

## **Benchmarking competency and quality management practices among SMEs in Uganda: Does ICT robustness matter?**

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### **Abstract**

*The purpose of this study was to assess the interaction effect of ICT robustness on the relationship between benchmarking competency and Quality Management Practices (QMP) among Small and Medium scale Enterprises (SMEs). The study adopted a mixed method approach that involved analysis of both quantitative and qualitative data in a cross-sectional survey involving 250 SMEs in Uganda. Results indicate that there exists a positive and significant relationship between benchmarking competency and QMP among SMEs in Uganda. However, ICT robustness has no significant interactive effect on the relationship between benchmarking competency and quality management practices among SMEs in Uganda. Despite this, it was found that adoption of robust ICT applications would revolutionize QMP among SMEs in the developing world if the relevant parties would address the impediments in infrastructural set-ups. There is also a need to establish business networks with those firms perceived better if SMEs are to offer desired quality products to the more informed customers.*

**Key words:** Benchmarking, Quality Management Practices, ICT, SMEs.

### **Introduction**

In the recent past, the business environment has become gradually unpredictable and this has constrained Small and Medium Scale Enterprises (SMEs) to benchmark Quality Management Practices (QMP) that align to the ever-changing customer preferences. To obtain relevant information from external sources that supports the internal re-alignment, there is need to mobilize resources that support planning, needs assessment and integration of the needed interventions to support operations. Most SMEs in low income countries have tended to look up to market leaders to apt their operations in order to remain competitive in the market place. It is imperative to note that the progressive developments in Information and Communication Technology (ICT) have empowered SMEs to determine products that resonate well with the customer needs. Some firms have adopted technology support services to reposition themselves in the quality management value chain.

It has been observed that QMP relate to activities that firms carry out to meet the product value desired by their clientele (Nguyen, Phan & Matsui, 2018). Quality systems are regularly linked to large organizations much as empirical works of Raisova (2014) depict that the practice is increasingly becoming relevant to SMEs and considerably contributes to their performance. Although there exists a host of interventions to realize the quality objective, several SMEs have preferred to understudy the industry best practice as an alternative option (OECD, 2015).

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However, the related efforts which lead to adoption of superior operations principles recommended by national and international quality management systems should be carried out consciously to avoid the likely legal battles. Moderation studies that test for the role of ICT robustness on benchmarking competency and QMP are rare. In respect, Eniola et al. (2019) focused on a direct relationship between organizational culture and total quality management among SMEs in Nigeria. Additionally, Rahman et al. (2016) empirical works concentrate on an overview of technological innovations on SME survival. Relatedly, Onyinyi and Kaberuka (2019) carried out a study involving ICT fusion on the relationship between resource transformation capabilities and QMP among SMEs in Uganda. In an earlier study, Onyinyi and Kaberuka (2018) focused on the mediation role of resource transformation capabilities on the relationship between knowledge management potential and QMP among SMEs. From the foregoing, there is an apparent knowledge gap on moderation studies in the quality management agenda which this study attempts to address.

In Uganda, SMEs are decisive in stimulating economic growth and development through provision of employment opportunities, improvement in domestic incomes, alleviation of poverty levels and enhancement of Gross Domestic Product (GDP) in the long run (MSMEs, 2015). The sub-sector employs over 2.5 million people with an annual employment growth rate of 25% and contributes 75% to GDP (UIA, 2012). However, 50% of the start-ups have not been able to survive beyond their first year of operation (Abaho et al., 2017). Yet, the global industry survival average is approximately 91.5% (Eurostat, 2015). In low income countries like Uganda, the above scenario is associated with inadequate capital, poor ICT support systems and insufficient human resource capabilities to support adoption of superior systems that deliver the desired quality products (Leboea, 2017). The rest of this paper presents the theoretical underpinnings of the study, literature review, hypotheses development, results and discussion. The final section concerns conclusion and implications of the study.

### **Theoretical foundation and literature review;**

#### ***Quality management practices; Continuous Improvement Theory (Kaizen, 1986)***

Continuous Improvement (CI) theory by Kaizen (1986) assumes that customer needs keep changing and the quest to advance operations performance should be perpetual to support firm survival. The theory emphasizes involvement of multiple stakeholders; internal and external in search for the best practice. It is positively associated with task simplification, waste reduction and teamwork; all directed towards satisfying the customer. Accordingly, continuous improvement is critical in improving efficiencies in the operations value chain, enhancing process yield and obtaining considerable success rate in new product introduction (Assarlind, 2014). Hence forth, SMEs should make all the necessary operational adjustments in light of the industry best practice to deliver the desired product quality. The underlying weakness of (CI) theory is that most SMEs in developing countries lack well-functioning structures and adaptation capability to support the anticipated long-term quality goals; which are crucial in stimulating the desired change. Nonetheless, the theory gives a directional approach to the needed change; specifying what to adjust, how to adjust it, and the desirable outcome as a result (Kaizen, 1986).

