent managers should predefine the procedures for managing quality, taking into consideration the time required, as well as estimating the expenses associated with implementing these quality management procedures. Oballah et al. (2015) posit that projection and financial planning need to be conducted regularly to ensure that organizations follow a series of protocols that lead to high levels of service provision. Consequently, an inadequate projection and financial planning for quality management costs could prevent organizations from accessing high-quality inventory and personnel, as well as lead to the improper application of quality control standards necessary for effectively achieving service goals. In such cases, service managers would face significant pressure in meeting service objectives.

- *Establishing Performance Standards.*

Establishing performance standards is crucial for enhancing organizational effectiveness. Just as various departments utilize performance metrics to gauge effectiveness, quality managers must implement performance indicators to pinpoint where to focus their efforts. According to Wambui (2017), quality managers can utilize multiple standards as a roadmap for operational enhancement. These standards may include metrics like the average time for inventory supply, service delivery time, price-quality ratio, and client feedback. As noted by Beshah and Kitaw (2014), quality managers who neglect performance standards risk lacking insight into areas requiring improvement, ultimately impacting service delivery. Wambui (2017) further highlights that when quality managers are unable to identify weaknesses in their operations over time, it hinders service delivery goals. For example, a manager unaware of the average service request time may face delays in fulfilling such requests, consequently diminishing the organization's revenue.

- *Developing Policy Framework for Quality Management.*

Developing a policy framework for quality management is crucial. This framework provides clear guidelines for communication, service requisition and delivery timelines, as well as roles and responsibilities for line managers and workers. According to Wambui (2017), a quality management team without a policy framework operates blindly, potentially impacting organizational operations. The absence of a policy direction for quality managers can result in the implementation of ad hoc quality management measures, leading to detrimental effects on organizations, especially those in the service industry. Ad hoc quality management involves addressing quality issues as they arise. Beshah and Kitaw (2014) suggest that relying on ad hoc measures may cause some managers to become lax and unresponsive, ultimately compromising quality and causing delays in service delivery (Karanja and Kiarie, 2015).

➢ *Implementation*

The Second Phase, known as the implementation phase, entails the execution of the various strategies formulated during the planning phase. According to Karanja and Kiarie (2015), this phase is the core of the quality management process, as it involves taking action based on the decisions made during planning. Oballah et al. (2015) contend that while quality management strategies may be sound, inadequate implementation of these strategies can hinder the achievement of quality management goals. Therefore, Oballah et al. (2015) suggest that incorporating effective leadership and thorough supervision during this phase is equally crucial to ensure the successful implementation of quality management.

Service delivery requirements are categorized during this phase. As noted by Chopra and Basheka (2017), this stage involves grouping services together with their respective delivery processes and assigning quality control measures to ensure the delivery of these services meets the required standards. Furthermore, Chopra and Meindl (2007) argue that categorizing services is essential in quality management, as it enables managers to assign performance metrics to evaluate the quality of service provided. For instance, in the construction industry, the quality assessment of concrete works may differ from that of block laying. Therefore, applying the same quality control standards to these distinct works may lead to inaccuracies in quality management processes. Hence, it is crucial to clearly differentiate services based on their performance requirements, allowing managers to effectively implement and evaluate quality control measures (Fundin et al., 2017).

- *Grouping of Service Delivery Requirements.*

According to Chopra and Basheka (2017), this phase is where services are grouped together with the delivery processes and quality control measures assigned to the delivery of these services. Chopra and Meindl (2007) further argue that grouping of services is vital in quality management as it allows managers to assign performance measures to determine the quality of service delivered. For example, in the construction industry, measuring the quality of concrete works may be different from block laying, and therefore assigning the same quality control measures to these works may mislead managers in implementing quality control processes. It is therefore imperative that, services are clearly distinguished on the basis of their performance requirements to allow managers to effectively implement and measure quality control standards (Fundin et al., 2017).

- *Assigning Roles and Responsibilities.*

This practice also involves the assignment of duties to quality management officers. Several duties have evolved in quality management over the years. These include checking of inventory quality, evaluation of personnel suitability for work; supervision of works, monitoring and evaluation of works among other duties. From this background, Osei Mensah et al. (2013) argue that, quality management employees must at each time be aware of the work they are supposed to do, and which control procedures must be implemented. According to Bailey (2011), the non-

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assignment of roles and responsibilities may create duplication of roles, which may in some occasions lead to erosion of quality from the execution of project objectives.

- *The use of Quality Management Method.*

Several quality management methods have evolved over the years in quality management. Notable amongst these methods of quality management include the integrated project management approach, continual improvement, quality assurance, 'six sigma', statistical process control and benchmarking among other methods. It is important for service managers to adopt a good quality management method, as it has implication for services delivery. For instance, the use of methods such as continual improvement approach would require the feedback of clients whereas the quality assurance approach presents a company's reliability of its service delivery to customers (Osei Mensah et al., 2013). Each of these methods requires a different implementation approach and posse different levels of weaknesses. For effective quality management, organisations should adopt a quality management method or a combination of methods that gives the organisation competitive advantage.

- *Allocation of Resources.*

This is one of the important aspects of the phase of implementation of quality management practices. This is the practice of allocating monetary resources to the various quality management activities that require finance. According to Hollis (2006), organisations may forecast and budget in their plans to promote quality management, but the actual release of the budgeted funds for these activities is imperative to the realisation of quality control objectives. According to Lucey (2009), some departments within the quality control unit may need more funds than others, and it is important that quality managers ration the allocation of resource to areas where they are most needed to prevent waste. According to Oballah et al. (2015), the misallocation of funds to quality control units may result in the inability to effectively implement quality control activities needed for effective service delivery.

- *Supervision of Quality Control Processes.*

Supervision of quality control is important as it helps in ensuring that, employees implement predetermined quality control processes in service delivery. According to Oballah et al. (2015) the quality of supervision in quality management is as good as service delivery itself. Supervision ensures that quality managers keep note of service delivery standards and the extent to which they are applied in the production process. Fundin et al. (2017) opines that, it is an essential aspect of implementation of quality management practices as it influences mangers' decision to make changes in the course of service delivery. From this background, if supervision is omitted or ineffectively carried out, some quality control measures would be omitted in the production process which may affect end-product quality.

