

# The Influence of Tacit knowledge on Competitive Advantage: Learning from ICT Service Providers in Nairobi

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## ABSTRACT

The strategic management scholarly landscape is replete with conceptual literature on resource- and knowledge-based theories that single out tacit knowledge as an important driver of competitive advantage. This is not matched by empirical studies that have explicitly tested these ideas. This study contributes towards filling this gap. The study followed positivist and post-positivist critical realism philosophical orientations, using a cross-sectional survey design approach. The population for the study was the ICT content service providers licensed by the Communications Authority of Kenya (CAK). Out of the target population of 197 ICT content service providers, 135 firms provided valid responses to the survey. The study affirmed the importance of tacit knowledge as a resource that contributes to the competitiveness of a firm relative to its peers. This is an additional building block in strategic management theories that show the importance of continuous enhancement of the productive knowledge of individuals in an organization in increasing the competitiveness of the organization.

**Key Words:** Knowledge Based View, Resource Based View

## INTRODUCTION

In the 1970's many strategic management scholars used an outside-in approach in analyzing the factors responsible for the competitiveness of a firm in a particular industry. Porter's 5-forces model was particularly appealing in articulating this perspective (Porter, 1979). He postulated that position of a firm in a competitive industry is determined by the power to bargain that is possessed by both customers and suppliers, the threat posed by substitute products, and the fear of newcomers joining the industry; as well as competition amongst the existing industry players. In later years, strategic management theories based on an inside out approach started gaining prominence notably, the Resource Based View (RBV) the origin of which is attributed to Wernerfelt (1984), Barney (1991), and Conner (1991). This theory postulated that a firm's competitiveness was largely attributable to its resource endowments. Further, that the magnitude of the competitive advantage was determined by the value of those resources, their rarity, their immutability and their un-substitutability (VRIN) (Awino, 2013; Awino, Muchara, Ogutu & Oeba, 2012).

The development of RBV was the foundation of the Knowledge Based View (KBV), which highlighted knowledge as an important strategic intangible resource and a key driver of

competitive advantage (Kogut and Zander, 1992). A further refinement of this theory classified knowledge into either explicit or tacit. Explicit knowledge is the type of knowledge that is already codified in manuals, books, and other forms; whilst tacit knowledge is the subtle uncodified knowledge that resides in peoples' minds, is difficult to express, but significantly shapes their behavior (Campbell & Armstrong, 2013; Guyo, 2012; Kamukama, 2013; Kogut and Zander, 1992).

Whilst the importance of tacit knowledge in particular has been clearly acknowledged in the literature, empirical studies to test this have been very few. This knowledge gap motivated the current study. The research domain was the largely knowledge-driven and rapidly growing ICT sector in Kenya.

Tacit and explicit knowledge exist on the same spectrum and complement each other (Holden & Glisby, 2010; Nishihara, Matsunaga, Nonaka, & Yokomichi, 2018; Polanyi, 1984). Tacit knowledge, is grounded in experience, expertise and individual insights. It is not codified; if it is codified, then it loses its tacit nature and becomes explicit knowledge (Cheruiyot, Jagongo & Owino, 2012; Nishihara, et al., 2018; Nonaka, 1994). Tacit knowledge tends to be implicit and underemphasized considering its importance for success in practical situations. Individuals find it difficult to explain how they acquired it and this is what gives it a tacit quality (Tschetter & Tschetter, 2010).

Competitive advantage is the unique position enjoyed by a firm relative to its competitors. It is an attribute or combination of attributes such as a physical resource or an intangible resource that enables an organization to perform better than its rivals. Sustainable competitive advantage depends largely on the positioning of a firm within an industry and the firm's ability to stave off competition from existing and new players in the industry, substitute products or services, and the capability to effectively counter the power wielded by customers and suppliers (Porter, 2008).

The resource-based view (RBV) which has its roots in evolutionary economics theory, uses an "inside-out" approach in analyzing competitive advantage. The firm is considered to be a bundle of resources and competitiveness is sustained by nurturing opportunities inherent in the internally endowed resources. Unlike in the Porter (2008) model where the industry takes center stage, in RBV the firm is the central unit of analysis.