#### ***Benchmarking competency and quality management practices among SMEs***

Benchmarking concept is understood to mean an act of comparing one's performance levels against similar firms with higher achievement strides (Ettorchi -Tardy et al., 2012). Khurshid et

al. (2018) posit that SMEs can improve their quality management competencies by adopting and adjusting the basic quality management principles recommended by national and international quality management systems. This can be conducted through a systematic planning, gap analysis and adoption of the desired change. For better achievement in the benchmarking efforts, it is vital to adequately prepare the human resources so that value for money expended is adequately realized. We observe that the global market place has exposed consumers to information necessary for decision making in respected of the desired products fit for consumption (Laroche et al., 2001).

SMEs that attempt to venture into international markets need to adapt quality standards recommended by global management systems (Osano, 2019). Quality management practitioners have emphasized that benchmarking practice is a performance measurement tool linked to world class quality management systems (Talib et al., 2011). Comparison between current organization's quality management approaches with similar and or better performing firms in the group is a hallmark for higher performance achievement levels (Parnell et al., 2012). By this practice, firms set higher targets thereby repositioning themselves strategically in the market place. Hence, imitation and realignment of what has successfully worked for a competitor is one practical element of QMP synonymous with SMEs in modern-day business environment (Saunila, 2014).

Due to a wide spread ICT applications, industrial clients and retail customers are now demanding for quality products and services from SMEs (Laroche et al., 2001). In response, SMEs are striving to cope up with the best practitioners in their respective subsectors to enhance performance improvement (Mbizi et al., 2013). In this respect, firms that continuously improve their systems are capable of sustaining customer unique requirements over time (Khurshid et al., 2018). Benchmarking practice has been part and parcel of continuous improvement philosophy of organizational management approach (Saunila, 2014). Embracing sector novel practices improves a firm's ability to achieve its strategic goals (Jaafreh & Al-abedallat, 2012). Fundamentally, competitive dimensions of quality, cost, dependability and flexibility may be achieved through benchmarking and internal controls (Talib et al., 2011).

Employee involvement provides a conducive platform for success in benchmarking strategy (Dubey , 2014). To achieve the quality goal; strategic benchmarking, top management support and human resource development are essential (Talib et al., 2011). Adaptive SMEs can attain superior performance levels by providing cost effective quality products (Saunila, 2014). In the same measure, Osano (2019) posits that benchmarking is an entrepreneurial competence that enhances firm productivity and competitiveness alongside information search, systematic planning, monitoring and networking. Further; organizational learning, benchmarking and networking advances are key elements of quality management practice for SMEs (Laforet, 2011). Therefore the process of search for the better practice should be complemented with timely feedback system to achieve sustainable results (Jaafreh & Al-abedallat, 2012). The above literature suggests that:

*H<sub>1</sub>: There exists a positive and significant relationship between benchmarking competency and quality management practices among SMEs in Uganda.*

***The interactive role of ICT robustness on benchmarking competency and quality management practices among SMEs in Uganda***

Benchmarking efforts, coupled with technology integration in firm operations determine firm competitiveness required to attain corporate goals (OECD, 2013). In view of the above, Homaid et al. (2015) posit that the key success factors in quality management by SMEs have been associated with complementary efforts including customer focus, training, ICT usability, benchmarking efforts and innovations to ensure continuous improvement undertakings. Further, benchmarking practice has been identified as one of the external determinants for success in technology oriented innovation firms (Saunila, 2014). Hence, in today's volatile environment, strategic benchmarks provide a platform for firm survival through modern technologies that provide support for quality related innovations (Halim et al., 2014).

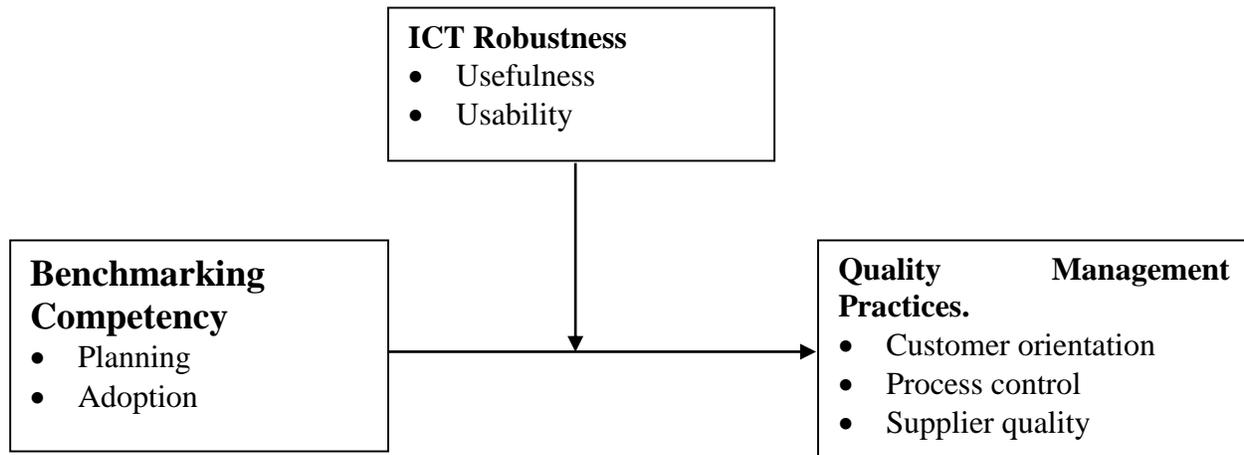
SMEs more often experience resource constraints; hence, copying with desired practice in the environment through adoption of emerging technologies enables them to achieve their strategic goals of providing optimum quality products (Homaid et al., 2015). The practice has been associated with generation of innovative products for competitiveness (Saunila, 2014). Wainwright et al. (2005) relate the above strategy to benchmarking innovations which lead to adoption of unique technologies for sustainable quality performance. Literature seems to support the existence of an interactive effect between benchmarking competencies and ICT integration to firm growth through quality products. As a result, continuous improvement in quality performance is optimally achieved through benchmarking best practice in a ICT oriented firms (Pérez-Aróstegui et al., 2015).