➢ *Monitoring and Evaluation*

Monitoring and evaluation represent the final stage of the quality management procedures, aiming to guide, oversee, and assess the various quality management policy alternatives established during the initial planning phase. This serves as a review of the execution phase to guarantee that the implementation measures are carried out as intended. Therefore, as per Fundin et al. (2017), this marks the concluding phase of the quality management process where objectives and aims are translated from planning data into finalized programs. At this juncture, the quality manager must verify that the quality management program was executed in accordance with the blueprint. This stage also ensures that any deviations in implementation actions are rectified and areas necessitating alterations in implementation strategy are revisited. Moreover, this phase encompasses the evaluation of the quality management plan's performance and suggests modifications if necessary. The activities typically undertaken during this phase are detailed as follows:Supervision of the quality management plan. Monitoring the quality management plan is crucial as it aids in determining the plan's success rate. Monitoring guarantees that quality managers take note of quality control areas requiring immediate attention. Jong et al. (2019) argue that this is a critical aspect of implementing quality management practices as it impacts quality managers' decisions to either re-plan or enhance the existing quality management program. Monitoring and evaluation for quality management include the following practices:

- *Monitoring of Quality Management Plan.*

Monitoring of quality management plan is important as it helps in determining whether the plan has been successful or not. Monitoring ensures that quality managers keep note of quality control areas that require immediate attention. Jong et al. (2019) are of the view that, it is an essential aspect of implementation of quality management practices as it influences quality mangers' decision to re-plan or improve existing quality management programme.

- *Measurement of Performance of Quality Management.*

Performance measurement is crucial in evaluating the effectiveness of quality management. Similar to how other departments assess performance to gauge effectiveness, quality managers must utilize appropriate indicators established during the planning phase to measure performance. This aids managers in pinpointing areas of weakness to focus their efforts on. According to Fundin et al. (2017), performance measurement can include metrics such as average service delivery time, average inventory delivery time for operations, average inventory usage time, responsiveness to client needs, client feedback, and the price-quality ratio. Quality managers who neglect performance measurement may be unaware of which areas of their operations require improvement, leading to potential negative impacts on service delivery (refer to Beshah and Kitaw, 2014). Oballah et al. (2015) note that a failure to identify weaknesses in their activities over time can impede service delivery objectives in future operations (see also Beshah and Kitaw, 2014). Oballah et al. (2015) observe that, when quality managers are not able to determine the weak

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aspects of their activities for a period of time, service delivery objectives are affected in future operations.

- *Paying Attention to the Details of Resource use and Costs.*

Attention to the details of use and costs is also vital in the evaluation phase of quality management practices. Paying attention to usage would reveal whether resources are underused or overused in the quality management process. Paying attention to costs is also a good indicator of whether quality managers are performing quality control tasks at a higher cost than usual. This enables management to put in place measures to optimize the cost of embarking on such activities. According to Osei Mensah et al. (2012), when quality managers do not pay attention to the cost of quality control, resources may be wasted which may contribute to overall service delivery costs, hence reducing the organisation's margin of profit. The quality management practices are summarised in Table 1

Table 1 Summary of the Quality Management Practices

Planning Practices	**Variable**
Establishment of quality management goals and objectives	PP1
Forecasting and Budgeting	PP2
Establishing performance Standards	PP3
Developing policy framework for quality managing	PP4
Implementation Practices	**Variable**
Grouping of service delivery requirements	IMP 5
Assigning roles and responsibilities	IMP6
The use of quality management method	IMP7
Allocation of resources	IMP8
Supervision of quality control processes	IMP9
Monitoring And Evaluation Practices	**Variable**
Monitoring of quality management plan	MEP 10
Measurement of Performance of quality management	MEP 11
Paying attention to the details of use and costs	MEP 12

C. Information Technology

Information technology (IT) has been recognized as a potent tool in the correlation between quality management (QM) and organizational performance, particularly in terms of production efficiency and cost reduction (Ali et al., 2017; Yu et al., 2010). Within the Quality Management system, information serves as the pivotal instrument that connects various quality management stakeholders. This is perceived to be rooted in a quality management network (Ipek et al., 2011), where closer connections can effectively facilitate quality management for enhanced performance (Yu et al., 2010). By enhancing Information Technology (IT), unstable and stagnant areas within the company's QM can be pinpointed and improved to boost process performance (Sarkar, 2016), necessitating a delicate balance of external dialogue for operational harmony (Wu et al., 2015). Through a collaborative partnership and information exchange, Toyota's quality management affiliates were able to elevate their service excellence levels (Cha et al., 2014). Hence, it is imperative for organizations to share vital information to fortify their partnerships.

Nevertheless, despite this commendable notion, there are significant challenges in the quest for information exchange within the quality management system (Calderon-Monge et al., 2023). Issues such as lack of confidence in the system (Chartterjee et al., 2022), bullwhip effects, risks of information leakage, and varying levels of information (Yu et al., 2010) can lead to quality management complications if not handled with utmost care. These challenges hinder the achievement of effective information sharing among members in the chain (Dery et al., 2017), resulting in biased information sharing within the tangible quality management framework.

Numerous studies have highlighted the benefits of Information Technology (IT) in fostering collaboration between quality management parameters (Ipek et al., 2011). For example, technology has empowered organizations to make strategic decisions regarding procurement, production planning, capacity allocation, and material scheduling (Cheng et al., 2013). Consequently, the construction industry faces pressure to deliver products of exceptional quality, durability, and affordability amid escalating costs.

Many studies predominantly focus on "one-to-one"or "one-to-many"quality management relationships (Chartterjee et al., 2022), overlooking the significance of "many-to-one"connections (Dery et al., 2017). Information can be shared in three main ways: horizontally, vertically, and holistically (Calderon-Monge et al., 2022). Horizontal sharing involves information exchange among buyers, vendors, or competitors, while vertical sharing entails communication between buyers and vendors. Total information sharing combines vertical and horizontal data, which can enhance QM performance and bolster organizational profit margins (Richard et al., 2009).

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Information technology has often been communicated ambiguously to QM partners, leading to misinterpretation of measurement requirements and production quotas (Ipek et al., 2011). While organizations strive to enhance their inter and intra relationships through information sharing, they encounter risks such as opportunistic behavior by partners exploiting system weaknesses, ineffective linkages, and reluctance to learn from one another (Derry et al., 2023). To address this, fostering effective information sharing among partners will significantly impact an organization's QM practices (Zhong et al., 2016). Misinterpretation of information can result in substantial damage, including reduced accuracy, moderate demand adjustments, and treating materials as universal entities (Dery et al., 2017).

Bashuna (2013) conducted a study on the factors influencing the efficient management of work quality in Nakuru North Sub-County. The study relied on data from quality heads of 30 departments and services. It revealed that work quality was hindered by inadequate project funding, lack of accountability, low IT adoption, and the ineffective internal control system utilized in the organizations. Therefore, it was recommended that the government should enhance the existing quality policy to improve project funding adequacy and efficiency. In a study by Gulin et al. (2016) on "the impact of technology transfer performance on total quality management and quality performance,"there was a positive and stable effect on total quality management but an insignificant impact on quality performance.

Huo et al. (2014) reiterated the importance of integrating IT to achieve optimal performance in quality management, focusing primarily on product quality, distribution, pricing, and customer service as key performance indicators for quality management competitiveness. Previous studies have explored the relationship between quality management practices and organizational performance (Kaynak, 2003), indicating that these practices lead to improved quality and productivity. High-quality products are likely to result in satisfied customers (Kaynak, 2003).