The aim of ICT is to connect computers and related devices to gather, process, classify, manage, create, and distribute information. The dynamics in the ICT industry are changing rapidly as new content service providers offer innovative business solutions based on new technological innovations such as cloud computing. Consumers are expecting fast, "always-on" access to high quality content from anywhere in the world. Because of this, the role of content service providers has become increasingly important in the ICT ecosystem (Acker, Gröne, & Schröder, 2012).

The ICT sector in Kenya is its nascent stages. It is currently experiencing rapid growth with different service providers jostling for space in a highly competitive business environment. The Kenya government recognizes ICT as a critical tool for expanding human skills through production, distribution and utilization of information and knowledge. Accordingly, the government plans to take deliberate steps to enhance ICT knowledge and skills that will be necessary for better performance of organizations. (Communications Authority of Kenya, 2015). The ICT ecosystem in Kenya as a whole accounted for KShs 66 billion or 1.2% of the

country's GDP in 2015. ICT content service providers in Kenya include internet service providers, payphone service providers, and data operators; call center service providers, paging service providers; and radio stations, television stations, and courier operators. ICT content service provider licensees comprised 26% of the ICT sector in Kenya, 95% of whom were based in Nairobi (Communications Authority of Kenya, 2015).

### **MATERIALS**

The key strategic management theories that underlie the current study are the RBV and KBV. Competitive advantage is a relative concept that is built into these theories. It is the relative superiority of a firm compared to its peer group in an industry (Nonaka & Krogh, 2009; Raduan, Jegak, Haslinda & Alimin, 2009; Teece, Pisano & Shuen, 1997). RBV stems from the idea that that competitive advantage for a firm is derived from the unique internal resources that the firm possesses rather than the firm's positioning in the external environment. The firm is seen as made up of resources and capabilities. The firm can use these resources and capabilities to its advantage depending upon their value, rarity, inimitability, and unstitutability (VRIN) (Acquaah, 2012; Wernerfelt, 1984).

KBV is an extension of RBV (Curado & Bontis, 2006; Low & Ho, 2015). KBV postulates that knowledge is a special resource that is at the heart of a firm. Knowledge is heterogeneous, cannot be easily imitated by others outside the firm and is therefore a source of competitive advantage. Further, because tacit knowledge is complex and inimitable, it can create competitive advantage (Cheruiyot, Jagongo & Owino, 2012; Curado & Bontis, 2006; Low & Ho, 2015; Nonaka & Krogh, 2009; Polanyi, 1984).

Kogut & Zander (1992) strongly articulated the dynamic process through which firms create knowledge, and the importance of tacit knowledge in creating a firm's competitiveness and growth. The extensively cited theoretical contribution of Kogut & Zander is particularly appealing in the context of the current study. A Google search conducted on April 9, 2018 showed that Kogut & Zander (1992) had been cited in more than 14,000 related articles.

In a study covering two information technology and business administration colleges in Malaysia, Rashid, Hassan and Al-Okaily (2015) determined that tacit knowledge development spurred competitive advantage for the institutions. Further, that because of weaknesses in measuring and tracking tacit knowledge factors, UNITEN had missed out on the opportunity to use the available tacit knowledge resources to enhance its competitiveness. In another empirical study conducted by Jackson (2012) in the USA, the results of Pearson correlations showed a significant statistical correlation between tacit knowledge and the selling level, confirming the hypothesis that tacit knowledge embedded in customer relationships and product knowledge helps drive the performance of sales teams which in turn increases the competitiveness of a firm.

There have not been any local Kenyan studies conducted that focus specifically on the relationship between tacit knowledge and competitive advantage. However, considering that tacit knowledge is manifested through the talent possessed and demonstrated by individuals, the study by Kireru, Karanja, and Namusonge (2017) is noteworthy. The results of the study showed that the talent acquisition process was a determinant of competitive advantage. Further, that the telecommunications firms that were the subject of study invested their resources to attract the right talent. A one unit change in talent acquisition process led to 13.6% change in competitive advantage in these firms.

## METHODS AND RESULTS

The philosophical orientation of the current was positivist and post-positivist critical realism philosophical, and used a cross-sectional survey design approach. The study targeted the complete set of 197 content service providers based in Nairobi licensed by the Communications Authority of Kenya (2015). This content service providers' market segment was seen as a fertile ground for ICT knowledge creation and dissemination. Also, firms in this sector are relatively homogeneous which facilitated objective inter-firm comparisons of the study results.