Measuring own performance against market leaders provides basic benchmarks for product innovations in a competitive environment (OECD, 2013). Competitive benchmarking and quality management are precursors of ICT based innovations among SMEs (Darus et al., 2017). Efficiency orientations of a firm are attained through innovativeness to deliver higher performance levels (Ng, Hee Song & Kee, 2013). The first step in innovation success is to plan, identify and adapt to the practices of successful firms in the same industry for the realization of the long term goals (Pérez-Aróstegui et al., 2015). This should be supported by proactive human resources through stepping up their benchmarking capabilities to deliver a firm's overall performance objective (Halim et al., 2014). Hence, perceived ICT usefulness and usability have been identified as close associates of benchmarking success in search for best QMP (Pérez-Aróstegui et al., 2015). Based on literature, we hypothesize that:

*H<sub>2</sub>. The level of ICT robustness interacts with benchmarking competency to influence quality management practices among SMEs in Uganda.*

Figure 1 depicts that SMEs that sufficiently plan and adopt the quality management standards of the best players in the industry are likely to control their operations processes and suppliers thereby providing value for money to their customers. Besides, an environment with useful and usable ICT infrastructure enhances benchmarking efforts in search for customer desired products. In effect, ICT enabled environs hasten the search for optimum quality practices with minimal efforts. **Figure 1:** Conceptual model depicting the relationship between benchmarking competency and quality management practices among SMEs in an ICT dominated environment. In view of literature, we develop a conceptual model in Figure 1 to guide this study.

**Figure 1: Conceptual Model**



Source: Theoretical and literature review

### **Methodology**

The study was guided by critical realism which takes into consideration positivism and interpretivism philosophical dimensions. The main reason why we adopted the mixed method approach is that scanty literature is available on benchmarking concept in the context of SMEs (Shrafat, 2018). Besides, Putnam and Banghart (2017) conceive that studies that use combined paradigms yield plausible results. The use of a single approach under conditions of limited literature would in a way compromise the authenticity of the findings. To achieve the above, the study used a cross-sectional research design given the dynamic nature of the concept; QMP. Both quantitative and qualitative measurements were adopted to improve the analytical space for inclusive results (Megel & Heermann, 1994). The study involved 851 firms in the central and eastern regions; representing 90% of the SME population in Uganda (UBOS, 2014). A sample of 275 firms was determined using (Krejcie & Morgan, 1970). However, after a rigorous process data editing, only 250 were found usable. The study used simple random sampling technique to select representative study samples from each region using *M/S* Excel random selector.

### **Operationalization and measurement of variables**

The variables; quality management practices, bench-marking competency and ICT robustness were operationalized in respect of previous works in related fields of study, this was done to improve the validity and reliability of the measurement tools. In addition, it was to reduce the variables into measurable attributes and respective indicators (Machery, 2007; Saunders, Lewis & Thornhill, 2012). For example, we define QMP based on its three dimensions that is; customer orientation which are efforts aimed at aligning organizational processes to create individualized customer value (Mentzer et al. 2001); process control which is; a systematic approach to regulate operations processes for consistent results (Sanders & Linderman, 2014) and supplier quality management which we define as a set of guidelines emphasized by purchasing organizations to achieve desired inputs (Foster, Wallin, & Ogden, 2011). We use measurement items from (Saxe & Weitz, 2010; Sadikoglu & Olcay, 2014) such as; “The

organization provides accurate information to customers. We also seek to establish whether products provided by organization deliver desired benefits to customers and whether the organization and its products empower customers in decision making.

We operationalize benchmarking competency as having two dimensions of planning and adoption. We define planning as determining operational goals and the preferred practices likely to produce optimal results (Albertin et al., 2015) and we measure it using measurement items such as; having knowledge of operations, the products, cross- functional teams, customer expectations, current performance, performance indicators and benchmarking budget. In addition, we define adoption as being able to determine operational goals and the preferred practices likely to produce optimal results (Albertin et al., 2015; Salem, 2013).

Finally, ICT robustness has two dimensions; usefulness and usability which we measure using measurement scales from Orinda (2015) and Davis et al. (1989) respectively. For usefulness, we use items as; “being able to accomplish tasks easily, doing work the right way, being able to improve work quality and productivity”. Usability is measured with items such as “easy to apply, understandable, friendly and flexible” based on Davis (1993). In assessing reliability of the measurement items, the items on Quality management practices produced a reliability of  $\alpha = 0.781$  and TVE = 62.17%., benchmarking competency produced a reliability of  $\alpha=0.79$  and a TVE = 63.16% while ICT robustness produced a reliability of  $\alpha = 0.916$  and TVE = 66.80% and they all met the acceptable cut-offs and were used for the study.