D. Organisational Performance

Businesses, enterprises, or establishments that aspire to achieve excellence must carefully select the performance metrics to maintain. These businesses must ensure that their performance metrics align with the necessary benchmarks outlined in the business framework (Chia et al., 2009). Performance management stands as a fundamental component of the organizational structure, with researchers proposing diverse methods to gauge it. In various studies, performance metrics have included aspects such as quality, timeliness, and delivery (Bolatan et al., 2016). Organizational performance predominantly focuses on the business's performance within the network distribution channel, encompassing the overall conduct of the enterprise and the array of entities involved in service delivery channels (Flynn et al., 2010).

As per Ipek et al. (2011), organizational performance can be assessed through four key constructs, namely "costs, asset utilization, quality management reliability, and quality management flexibility and responsiveness."Bryan-Jean et al. (2010) observed enhanced customer satisfaction in areas like cost reduction, timely product delivery, and customer loyalty when evaluating quality management performance based on cost, time, and loyalty dimensions. Other researchers have highlighted operational performance as a driver of organizational success, as evidenced by Yu et al. (2014) in their study on Integrated Green Management and operational performance. In a separate investigation by Devaraj et al. (2007) examining the relationship between eBusiness capabilities, production information integration, and operational performance, operational performance was assessed across dimensions such as cost, quality, flexibility, and delivery. Moreover, Vikas et al. (2017) analyzed dimensions like operational performance, production flexibility, inventory turnover, order fulfillment rates, and total logistics costs within the context of quality management performance.

Li et al. (2006) narrowed down organizational performance to encompass productivity enhancement, reduction in service backlog, shorter lead times, increased input efficiency, and higher revenue generation. Bagheri et al. (2014) delved into financial performance, organizational performance, and non-financial performance as key components of firm performance. Researchers have explored a myriad of performance measures across different studies due to the range of variables under examination. The diverse performance indicators outlined by various authors are also summarized in Table 2.

Table 2 Organizational Performance Proposed by Different Authors

Author (s)	Performance Indicators
Samson and Terziovski (1999)	“Customer satisfaction, Employee morale, Productivity, Quality Output, Delivery”.
Kuei et al. (2001)	“Cost savings, earning growth, productivity, employee satisfaction, sales growth”.
Kaynak et al. (2003)	“Inventory Management, Quality performance, Financial and market”.
Bruque-Camara *et al.* (2016)	Delivery, Flexibility
Demirbag et al. (2006)	“Revenue growth, Profit, Investment amount, Product development, Market”
Lakhal et al. (2006)	“Financial, Operational, Product Quality”

Source: Adoted from Jamaluddin et al. (2015)

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E. Theoretical Review: Attribution Theory (AT)

Attribution theory is a psychological theory that examines how individuals interpret events and actions, as well as how they attribute reasons to these events and actions. When evaluators believe that other individuals would have acted differently in a given situation, they tend to attribute the outcome to the individual (Chao, 2019). Conversely, when evaluators believe that others would have acted similarly, they tend to attribute the outcome to the situation. The former scenario is known as internal or dispositional attributions, while the latter is referred to as external or situational attributions (Malle, 2011). Therefore, individuals are more likely to attribute the behavior of others to internal characteristics and their own behavior to external circumstances, especially in cases where negative actions are observed. As a result, evaluators are expected to use the absence of quality control as a benchmark to determine if quality managers are negligent. Quality managers are more likely to face consequences when they fail to detect common fraudulent activities that could lead to decreased revenues, especially when it is believed that the fraud could have been prevented by the quality managers. The responsibility of quality managers in detecting fraud is closely linked to the notion that they are held accountable when they overlook fraud risks that have been previously identified. Attribution theory, therefore, encourages quality managers to assess and report on the efficacy of internal controls within organizations.

Quality managers are expected to enhance their understanding of existing quality control measures, evaluate the design and implementation of these controls, and test their operational efficiency. This is crucial for the reliance on quality managers and potentially streamlining other significant quality processes to ensure revenue generation. Hence, evaluators can use the effectiveness of quality management processes as a basis for determining negligence if quality managers fail to identify project failures related to quality control. This theory is pertinent to this study as it implies that accountable parties should be held responsible when low quality construction projects are delivered, with quality managers, often referred to as the "guardians of quality assurance, “being the most likely candidates for accountability if inadequate quality services are provided. Therefore, the implementation of efficient quality management practices is essential, and this study aims to evaluate this aspect within the context of construction organizations in Accra, Ghana.

F. Empirical Review

Considerable research has been conducted to investigate the impact of quality management on the attainment of organizational goals. Fundin et al. (2017) concluded in their research that there exists a significant correlation between quality management and the performance of construction firms. Therefore, quality management plays a pivotal role in enhancing organizational productivity. A strong positive relationship was identified between effective quality management and organizational profitability. Ashokkumar's (2014) study emphasized the crucial role of quality management in the success and expansion of construction organizations.

Jong et al. (2014) conducted a study to explore the connection between efficient quality management systems and organizational performance within the Malaysian Construction Industry. Their findings revealed that companies can benefit from quality management practices through improved storage and retrieval of quality data, enhanced service efficiency, and reduced operational costs. The research also highlighted the importance of operational feasibility, the utility of quality control management in addressing customer-related issues, and the cost-effective techniques implemented to boost organizational performance.

Beshah and Kitaw (2014) conducted a review focusing on quality implementation and operational efficiency in the Ethiopian manufacturing and service sector. Through a descriptive cross-sectional survey design, it was discovered that flexibility, cost, time, and resource quality were critical factors ensuring overall quality implementation. The study concluded that an increase in efficient resource utilization would lead to an improvement in quality performance. Consequently, organizations should introduce stringent internal controls to streamline their quality assessment processes.

Beshah and Kitaw (2014) did a review on the quality execution and functional effectiveness in in Ethiopian manufacturing and service industry. Utilizing expressive cross-sectional review plan, it was uncovered that adaptability, cost, time and resource quality guaranteed quality execution generally. The concentrate thusly reasoned that an expansion in amplified asset usage would prompt an increment in the quality execution. Subsequently, organizations ought to present severe inward controls appropriate for smoothing out in its quality assessment procedures.

Osei Mensah et al. (2012) evaluated the critical success factors for the implementation of quality revolution in the public sector of Ghana. According to the assessment, quality procedures are highly important in the presentation of organisations, and that public institutions use regulations and standards in quality management for the delivery of services. The study suggested that the public organisations ought to utilize IT framework in their service quality pursuits to guarantee speed, reduce cost and simplify acquisition of inventory and delivery of services.

G. Conceptual Framework

The framework illustrates the connection between the independent and dependent variables, as depicted in Figure 2.1. Previous research has presented varying results from the resource-based theory literature. Therefore, this study integrates Attribution Theory to gain insight into the phenomenon within this model. The framework proposed in this study posits a direct relationship between Quality Management Practices and performance, with Information

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Technology serving as a moderating factor in the Ghanaian construction sector, as illustrated in Figure 1 below.