Data was solicited from three managers from each of the firms under study. Valid feedback was received from 135 firms representing a response rate of 69%. This was close to response rates of several strategic management studies conducted in Kenya previously.

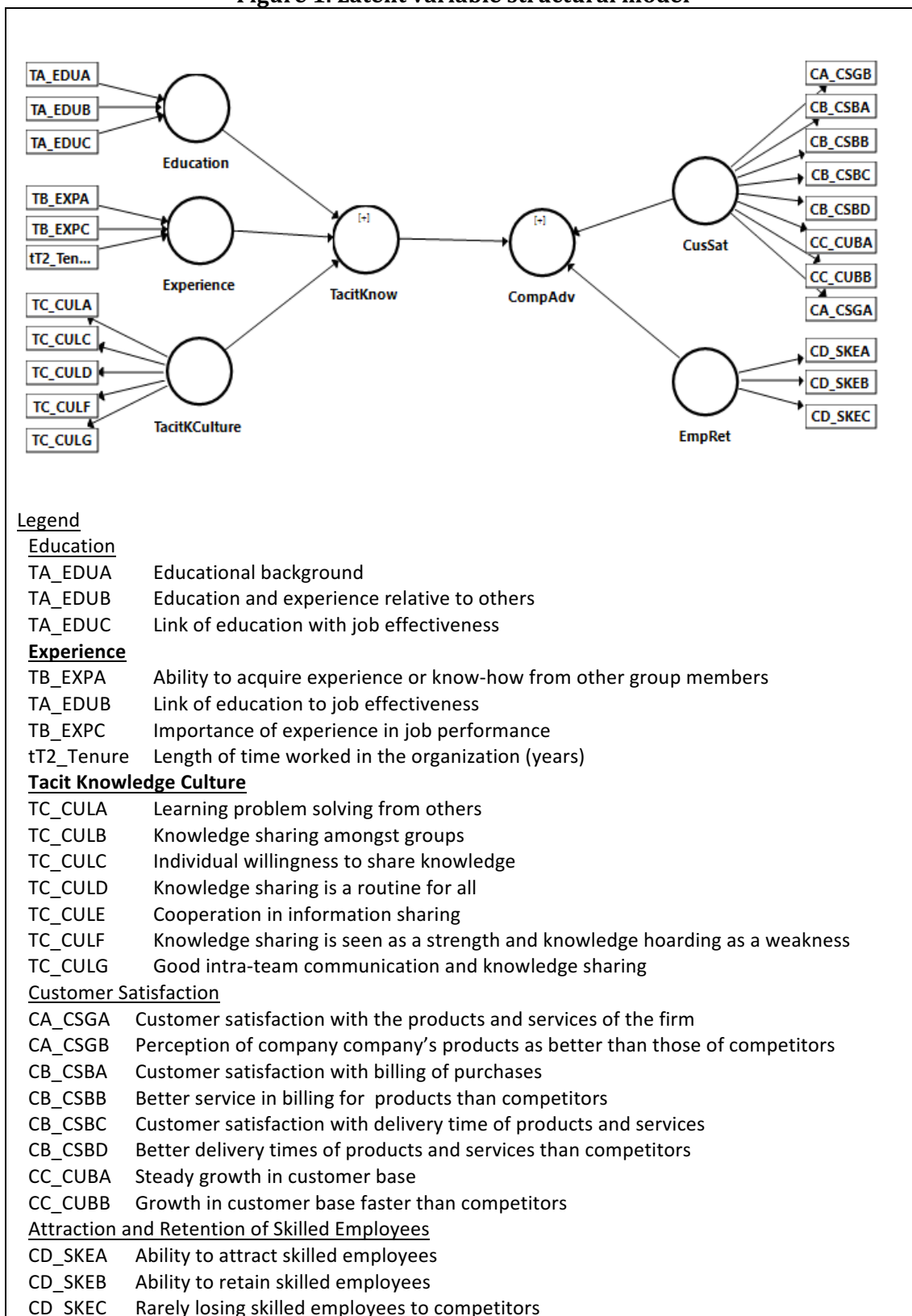
The research hypotheses were as follows:

**H<sub>01</sub>:** Tacit knowledge has no direct effect on competitive advantage

**H<sub>1</sub>:** Tacit knowledge has a direct effect on competitive advantage

Figure 1 shows the structural model that was created in SmartPLS based on a set of factors and latent variables after an exploratory and confirmatory factor analysis. Competitive advantage and tacit knowledge constructs are shown, along with their respective first order constructs. The measurement indicators of the first order constructs are also reflected.