The quantitative data was collected using a six point Likert scale instrument designed to represent a fairly wide range of response choices. To accommodate a sizeable number of respondents, self-reported tools are more convenient since they are largely managed by the respondents themselves (Megel & Heermann, 1994). Whereas the unit of inquiry was an employee in the operations function, the unit of analysis was the firm. A complementary interview guide was used for purposes of collecting qualitative data from key informants selected purposively with regard to their operating environments (Saunders et al., 2015). The researchers share the view with interpretivists that reality is relative depending on the specific activities of individual social actors and can best be understood through in-depth interviews (Kelliher, 2005). The interviews lasted between 45 minutes and 1 hour depending the respective levels of engagement. We observe that use of the questionnaires and the interview guides are sufficient to capture wide ranging aspects of the study phenomena.

To control for the common methods bias associated with self-administered research studies, the researchers adopted temporal separation of the predictor and dependent variables. The study also adopted the exclusion of homogenous scales by introducing a mix of scales ranging from strongly disagree to strongly agree, absolutely untrue to absolutely true and completely disagree to completely agree. We further simplified the items to minimize ambiguity (Podsakoff et al., 2012). Instrument validity was analysed using convergent and discriminant aspects. Convergent validity was examined using the Bentler-Bonett Normed Fit Index (NFI) (Mak & Sockel, 2001) and the respective indices were within the recommended range of  $\geq 0.90$  as shown in Table 1:

**Table 1:** Convergent validity index for global variables

Variable	NFI
Quality management practices	.962
Benchmarking competency	.964
ICT robustness	.957

Discriminant validity was established using the construct square root of the average variances extracted; which according to Fornell and Larcker (1981) should be significantly greater than their corresponding correlation coefficients and that all the matrix correlations should be statistically significant. The recommended thresholds are demonstrated in Table 2.

**Table 2:** Discriminant validity

Con't	CO	PC	SQ	BP	AD	UB	UF
CO	<b>.709</b>						
PC	.41**	<b>.707</b>					
SQ	.38**	.53**	<b>.709</b>				
BP	.22**	.43**	.46**	<b>.791</b>			
AD	.23**	.47**	.49**	.37**	<b>.773</b>		
UB	.30**	.36**	.40**	.37**	.40**	<b>.811</b>	
UF	.40**	.44**	.42**	.35**	.38**	.55**	<b>.794</b>

\*\* Correlations are significant at the level of .01(2-tailed).

To ensure validity and reliability of qualitative data, the researchers maintained a rigorous process that involved data coding, transcription, revision, realignment of ideas and respondents' validation (Miles & Huberman, 1994). This was to ascertain credibility, authenticity, and accuracy of ideas emerging from interviews to guarantee dependability and replicability of the study findings (Elo et al., 2014). The reliability of qualitative data lies in the quality and objectivity of research design and analytical procedures undertaken (Noble & Smith, 2015). Based on primary data, the researchers went ahead to generate memoirs and carefully developed structured patterns of themes for meaningful analysis and interpretation (Miles & Huberman, 1994).

## Results

We present the descriptive statistics of the data in Table 3. Accordingly, the mean scores for the variables fall within the range of 4.89 and 5.27 on an anchor of a six point Likert scale. This suggests that on average, SMEs are satisfied with the QMP adopted and modified to deliver the required products by customers. Relatedly, the standard deviations range from .36 to .56. The statistic designates that standard deviation range is smaller than the mean values. Henceforth, the mean signifies the data (Field, 2009).

**Table 3:** Descriptive statistics

Variable	N	Min	Max	Mean	S.E	SD	Var
Quality management practices	250	3.94	6.00	5.27	.02	.36	.13
Benchmarking competency	250	3.32	6.00	4.89	.04	.56	.32
ICT robustness	250	3.21	6.00	5.22	.03	.49	.25

**Correlation analysis**

Pearson two tailed correlations test was performed to establish whether or not there exists an association between the predictor and the dependent variable in respect of the empirical literature and hypothesis 1. According to Hair et al. (2010), the association between direct hypothesis should be significant as a benchmark to execute higher order statistical examinations including regression analysis. Table 4 indicates that the association between the direct variables met the minimum requirements to qualify for further statistical examination. In effect, benchmarking competency and QMP are positively and significantly associated ( $r=.50, p<.01$ ). This signifies that changes in benchmarking competencies of a firm are associated with changes in QMP.

**Table 4:** Zero order correlation analysis results between benchmarking competency and quality management practices

n=250	Mean	Std. Dev	1	2
Quality management practices	5.267	.3573	1	
Benchmarking competency	4.889	.5619	.50**	1

\*\*Correlations are significant at .01 levels (2-tailed)

**Regression analysis of direct effects with control variables**

The study used hierarchical regression analysis in respect of guiding procedures of Petrocelli et al. (2003) where group categories are entered simultaneously. In the study, the researchers sought to establish the influence of control variables and the predictors on the outcome variable; QMP (Frazier et al., 2004). Table 5 presents the results of the analysis in respect of model 1 and 2. The model coefficients are used as indicators to test for the contribution of the independent variable on QMP. The variance ( $R^2$ ) explains the overall contribution of the predictor variable in the final model.