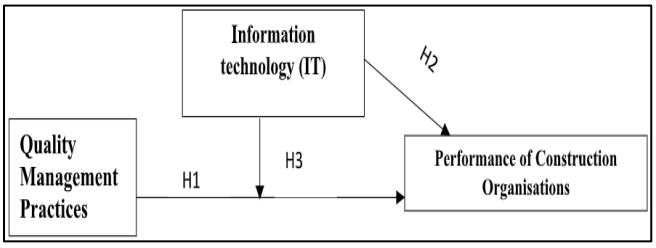

Fig 1 Conceptual Framework

H. Hypothesis Development

From the review of literature foregoing, it was found out that quality management constitute a broad managerial function that has the tendency to improve performance and increase profit levels, if handled very well. From the conceptual framework, three major hypotheses are developed as follows:

- *Positive Relationship between the Implementation of Effective Quality Management Practices and Performance of Construction Organisations*

According to Jong et al. (2019) and Ashokkumar (2014), it is commonly accepted that efficient construction service delivery is made possible by successful implementation of quality management practices. Similar to how different elements of an effective quality management policy have different effects on the quality management processes, good quality management practices encourage honesty and integrity throughout the quality management cycle and have a favorable impact on performance (Jong et al., 2019). The study of Fundin et al. (2017) also supports the idea that better service delivery occurs in areas with good quality management practices. Therefore, we can hypothesize that:

- ***H_1:*** *There is a positive relationship between the implementation of effective quality management practices and performance of construction organisations.*

- *Positive Relationship between Information Technology Integration and Performance of Construction Organisations*

Transparency enables the company to deliver high-quality services by ensuring that the goods, works, and services is purchased at its highest caliber and proper specifications. This can only be achieved through integrated information technology system (Ashokkumar, 2014; Jong et al., 2019). Furthermore, Aquilani et al (2017) adds that integrated information technology in quality management makes up a crucial component of contemporary quality management, hence the potential to improve institutions, including the construction industry, and successfully delivering service. It can thus be hypothesized that:

- ***H_2***: *There is a positive relationship between Information technology integration information and performance of construction organisations.*

- *Information Technology Integration has a Moderation Effect on the Relationship between the Implementation of Effective Quality Management Practices and Performance of Construction Organisations*

A comprehensive quality management system should have integrated IT as well as trained employees who are strengthened with the knowledge and skills necessary to buy certain items or services (Hoonakker et al., 2010; Fundin et al., 2017). Ashokkumar (2014) notes that poor planning and controlling of the quality management process is one drawback of most quality management methods. Beshah and Kitaw (2014) subsequently observed that, this can be done cautiously and thoroughly with the use of computerized and integrated quality management, which will serve as a crucial tool for ensuring organisations operate well. It can therefore be hypothesized that,

- ***H_3***: Information Technology has a moderation effect on the relationship between the implementation of effective quality management practices and performance of construction organisations.

III. RESEARCH METHODOLOGY

The study would use the Survey Design where only quantitative data would be collected using the questionnaire (with close ended questions) as the instrument. According to Kothari (2004), surveys are effective in collecting responses from a large group of respondents, which allows effective generalizations to be made about a study's population. The use of surveys would therefore allow for the involvement of a large number of respondents from the study organisation, and therefore making it fairly accurate to generalize the findings of the study. Saunders et al. (2019) however observe that, the use of the Survey Design does not allow the researcher to obtain an in-depth explanation of the variables of a study. Nonetheless the Survey Design allowed the study to include more respondents and effectively limit them to the specific areas that are required in the study.

According to Singh and Masuku (2014), the population of a study is the entire group of volunteers that satisfy the criteria established for that particular study. According to Sekaran and Bougie (2016), a population is any group of people, occasions, or interesting objects that a researcher is interested in studying. According to the researcher, a study population is a collection of individuals having comparable features from whom a generalization can be drawn. The study population should always be mentioned during research because it helps define the investigation's scope in terms of the subjects that must take part in the study. Once more, it helps the researcher choose an appropriate sample size for the study. The project managers of construction companies in the Greater Accra Region formed the study's population. In this Region, there are about 305 companies actively involved in construction (Registrar General's Department, January 2024). The study targeted all 305 construction companies however; responses from 255 of these companies were actually obtained and used for the analysis representing a response rate of approximately 83.6%

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Since the field data was correctly organized, quantitative data analysis was eventually achievable. The information obtained was organized and reported using tables, graphs, and descriptive statistics like means, standard deviations, and percentages. In addition, indexing was used to rank the quality management practices implemented by construction companies in the study area. The tools for processing and analysing the collected data would be Microsoft Excel 2016 and IBM SPSS Version 21. Correlation and regression analysis was used to determine the relation between effective quality management and the performance of construction companies in Accra, where performance was set as a dependent variable whereas quality management practices and IT were the independent variables. The moderating effect was measured by setting the interaction between quality management practices and IT as independent variables in the regression model. The Process macro-Hayes was used to perform the regression analysis to determine the moderation impact of IT on the relationship between quality management practices and the performance of construction companies.

IV. RESULTS AND DISCUSSION

The analysis of the data received from the study's respondents is presented in this section. The chapter provides information on the results of applying quality management practices and the impact on construction organizations' delivery. In total, 305 questionnaires were administered to construction project managers in Accra. However 255 questionnaires were retrieved constituting a response rate of 83.6%. This meant the views of the majority of the construction project managers were used for the analyses; hence the findings of the study are reflective of the majority of the companies targeted for the study. The demographic information has been summarised and presented in Table 3.

Table 3 Demographic Factors

Category	Demographic factor	Percent (%)
Gender of respondent	Male	58.8
	Female	41.2
Years of services	1-3 years	27.6
	4-6 years	29.3
	7-10 years	32.8
	Above 10 years	10.3
Level of education	Basic education	.0
	Secondary/Voc./Tech.	.0
	Diploma	37.3
	Bachelors' degree	43.1
	Postgraduate Degree	19.6

Source: Field Survey, March 2024

Table 3 shows the respondents response in relation to their gender groups. It was observed that, the majority (58.5%, N= 255) were males with the remaining 41.5% of the respondents being females. This constitute a male to female ratio of almost 3:2, meaning a balance between the two gender groups was almost achieved, hence the findings of the study were not highly skewed toward one gender group and allowing for effective generalization of the findings.

Table 3 illustrates the outcomes of the research concerning the tenure of service of the participants. The analysis indicated that the majority (31.7%, N= 255) of respondents had been employed for 7-10 years. Following this, 29.3% of participants had 1-3 years of experience, and an additional 29.3% had 4-6 years of experience. A small fraction of respondents, accounting for 9.8%, possessed over 10 years of experience. These results imply that most respondents have substantial experience in the realm of services provided by construction companies, enabling them to provide accurate and reliable feedback on the various Quality Management practices implemented by these companies.

Furthermore, the research disclosed that the majority (41.5%, N= 41) of participants held Bachelor's degrees. This was trailed by 39% with Diploma qualifications, while 19.5% had postgraduate degrees. This indicates that the majority of respondents were highly educated, positioning them to provide high-quality responses regarding the execution of Quality Management practices.