**Figure 1. Latent variable structural model**



**Source: Primary research data, 2018**

A bootstrapping procedure using the PLS bootstrapping algorithm with 5,000 sub-samples was run to test whether the factor loadings for the reflective indicators and the weights for the formative indicators were significant. Key statistics of the model were generated (Table 1). The t-statistics for the loadings and weights for the study constructs were all above the 1.96 threshold (2-tailed). The p-values were all significant too at the  $\alpha = .05$  level. The SRMR ratio

for the estimated model was .13 which was below the .80 threshold, indicating that the model had a good fit (Kenny, 2015).

Four out of the five latent variables with reflective indicators had average factor loadings above the recommended .7 threshold (Hair, et al., 2010). The average loading for “attraction and retention of skilled employees” was .819, the one for information systems was .710, and the one for external network building practices was .759. The average loading for “customer satisfaction” was .689, and the one for “tacit knowledge culture” was .627. The average loadings for these two constructs, although below .70, were statistically significant based on the sample size of 135; and were significantly above the .50 threshold for practical significance (Hair, et al., 2010).

**Table 1. T-Statistics and P-Values of Model Factor Loadings and Weights**

Factor loadings and weights	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics ( O/STDEV )	P values
<b>Factor Loadings:</b>					
<u>Competitive Advantage</u>					
CA_CSGA <- CusSat	.787	.784	.038	20.875	.000
CA_CSGB <- CusSat	.688	.688	.049	13.991	.000
CB_CSBA <- CusSat	.756	.755	.040	18.742	.000
CB_CSBB <- CusSat	.598	.595	.066	9.048	.000
CB_CSBC <- CusSat	.616	.615	.060	10.314	.000
CB_CSBD <- CusSat	.674	.676	.045	15.067	.000
CC_CUBA <- CusSat	.733	.732	.044	16.796	.000
CC_CUBB <- CusSat	.658	.658	.051	13.020	.000
CD_SKEA <- EmpRet	.837	.837	.032	26.537	.000
CD_SKEB <- EmpRet	.851	.850	.032	26.448	.000
CD_SKEC <- EmpRet	.770	.767	.056	13.835	.000
<u>Tacit Knowledge</u>					
TC_CULA <- TacitKnowCulture	.697	.699	.058	11.969	.000
TC_CULC <- TacitKnowCulture	.644	.639	.067	9.586	.000
TC_CULD <- TacitKnowCulture	.556	.548	.092	6.032	.000
TC_CULF <- TacitKnowCulture	.625	.620	.078	8.033	.000
TC_CULG <- TacitKnowCulture	.615	.613	.077	7.993	.000
tT2_Tenure <- TacitKnow	.433	.430	.100	4.330	.000
tT2_Tenure -> Experience	.500	.494	.108	4.619	.000
<b>Weights:</b>					
<u>Tacit Knowledge</u>					
TA_EDUA -> Education	.668	.640	.154	4.336	.000
TA_EDUB -> Education	.383	.362	.175	2.189	.029
TA_EDUC -> Education	.479	.470	.188	2.550	.011
TB_EXPA -> Experience	.649	.644	.065	9.970	.000
TB_EXPC -> Experience	.422	.422	.076	5.557	.000

**Source: Primary research data, 2018**

Data for the first and second order constructs was downloaded from SmartPLS and used in SPSS to perform a regression analysis of tacit knowledge (TKW) on competitive advantage (CAD). Table 2 shows the regression of tacit knowledge indicators on the overall competitive advantage construct. The R<sup>2</sup> was .409 which meant that tacit knowledge explained 40.9% of

overall competitive advantage, with the remaining 59.1% attributable to other factors not covered by the study.