Model 1 takes into account control variables; location of firm by region, nature of business, approximate number of employees, years the organization has been in existence and the number of branches owned by a particular firm. Notably, all the control variables are not positively and significantly associated with the dependent variable; quality management practices ( $\beta= -.10; p >.05$ ); ( $\beta= -.12; p >.05$ ); ( $\beta= -.12; p >.05$ ); ( $\beta=-.02; p >.05$ ) and ( $\beta= -.02; p >.05$ ) for location of firm by region, nature of business, approximate number of employees, years the organization has been in existence and the number of branches owned by a particular firm respectively. This implies that the control variables did not influence the predictive power of the independent variable; benchmarking competency. The results henceforth depict the model accuracy.

Model 2 takes into account benchmarking competency variable. Results reveal that benchmarking competency positively and significantly predicts QMP among SMEs in Uganda ( $\beta= .48, p<.001$ ); which renders supplementary support to  $H_1$  stating that “there exists a positive and significant relationship between benchmarking competency and QMP among SMEs in Uganda”. Benchmarking competency makes a significant contribution of 22 percent of the variation in QMP ( $\Delta R^2=.22; p<.001$ ). The overall model is statistically significant ( $F= 15.56; p<.001$ ). In the final model, a unit change in benchmarking competency causes a change in QMP by .48 ( $\beta=.48$ ). Thus, of the total effect (28%), benchmarking competency explains 22% while

other factors not hypothesized in the model explain dismal 6% of the variation management practices.

**Table 5:** Hierarchical regression analysis results for control, predictors and dependent variables

Variable	Model 1		Model 2	
	B	$\beta$	B	$\beta$
(Constant)	5.30		5.34	
Location	-.08	-.10	-.05	-.12
Business	-.06	-.12	-.05	-.10
Employees	.11	.15	.09	.12
Y/Existence	-.00	-.01	-.00	-.02
Branches	-.02	-.06	-.01	-.02
BC			.31	.48***
$R^2$	.06		.28	
Adj. $R^2$	.04		.26	
$\Delta R^2$	.06*		.22***	
$\Delta F$	2.90		74.45	
$F$	2.90		15.56	
Sig	.01		.000	

\*\*\* $p < .001$  \* $p < .01$

**Regression analyses showing the interactive effects**

The interactive effect of ICT robustness on the relationship between benchmarking competency and QMP is presented. Results in Table 6 indicate that the beta coefficient of the interaction term was non-significant ( $\beta = -.06$ ;  $p > .05$ ). This implies that benchmarking competency does not interact with ICT robustness to influence quality management practices among SMEs in Uganda. Further, the researchers run a Mod-Graph statistic to confirm the results emerging from an interactive model as recommended by Jose (2013) and results are represented in Graph 1.

**Table 6:** Regression analysis results for the interactive effect of ICT robustness & benchmarking competency;

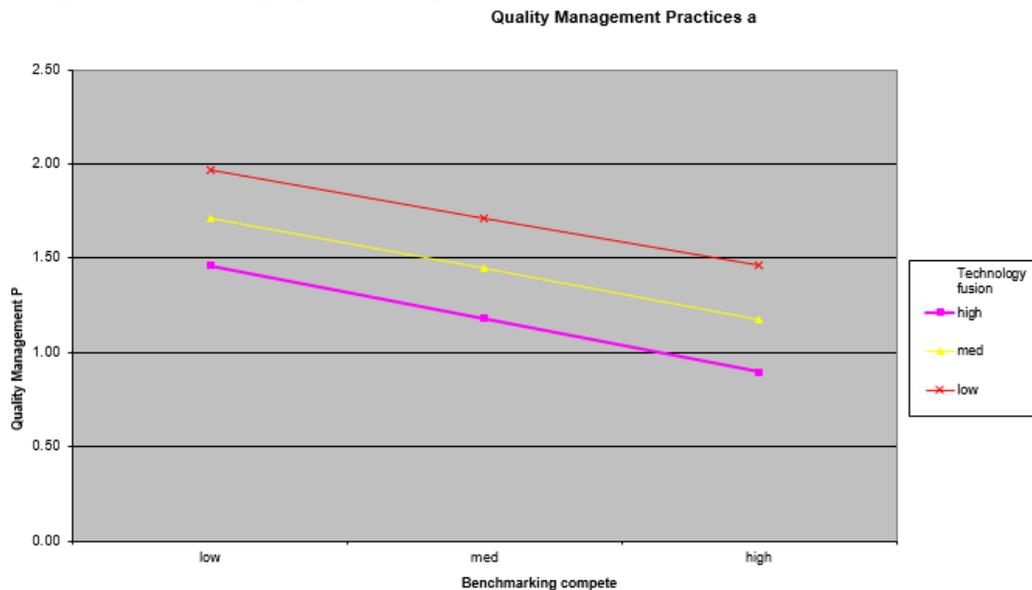
Variables	Model 1		Model 2		Model 3		VIF
	B	$\beta$	B	$\beta$	B	$\beta$	
(Constant)	5.27 ***		5.27***		5.27***		
BCC(M/E)	.39***	.50***	.20***	.32***	.21 ***	.32***	1.24
ICT (MOD)			.30***	.41***	.29***	.40***	1.32
Interac.term					-.05	-.06	1.07
$R^2$	.25		.39		.39		Na
Adjust. $R^2$	.25		.38		.38		Na
$\Delta R^2$			.14		.00		Na
$\Delta F$	82.77***		55.27***		1.24		Na
$F$	82.77		78.08		52.51		Na
Sig.	.00		.00		.00		Na