- *Quality Management Practices*

This section focused on identifying the quality management practices implemented in Construction organisations in Accra. A survey was conducted on the quality management practices obtained from literature, and the findings of the study are summarised in Table 4.

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Table 4 Quality Management Practices Implemented by Construction Organisations

Quality management Practices	Min.	Max.	Mean	Standard Dev.
Measurement of Performance of quality management unit	3	5	4.16	0.42
Allocation of resources for quality control	2	5	4.12	0.74
Forecasting and Budgeting for quality control	3	5	4.04	0.28
There exist clear goals and objectives for managing quality control processes	3	5	4.00	0.63
Supervision of quality control processes	3	5	4.00	0.6
Grouping of service delivery requirements	3	5	3.98	0.47
Assigning roles and responsibilities	3	5	3.96	0.49
The use of quality management method	3	5	3.94	0.31
There are performance Standards for quality measurement	2	5	3.88	0.91
There exists a policy framework for quality management of construction processes	2	5	3.88	0.59
Paying attention to the details of costs of resources for quality control	2	5	3.88	0.59
Monitoring of quality management plan	2	5	3.76	0.62

Source: Field Survey, March 2024

Table 4 presents the views of respondents in relation to the Quality management practices implemented by construction organisations in Accra. The study revealed that a mean response ranging from of 4.16 to 3.76 suggests that, the average respondent agreed that, construction organisations implement all the quality management practices stated in Table 4. This notwithstanding, practices such as the measurement of performance of quality management unit; allocation of resources for quality control; forecasting and Budgeting for quality control; existence of clear goals and objectives for managing quality control processes; and the supervision of quality control processes were highly ranked. The most implemented practice among all the practices was the measurement of performance of quality management unit with a mean response of 4.16 followed by the allocation of resources for quality control; and forecasting and budgeting for quality control activities with mean responses of 4.12 and 4.04 respectively.

The study further revealed that, the average respondent almost agreed to the implementation of quality management practices such as grouping of service delivery requirements; assigning roles and responsibilities; the use of quality management method; availability of performance Standards for quality measurement; existence of a policy framework for quality management of construction processes; attention to the details of costs of resources for quality control; and monitoring of quality management plan. These were evidenced by mean responses ranging between 3.98 to 3.76. Monitoring of quality management plan was the least most implemented quality management practice evidenced by a mean response of 3.76.

The various quality management practices implemented on three different levels (planning, implementation, and monitoring and evaluation) in construction companies have been ranked based on the Mean and Relative Implementation Index (RII) as shown in Table 5.

Table 5 Ranked Quality Management Practices

Quality Management Practices	Mean	Standard Deviation	RII
Planning	3.95	.39	0.790
Implementation	4.00	.20	0.800
Monitoring and Evaluation	3.93	.31	0.786
Overall implementation	3.96	.18	0.792

Source: Field Survey, March 2024

Table 5 presents a ranking of the various quality management practices implemented in construction companies. The ranking indicates that, the practices under implementation were the most executed in the construction companies. This was backed by a mean response of 4.00 and a relative importance index of 0.80 which means that, in about 80% of the times the quality management practices under planning were performed by construction companies holding all the other levels constant. This was followed by the practices under planning with a mean of 3.95 and an RII of 0.790. Monitoring and evaluation practices were the least implemented quality management practice in construction companies backed by an RII of 0.786, meaning, in about 78.6% of the times, construction companies implement monitoring and evaluation practices all other practices being equal. The data also revealed that, construction companies achieved an average RII of 0.792 which means, the chance or likelihood that, Construction companies would implement the quality management practices identified in Table 5, is 79.2%. This means in about 20.8% of the times Construction companies do not implement quality management practices. Once the full likelihood (100%) is not achieved in respect of implementing these practices, the implication is that other quality management practices may

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exist in Construction companies, which this study did not ascertain. Future studies should thus use the qualitative approach to find out more about the other practices, which this study failed to identify.

- *Descriptive Statistics of Performance of Construction Companies*

The study analysed the effects of the various quality management practices on the performance of Construction companies with a moderating role of information technology integration. Several performance indicators that were found after the literature review were used in the survey, and the results are presented in Table 6 below.

Table 6 Descriptive Statistics of Performance of Construction companies

Quality management practices(QMP) and Performance (PERF)	Min	Max	Mean	Std. Dev.
Construction product quality and reliability have improved because of good Quality management practices in the organization	3	5	4.04	0.40
Access time to quality construction inventory has improved due to the implementation of effective Quality management practices	3	5	4.00	0.35
Quality management practices has improved our organizational cost saving through best value for money	3	5	4.00	0.40
Quality management practices have led to growth in revenue of our Company.	3	5	3.96	0.34
Quality management practices have improved the accuracy of construction processes.	3	5	3.94	0.37
Quality management practices has enhanced the timely delivery of construction products.	3	5	3.94	0.42

Source: Field Survey, March 2024

Respondents agreed with an average value of 4.04 (0.40) to "Construction product quality and reliability have improved because of good Quality management practices in the organization". A mean value of 4.00 (0.35) also indicates that, the average respondent agreed that, aaaccess time to quality construction inventory has improved due to the implementation of effective quality management practices. Furthermore, an average response of 4.00 (0.40) represents respondents' agreement to quality management practices improving organizational cost saving through best value for money. The data further showed that, quality management practices have led to growth in revenue of construction companies evidenced by a mean response of 3.96 (0.34). The study revealed an improvement in accuracy of construction processes as a result of the implementation of quality management practices. This was also supported by a mean response of 3.94 which indicates the average respondent's agreement. Lastly is an average response of 3.94 (0.42) indicating agreement to "quality management practices has enhanced the timely delivery of construction products".

- *Descriptive Statistics of Information Technology Integration in Construction companies*

The study analysed the effects of the various Quality management practices on the performance of Construction companies with a moderating role of information technology integration. Several information technology integration indicators that were found after the literature review were used in the survey, and the result are presented in the Table 7.

Table 7 Descriptive Statistics on Information Technology Integration

Statements	Min	Max	Mean	Std. Deviation
IT1 My organization has integrated information technology into its quality management operations and other units to ensure smooth running of information	3	5	4.73	0.493
IT2 Information technology is integrated with the Suppliers database to enhance quality control activities	4	5	4.88	0.325
IT3 Information technology integration has increased transparency in acquisition, distribution, and monitoring of inventory levels	3	5	4.76	0.551
IT4 Information technology integrated in its quality control unit has helped the construction organisation unit to run smoothly	3	5	4.78	0.503
IT5 Information technology integration assist our construction organizations' to communicate with customers' needs resulting in increased accuracy in terms of demand planning	3	5	4.84	0.464

Source: Field Survey, March 2024

Response of 4.73 mean (0.493) indicates an agreement to their organization having integrated information technology into its quality operation and other units in the construction sector to ensure smooth running of information. "Information technology is integrated with the Suppliers database to enhance quality management practices" was agreed upon with an average response of 4.88 (0.325). An average response of 4.76 (0.551) indicates an agreement by respondents to "Information technology integration has increased transparency in acquisition, distribution, and monitoring of inventory levels". A mean response of 4.78 (0.503) indicates an agreement to the statement

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"Information technology integration in Quality unit has helped the construction organisations' unit to run smoothly". Lastly is Information technology integration assist our construction organisations' quality unit to communicate with customers' needs resulting in increased accuracy in terms of demand planning was agreed upon with a mean value of 4.84 (0.464).

➢ *Reliability and Validity Test*

Table 8 below shows the validity and dependability of the used items. Twelve items measuring quality management practices were found to have a Cronbach alpha of 0.849, showing that the items employed were related to the variable and were thus dependable. The average value for Cronbach alpha is 0.7. Additionally, the Cronbach's alpha of 0.839 for performance indicates reliability. Integration of information technology comes last, with a reliability score of 0.870.

Table 8 Reliability and Validity Test

Variables	Cronbach's Alpha	No of Items
Quality management practices	0.849	12
Construction organizations' Performance	0.839	6
Information technology integration	0.870	5

➢ *Correlation Analysis*

The second objective of the study was to investigate the relationship between quality management practices and organisational performance. A correlation analysis was performance and the result is presented in Table 9.

Table 9 Correlation Analysis

		QMP	PERF	IT
QMP	Pearson Correlation	1	.756**	.360*
	Sig. (2-tailed)		0.000	0.012
PERF	Pearson Correlation	.756**	1	.542**
	Sig. (2-tailed)	0.000		0.000
IT	Pearson Correlation	.360*	.542**	1
	Sig. (2-tailed)	0.012	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

The correlation table below shows that quality management practices (QMP) correlates with performance (PERF) with a figure of 0.756 and p=0.000. This suggests that, 75.6 % of the variability in the performance of construction companies could be explained by the implementation of quality management practices, indicating a positive impact. Also, information technology integration correlates with quality management practices with a value of 0.360 and p=0.012. This also implies that, 36% of the variability in the implementation of quality management practices is explained by the integration of IT. This is also indicative of a weak correlation though significant. Lastly, information technology integration correlates with performance of construction organisations' with a value of 0.542 and p=0.000. This also suggests that, about 54.2% of the variability in the performance of construction companies could be explained by the integration of IT in organisational processes.

➢ *Regression Analysis using Process Macro-Hayes*

The Third objective of the study was to investigate the moderating impact of IT integration on the relationship between quality management practices and organisational performance. Regression analysis was performed in this respect and the result presented in Table 10.

Table 10 Regression Analysis

Model Summary

R	R-sq	MSE	F	df1	df2	p
.8050	.6480	.0996	28.8426	3.0000	47.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.4777	.0459	97.5555	.0000	4.3854	4.5700
QMP	.6992	.0994	7.0311	.0000	.4991	.8992
IT	.5090	.1623	3.1368	.0029	.1826	.8354
Int_1	.1977	.1960	1.0089	.3182	-.1965	.5920

Product terms key:

Int_1 : QMP x IT

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0076	1.0179	1.0000	47.0000	.3182

It can be viewed from Table 4.7 that, quality management practices and information technology integration accounts for a 64.8 percent (64.8%) change in performance of construction organisations. Based on the regression analysis above, there are specific boundaries (LLCI) and (ULCI) that the analysis must follow. The basis is there should be no zero between the lower level of confidence interval (LLCI) and the upper-level confidence interval (ULCI). Zero between the intervals indicate a non-

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significant impact of the causal variable on the dependent variable. In relation to the above, it could be viewed that the LLCI for Quality management practices on performance of construction organisations' is 0.4991 and as well as ULCI is 0.8992 with a t value of 7.0311 and a p value of 0.000 indicating a significant positive impact of Quality management practices on construction organisations' performance. Also, it could be seen that information technology integration has a significant direct influence on performance with a p value of 0.000, t value of 3.1368, LLCI of 0.1826 and ULCI of 0.8354. Lastly is the information technology integration as a moderator. Based on the values (p=0.3182, LLCI= -0.1965, ULCI= 0.5920, t= 1.0089) given above, information technology integration does not have a significant effect on the relationship between Quality management practices and construction organisations' performance. Furthermore, linking to the hypothesis developed in chapter two of the study, hypothesis 1(H1) which is Quality management practices has a signification impact on construction organisations' performance is supported (t value= 7.0311) based on the analysis made. Information technology integration has a significant impact on construction organisations' performance as hypothesis 2 (H2) is supported with a t value of 3.1368. Yet, the moderating role of information technology integration on the relationship between Quality management practices and construction organisations' performance as the hypothesis 3 is not supported due to a t value (1.0089) lesser than the standard t value of 1.96.

- *Hypothesis Testing and Findings*

Table 11 Hypothesis Testing

Hypothesis	Relationship	T value	P value	Decision
H1	QMP - - > PERF	7.0311	0.000	Supported
H2	IT - - > PERF	3.1368	0.0029	Supported
H3	IT- - > QMP* PERF	1.0089	0.3182	Not Supported

V. FINDINGS

This section discusses the findings that emerged from the analysis of the data. The discussion offered in relation to findings from the implementation of quality management practices and its relationship with construction organisations' performance and the moderating role of IT is discussed in the succeeding sections.

- *Quality Management Practices and Construction Organisations' Performance*

The study revealed results of analysis pertaining to quality management practices and construction organisations' performance. According to the correlation analysis done, a strong positive relationship between Quality management practices and construction organisations' performance was obtained with a figure of p=0.000 and r=0.749. Also, findings from regression analysis showed a direct strong impact of Quality management practices on construction organisations' performance with a t-value of 7.0311 and coefficient of 0.6992. This implies that Quality management practices impact construction organisations' performance of about 69.92%. This finding relates to the findings of Jong et al (2019), and Ashokkumar (2014), who found out that, efficient construction service delivery is made possible by successful implementation of quality management practices. Similar to how different elements of an effective quality management policy have different effects on the quality management processes, good quality management practices encourage honesty and integrity throughout the quality management cycle and have a favourable impact on performance (Fundin et al., 2017). Furthermore, the study of Acquilani et al. (2017) also supports the idea that better service delivery occurs in areas with good quality management practices. The implementation of effective quality management practices therefore has a positive impact on the performance of construction companies.

- *Information Technology Integration and Construction Organizations' Performance*

The correlation findings indicate a significant relationship between information technology integration and construction organizations' performance with a p value of 0.000 and r value of 0.546. Additional findings from the regression analysis aspect of the study revealed that information technology integration positively and significantly influence construction organizations' performance causing a change of 50.90% with a t value of 3.1368. It could be explained as information technology integration leads to better construction organizations' performance. This finding is in connection with the findings of Fundin et al. (2020) who revealed that information technology integration in construction organisations result in optimized routine work, accurate construction processes, tracking and keeping of records and products, enhanced planning, and forecasting which benefits clients and improves construction organisations' performance. Based on the findings of this study and its relation with previous studies, integrated information technology in quality management makes up a crucial component of organisational performance, hence the potential to improve institutions, including the construction industry, and successful delivery of services.