**n=250, Dependent variable; quality management practices**

\*\*\*  $p < .001$ , \*\* $p < .05$

In line with the results of the interactive model, the parallel simple lines imply non-existence of the interaction effect between benchmarking competency and ICT robustness on quality management practices among SMEs in Uganda. Hence,  $H_2$  which states that “The level of ICT robustness interacts with benchmarking competency to influence quality management practices among SMEs in Uganda” is not supported. The implication here is that ICT applications do not support benchmarking efforts to achieve desirable quality management practices. In a nutshell, acquisition, storage, retrieval and integration of up to date standards are not related to provision of product benefits, control of work processes and improved management of firm supplies under conditions of different levels of ICT robustness.

**Graph (1):** A mod-graph showing the interactive effect of ICT robustness



***The Qualitative Data Results***

The results that emerge from the qualitative study were presented and analyzed using a social reality model. The researchers identified the emerging themes and sub-themes arising from the criterion, predictor and the interactive variables which were analyzed using Nvivo version 10 and the results are demonstrated in a social reality model in Figure 1.

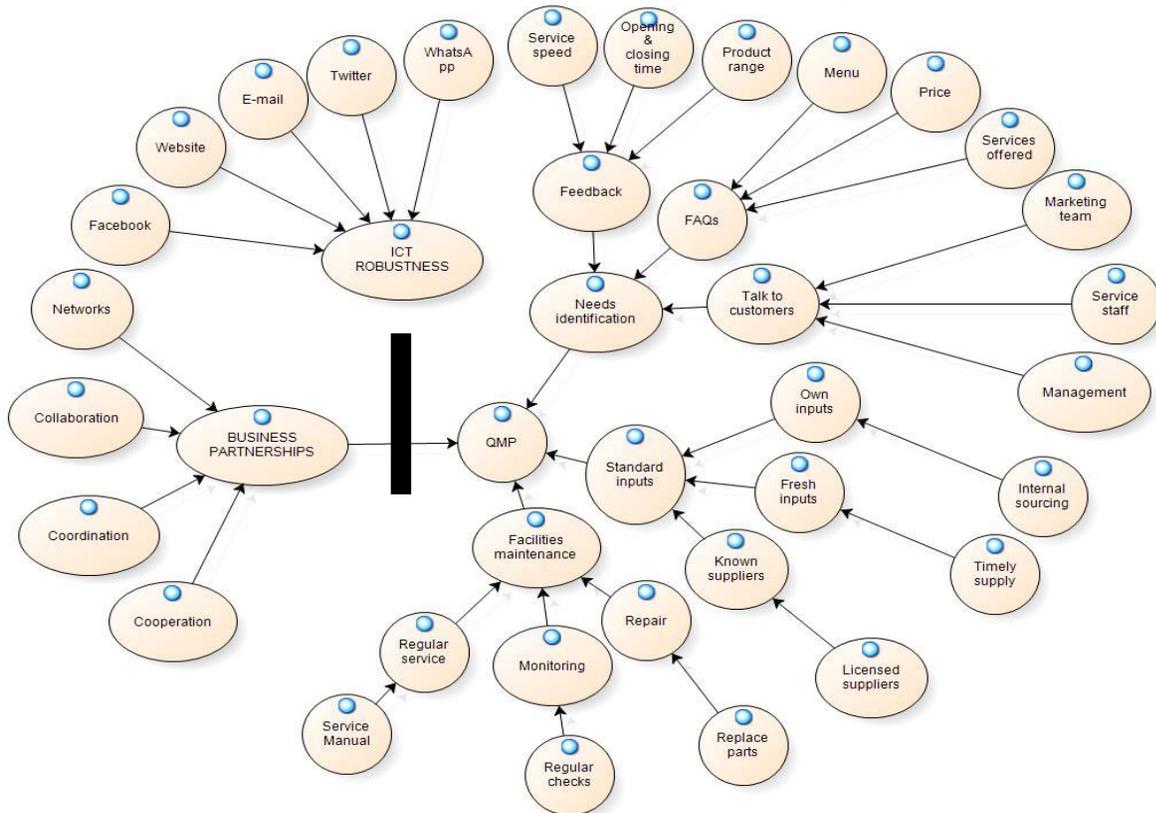
Social reality in Figure 1 portrays QMP in terms of needs identification, standard inputs and facilities maintenance. Accordingly; needs identification was understood to mean timely feedback from customers in terms of service speed, timing and product range offered by the organization. Besides, firms ascertain customer preferred products from FAQs which basically focus on the services offered, prices charged and the order menu. Lastly, firms also recognize customer essentials by talking to them through the front desk staff, marketing team and sometimes management. Additionally, one way to ensure effective QMP was by obtaining standard supply inputs from known or registered suppliers. The registered suppliers are those certified by quality regulators including the Uganda National Bureau of Standards and International Standards Organization (ISO). Further, standard inputs signify obtaining fresh inputs from suppliers in a timely manner and or owning inputs; popularly referred to as internal

sourcing. Additionally, facilities maintenance through monitoring, repair and regular service was associated with QMP.