- *The Moderating Effect of IT Integration on the Relationship between Quality Management Practices and Construction Organizations' Performance*

The study's correlation analysis found a negligible correlation between the moderating effect of information technology integration and a p value of 0.3182. The regression analysis table also revealed that the null hypothesis has a t value of 1.0089. This suggests that the

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relationship between quality management practices and construction organisations' performance is unaffected by information technology. This could be attributed to the construction organisations' system's inability to integrate enough information technology. This finding is contrary to the studies of Hoonakker et al. (2010) who observed that, comprehensive quality management system should have integrated IT as well as trained employees who are strengthened with the knowledge and skills necessary to effectively integrate IT into quality management practices. The integration of IT into quality management serves as a crucial tool for ensuring organisations operate well and achieve a good level of performance.

VI. CONCLUSION

The analyses of the data gathered revealed that, in about 79% of the time, construction companies in the study area implement the quality management practices identified in literature. The most implemented quality management practices included measurement of performance of quality management unit; allocation of resources for quality control; forecasting and Budgeting for quality control; existence of clear goals and objectives for managing quality control processes; and the supervision of quality control processes. The analyses also revealed that, the implementation of quality management practices improves product quality and reliability; access time to quality construction inventory; and organizational cost saving through best value for money. The analysis further showed that, quality management improves revenue and accuracy of construction processes. Based on hypothesis tested, the study concludes that, Information Technology integration has no moderating impact on the relationship between quality management practices and performance of construction organisations.

REFERENCES

[1]. Anane, A. and Kwarteng, G., 2019. Prospects and challenges of procurement performance measurement in selected technical universities in Ghana. Asian Journal of Economics, Business and Accounting, 13(2), pp.1-18.

[2]. Aquilani B, Silvestri C, Ruggieri, A and, Corrado G. (2017). A systematic literature review on total quality management critical success factors and the identification of new avenues of research. The TQM Journal. 29. 184-213. 10.1108/TQM-01-2016-0003.

[3]. Ashokkumar D (2014). Study of Quality Management in Construction Industry. International Journal of Innovative Research in Science, Engineering and Technology, 3, 36-43.

[4]. Bagheri, R., Hamidizadeh, M.R. and Sabbagh, P., 2015. The mediator role of KM process for creative organizational learning case study: knowledge-based companies. Vine, 45(3), pp.420-445.

[5]. Bagshaw, K.B. and Peters, G.T. (2015), "Facility management and organizational effectiveness of manufacturing firms in Rivers State Nigeria", European Journal of Business and Management, Vol. 7 No. 26, pp. 147-156.

[6]. Baily, P. (2011). Purchasing principles and management. (8th edition), London city: Pearons education limited

[7]. ashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru

[8]. North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[9]. ashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru

[10]. North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[11]. ashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru

[12]. North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[13]. ashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru

[14]. North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[15]. ashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru

[16]. North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[17]. Bashuna, A. (2013) 'Factors affecting effective management of the procurement function at Nakuru North Sub-County', International Journal of Business and Management, Vol. 1, No. 7, pp.262–291.

[18]. Beshah, B and Kitaw, D. (2014). Quality management practice in Ethiopia. African Journal of Business Management. 8. 689-699. 10.5897/AJBM2013.1624.

[19]. Brown, B., and Hyer, N. (2010). Managing services: a team-based approach, International Edition, Singapore, McGraw- Hill.

[20]. Bolatan, G.I.S., Gozlu, S., Alpkan, L. and Zaim, S. (2016). The impact of technology transfer performance on total quality management and quality performance. Procedia-Social and Behavioral Sciences, 235, pp.746-755.

[21]. Byrd, T.A. and Marshall, T.E., 1997. Relating information technology investment to organizational performance: A causal model analysis. Omega, 25(1), pp.43-56.

[22]. Calderon-Monge, Esther and Ribeiro-Soriano, Domingo. (2023). The role of digitalization in business and management: a systematic literature review. Review of Managerial Science. 18. 1-43. 10.1007/s11846-023-00647-8.

[23]. Cha, K. J., Lee, Z. K. and Cha, J.S., (2014). 'Strategies for successful supplier relationship management (SRM) in the SI industry', Journal of Society for e-Business Studies 17(3), 105–116.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR2073

[24]. Chartterjee S, Chaudhuri R, Vrontis D, Basile G (2022) Digital transformation and entrepreneurship process in SMEs of India: a moderating role of adoption of AI-CRM capability and strategic planning. J Strat Manag 15(3):416–433

[25]. Daniels, S. R., Wang, G., Lawong, D., and Ferris, G. R. (2017). Collective assessment of the human resources management field: Meta-analytic needs and theory development prospects for the future. Human Resource Management Review, 27(1), 8-25

[26]. Dery K, Sebastian IM, van der Meulen N (2017) The digital workplace is key to digital innovation. MIS Q Exec 16:135–152

[27]. Devaraj, S., Krajewski, L. and Wei, J.C., 2007. Impact of eBusiness technologies on operational performance: the role of production information integration in the supply chain. Journal of operations management, 25(6), pp.1199-1216.

[28]. Flynn, B.B., Huo, B. and Zhao, X., 2010. The impact of supply chain integration on performance: A contingency and configuration approach. Journal of operations management, 28(1), pp.58-71.

[29]. Fundin, A., Lilja, J., Lagrosen, Y., and Bergquist, B. (2020). Quality 2030: quality management for the future. Total Quality Management and Business Excellence, 1–17. https://doi.org/10.1080/14783363. 2020.1863778

[30]. Gulin, Danimir and Hladika, Mirjana and Valenta, Ivana. (2019). Digitalization and the Challenges for the Accounting Profession.

[31]. Ho, L. A. (2008). What affects organizational performance? the linking of learning and management, Industrial Management and Data Systems, 108, (9), 1234–1254

[32]. Hoonakker, P., Carayon, P., and Loushine, T. (2010). Barriers and benefits of quality management in the construction industry: An empirical study. Total Quality Management and Business Excellence, 21(9), 953–969. https://doi.org/10.1080/14783363.2010.487673

[33]. Hussein, I. M. R and Shale, I .N . (2014). Effects of sustainable Quality practices on organizational performance in manufacturing sector in Kenya: a case of Unilever Kenya Limited. European Journal of Business Management, 1 (11), 417-438.

[34]. Jamaluddin, Z, Razali, A. and, Zainol M. (2015). The relationship between quality management practices and organisational performance: A structural equation modelling approach. AIP Conference Proceedings. 1643. 494-504. 10.1063/1.4907485.

[35]. Jong, C. Y., Sim, A. K. S., Lew, T. Y., and Nonino, F. (2019). The relationship between TQM and project performance: Empirical evidence from Malaysian construction industry. Cogent Business and Management, 6(1). https://doi.org/10.1080/ 23311975.2019.1568655

[36]. Kabega, C., Kule, J. W., and Mbera, Z. R. (2016). Effect of Quality practices on performance of public services in Rwanda. International Journal of Economics, Commerce and. Management United Kingdom, IV(5) 377 – 397

[37]. Karanja M. K. and Kiarie D. (2015). Influence of Quality practices on organization performance in private sector in Kenya: a case study of Guaranty Trust Bank Kenya Ltd. International Journal of Business and Law Research 3(2), 44 – 60.

[38]. Kaya, S., Heywood, C.A., Arge, K., Brawn, G. and Alexander, K., 2005. Raising facilities management's profile in organisations: Developing a world-class framework. Journal of Facilities Management, 3(1), pp.65-82.

[39]. Kaynak, H., 2003. The relationship between total quality management practices and their effects on firm performance. Journal of operations management, 21(4), pp.405-435

[40]. Keith, B., Vitasek, K., Manrodt, K. and Kling, J. (2016). Strategic sourcing in the new economy: harnessing the potential of sourcing business models for modern Quality. New York: Palgrave Macmillan.

[41]. Kothari, C.R. (2004). Research methodology: Methods and techniques. New Age International

[42]. Ipek, K, I., Imamoglu, S.Z. and İnce, H., 2011. The relationship between organizational learning and firm performance: The mediating roles of innovation and TQM. Journal of Global Strategic Management, 9(3), pp.72-88.

[43]. Leong, T.K., Zakuan, N., Mat Saman, M.Z., Ariff, M., Md, S. and Tan, C.S., 2014. Using project performance to measure effectiveness of quality management system maintenance and practices in construction industry. The scientific world journal, 2014.

[44]. Li, Suhong and Nathan, Ragu and Ragu-Nathan, T. and Rao, Subba. (2006). The Impact of Supply Chain Management Practices on Competitive Advantage and Organizational Performance. Omega. 34. 107-124.

[45]. Liu, H., Abudayyeh, O. and Liou, W., 2020, March. BIM-based smart facility management: A review of present research status, challenges, and future needs. In Construction Research Congress 2020 (pp. 1087-1095). Reston, VA: American Society of Civil Engineers.

[46]. Lucey, T., (2009), "Costing",7th ed. London. Cengage Learning.

[47]. Makabira D. K. and Waiganjo E. (2014). Role of Quality practices on the performance of corporate organizations in kenya: a case study of Kenya National Police Service. International Journal of Academic Research in Business and Social Science. 4(10), 369 – 389.

[48]. Malakooti, B. (2013). Operations and Production Systems with Multiple Objectives. John Wiley and Sons.

[49]. Malle, B.F., 2011. Time to give up the dogmas of attribution: An alternative theory of behavior explanation. In Advances in experimental social psychology (Vol. 44, pp. 297-352). Academic Press.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR2073

[50]. Mchopa A., Njau E., Ruoja C., Huka H., and Panga F. (2014) The achievement of value for money in Tanzania public Quality: a non-monetary assessment approach. International Journal of Management Sciences 3(7), 524 – 533

[51]. Mendell, M.J. and Heath, G.A. (2005). Do indoor pollutants and thermal conditions in schools influence student performance? A critical review of the literature. Indoor air, 15(1), pp.27-52.

[52]. Masudin, I. and Kamara, M (2018). Impact of just-in-time, total quality management and supply chain management on organizational performance: A review perspective. Jurnal Teknik Industri, 19(1), pp.11-20.

[53]. Neely, A., Gregory, M. and Platts, K., (2005). Performance measurement system design: A literature review and research agenda. International journal of operations and production management, 25(12), pp.1228-1263.

[54]. Oballah D., Waiganjo E., Wachiuri E. W. (2015). Effect of inventory management practices on organizational performance in public health institutions in Kenya: A case study of Kenyatta national hospital. International Journal of Education and Research, 3(3), 703–714.

[55]. Odero, J.A. and Ayub, S.E., 2017. Effect of procurement practices on procurement performance of public sugar manufacturing firms in Western Kenya. International journal of management research and reviews, 7(4), p.521.

[56]. Osei Mensah, J, Copuroglu, G and Fening, F. (2013). Total Quality Management in Ghana: Critical Success Factors and Model for Implementation of a Quality Revolution. Journal of African Business. 13. 123-133. 10.1080/15228916.2012.693444.

[57]. Patrucco, A.S., Walker, H., Luzzini, D. and Ronchi, S., 2019. Which shape fits best? Designing the organizational form of local government procurement. Journal of Purchasing and Supply Management, 25(3), p.100504.

[58]. Praveen, N. and Khaliq, M., 2018. A general study for role of the quality in the e-procurement process. International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 3(1), pp.102-106.

[59]. Richard P., Devinney T. M., Yip G. S. and Johnson G. (2009). Measuring organizational performance: towards methodological best practice. Journal of Management, 35(3) DOI: 10.1177/01492063 08330560

[60]. Saunders, M.N.K., Lewis, P. and Thornhill, A. (2019) Research Methods for Business Students. 8th Edition, Pearson, New York.

[61]. Sarkar, A (2021). Importance of IOT in facility management. International Journal of Recent Scientific Research, 12(6), p.41870.

[62]. Sekaran, U. and Bougie, R (2016). Research methods for business: A skill building approach. john Wiley and Sons.

[63]. Singh, A.S. and Masuku, M.B. (2014). Sampling techniques and determination of sample size in applied statistics research: An overview. International Journal of economics, commerce and management, 2(11), pp.1-22.

[64]. Tukuta M. and Saruchera F. (2015). Challenges facing Quality professionals in developing economies: Unlocking value through professional international purchasing, 9(1), 9. doi:10.4102/jtscm. v9i1.152

[65]. Vikas M, Sulabh S. (2017). Organisational Climate: A Conceptual Perspective. International Journal of Management and Business. 7 (1), 113-132

[66]. Wambui, E. N. (2013). Role of Quality on organization performance; a survey study of public secondary schools in Imenti North District, Kenya. International Journal of Social Sciences Entrepreneurship, 1(3), 289 – 302.

[67]. Wu, S.P.J., Straub, D.W. and Liang, T.P. (2015). How information technology governance mechanisms and strategic alignment influence organizational performance. MIS quarterly, 39(2), pp.497-518.

[68]. Upadhaya, B., Munir, R., and Blount, Y. (2014). Association between performance measurement systems and organizational effectiveness. International Journal of 55 Operations and Production Management, 34(7)

[69]. Yu, W., Ramanathan, R. and Nath, P., 2014. The impacts of marketing and operations capabilities on financial performance in the UK retail sector: A resource-based perspective. Industrial Marketing Management, 43(1), pp.25-31.

[70]. Zhong, R.Y., Newman, S.T., Huang, G.Q. and Lan, S., 2016. Big Data for supply chain management in the service and manufacturing sectors: Challenges, opportunities, and future perspectives. Computers and Industrial Engineering, 101, pp.572-591.