Additionally, benchmarking competency was contextualized in terms of business partnerships. These were acknowledged as vital sources of information manifested through effective business networks, coordination, cooperation and collaboration with eternal stakeholders. Business networks promote the exchange of information and ideas among firms that share common interests. SMEs establish business networks for purposes of sharing information to achieve long term strategic objectives. In due process, firms compare respective activities so as to identify areas of collaborations between themselves. Inter-firm collaboration enables entities to work together in order to achieve the overall business purpose. Through bilateral cooperation, firms undertake contractual obligations on how to share common resources for mutual gains.

The most ICT preferred applications include Facebook, WhatsApp, websites, email and twitter. ICT applications are identified as key tools to facilitate firm outreach through effective communication. Fundamental activities conducted through ICT support include; promotions, advertising, online bookings, international market access, research and development, information sharing, exchange and storage. The impact the ICT applications have had on organizations include; quick access to markets, reduced operational costs, faster transactions, effective monitoring in price variations, real time decision marking and cost saving.

**Figure 2:** A reality model of factors associated with quality management practices among SMEs



Source: Primary data

### Discussion of the results

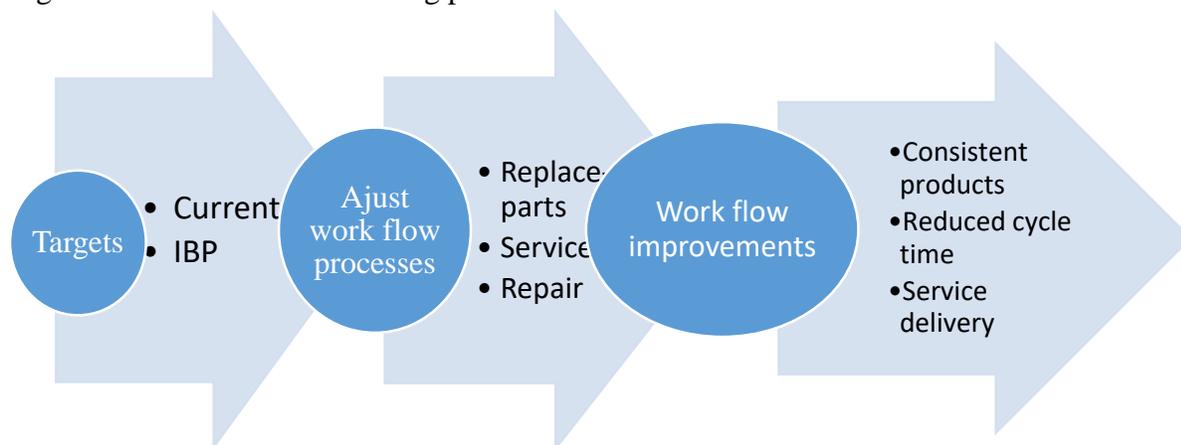
Conceptually, benchmarking competency is a continuous and systematic process of determining appropriate interventions for improvement premised on industry best practice. It was operationalized using two dimensions which include; benchmarking planning and adoption. The researchers sought to establish the relationship between benchmarking competency and quality management practices among SMEs in Uganda. The discussion was aligned with the stated hypotheses of the study. Hypothesis 1 states that:

*There exists a positive and significant relationship between benchmarking competency and quality management practices among SMEs in Uganda (Supported)*

The results in respect of H<sub>1</sub> designate that SMEs are capable of identifying and bridging firm performance needs based on industry distinctive practices to the satisfaction of the customers. Through networks with better performing firms; SMEs improve their work related activities by creating efficiencies and reducing waste along the value chain. By realigning internal processes with the superior systems in the industry, SMEs are capable of elevating their practices thereby controlling for regular process variations to achieve consistent quality products. Likewise, SMEs that carry out adjustments in work flow activities by replacing worn out parts, carrying out regular service and repair of machinery and equipment are more effective in meeting the preferred quality standards. The results emerging from quantitative data resonate well with quantitative results as depicted in the systems-upgrade process model in Figure 3.

In effect, successful benchmarking practice starts with comparison between the current levels of firm achievement against industry best practice (IBP). If a performance gap is identified, the firm makes efforts to adjust work flow processes focusing on the preferred methods by replacing worn-out parts with modern equipment, regular repair and service among other interventions. If the process is well envisaged, it results into consistent products, reduced cycle time and remarkable improvement in service delivery.

Figure 3: Effective benchmarking practice



Source: Primary data

The study findings reflect the empirical works of Naveed et al. (2017) who established a positive and significant relationship between systems improvement in manufacturing firms with respect of better performing firms. In a related study, Killa (2014) postulates that alignment of

internal processes with those of market leaders propels a firm's value creation and market performance. Comparable findings by Hsiao (2017) reveal that networking relationships; which are components of benchmarking effort; are positively related to improvements in service innovations. Consistent findings by Ajelabi and Tang (2010) posit that adjusting work flow activities based on industry good practice improves systems productivity and efficiency. Therefore, successful systems upgrade based on benchmarked data requires human resources to unlearn the existing status quo in order to appreciate the new system which comes along with major adjustments (Wahab & Rahim, 2013).

Further, empirical works by Matinichi (2014) depicts that SMEs that successfully embrace industry best practice premised on proper planning within their operations deliver customer value. Further, similar findings reveal that SMEs need to monitor and evaluate the current performance levels as a requirement to redirect firm operations thereby improving value for money derived by customers (Cusmano et al., 2018). Likewise, performance measurement based on monitoring and evaluation on continuous basis enables SMEs to seek solutions needed to overcome operational challenges to achieve desired firm objectives (European Commission, 2014). Hence, proper upgrade of system needs results into right products that meet customer expectations (Liebhart & Lorenzo, 2014).

Contrary to the above findings, Wahab and Rahim (2013) note that without full management support, benchmarking effort is likely to collapse because the activity is of strategic nature. In the above view, Lakhal, Pasin and Limam (2006) established that improvements in work related practices did not have a significant direct effect on operational performance in the cosmetics industry. Nevertheless, our study focused on SMEs whose operating systems are perceived more flexible and dynamic compared to the more static large scale (cosmetics) industries with bulky machinery and equipment. Hence, the study findings are in consonance with the Continuous Improvement theory by Kaizen (1986) which emphasizes the need to understudy external best practices to improve internal operations systems to the satisfaction of the customers.

Hypothesis 2 states that:

*The level of ICT robustness interacts with benchmarking competency to influence quality management practices among SMEs in Uganda (Not supported).*

ICT robustness was hypothesized as the flexibility with which a firm embraces modern internet applications that drive business practices (Wahab et al., 2011). Successful integration of ICT applications is dependent upon the degree of usefulness, usability and its transferability from one generation to another (Davis, Baggozi & Waarshaw, 1989). ICT applications are regarded as useful if a given action is expected to ease job related tasks. ICT usability is an operational decision that supports innovation as an optimal course of action (Everett, 1995). Quantitative results indicate that differences in levels of ICT robustness including WhatsApp, twitter and Facebook do not support SME endeavours to upgrade their work flow activities based on industry best practice to satisfy customer needs. Consequently, effective modifications in operations necessitate close collaboration and coordination between parties to enable team members synchronize the needed interventions to cause long term improvements in operations. SME management apparently perceive that adopting best practices for possible re-modification

to improve work flow systems is strategic in nature and requires direct interaction among groups involved.

Qualitative results mirror the findings as expressed in *vignette 1*; *Most SME operations managers and quality controllers acknowledge the influence of ICT support in enhancing external networks. However, they note that the operating environment is constrained by frequent network failure, absence of a clear regulatory framework, insufficient government support and high maintenance costs. These factors among others impede effective working relationships with external stakeholders; stifling online activities to support internal restructuring.*

In line with the above results, Setiowati et al., (2015) indicate that market turbulences do not support SME adoption of ICT applications based innovativeness to gain access to markets due to resource constraints. In a related development, lack of infrastructural facilities, poor telecommunications set-up, absence of regulatory framework, inadequate government support inadequate skills and rising costs of ICT equipment (Misra et al., 2018 & Afolayan et al., 2015) are common external barriers hindering adoption and usage of ICT systems among SMEs especially in developing countries.

However, Musabila (2012) posits that the relative benefits of ICT innovation are positively related to its usability among compliant SMEs. Relatedly, Setiowati et al. (2015) designate that a robust regulatory policy and supportive operating environment influence SME access in less saturated market places. Additionally, access to formal/informal training is critical in improving SMEs' competency in ICT applications needed to support externally induced innovations. In the foregoing, it is probable that the failure of ICT applications to spur system upgrade activities among SMEs in low income countries could be explained by inadequate employee training, non-vibrant regulatory frameworks and frequent network failure that impede successful inter-firm collaborations.

### **Conclusions and implications**

Emerging discussions suggest that efforts to adopt and modify internal systems of a firm based on better performing entities in the industry augment the ability of SMEs to deliver quality products anticipated by the current and prospective customers. Likewise, systems adjustments support firm control mechanisms to provide consistent products in the long run. However, different levels of ICT robustness do not enhance benchmarking efforts to achieve quality products. Nevertheless, the social actor's perspective is that a robust ICT system would enable SMEs to achieve the much needed information from external sources to reinforce their operations with reliable communication network, efficient equipment and government support in form of subsidies.

### ***Theoretical implications***

The study was anchored on the theory of Continuous Improvement (Kaizen, 1986) which advocates for stakeholder involvement in quality management endeavors. This suggests that;

- i. Having clear knowledge of customers' interests enhances the ability of SMEs to identify the correct interventions to bridge performance gap in operations.
- ii. Adoption of industry best practice as part of quality management effort is critical where an organization in a way constrained by operational resources.

### **Managerial implications**

The study suggests that;

- i. Operations managers and quality controllers should endeavour to adopt and modify industry best practice to remain relevant by providing standard products fit for consumption
- ii. SME managers should establish business networks with those firms perceived better if they (SMEs) are to offer desired quality products to the more informed customers.
- iii. Through alliances, SME management should collectively lobby with government to improve ICT infrastructure and establish a supportive regulatory policy to enhance inter-firm networking, coordination, cooperation and collaboration for sustainable operations.

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