**Table 2. Regression of Tacit Knowledge on Competitive Advantage (Main Model)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.640 <sup>a</sup>	.409	.396	.780308

Note. Predictors: (Constant), TacitKnowCulture, Education, Experience

Source: Primary research data, 2018

The p-value of the model was .000 as shown in the Analysis of Variance (ANOVA) (Table 3), which was below the .5 threshold. Accordingly, the null hypothesis was rejected and the alternative hypothesis that tacit knowledge has a direct effect on competitive advantage accepted.

**Table 3. Analysis of Variance of Tacit Knowledge on Competitive Advantage**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.228	3	18.409	30.235	.000 <sup>b</sup>
	Residual	79.763	131	0.609		
Total		134.991	134			

Note. Dependent Variable: CompAdv. Predictors: (Constant), TacitKnowCulture, Education, Experience

Source: Primary research data, 2018

The standardized beta coefficients for individual indicators of tacit knowledge regressed against the overall competitive advantage construct are shown in Table 4. The standardized beta coefficient for “experience” was .480, and the one for “tacit knowledge culture” was .195, both of which were positive with values p values of .000 and .038 respectively, below the .05 statistical significance level. The corresponding t-statistics for these relationships were 5.242 and 2.095 respectively, above the desired minimum threshold of 1.96 (2-tailed). This meant that a one unit change in “experience” caused a .480 increase in competitive advantage; whilst a one-unit increase in “tacit knowledge culture” resulted in a .195 increase in competitive advantage.

**Table 4. Coefficients of Tacit Knowledge on Competitive Advantage**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.656E-5	.067		0.000	1.000
	Education	.027	.074	.027	0.359	.720
	Experience	.480	.092	.480	5.242	.000
	TacitKnowCulture	.195	.093	.195	2.095	.038

Note. Dependent Variable: CompAdv

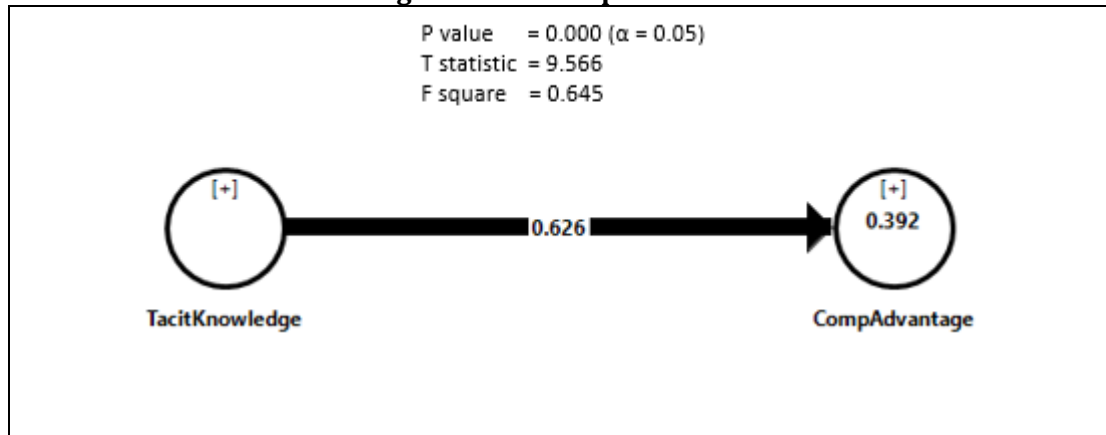
Source: Primary research data, 2018

The standardized beta coefficient for education, on the other hand, was negative .027, and statistically insignificant (p-value of .720 > .05 threshold for statistical significance). The t-statistic was .359, which was below the desired level of 1.96 (2-tailed) for statistical significance. This meant that “education” did not have any meaningful impact on competitive advantage. The metrics in Table 10 were represented by the following equation:

$$\text{CompetitiveAdvantage} = 1.656 + .480 \text{ Experience} + .195 \text{ TacitKnowledgeCulture}$$

The influence of tacit knowledge on competitive advantage, was also tested holistically using the SmartPLS two-stage approach (Ringle, et al., 2015). As a first step, indicators of the first order construct were used to generate factor scores for the second order constructs namely, tacit knowledge and competitive advantage. Secondly, the factor scores were used as indicators of the second order constructs which were then used to run the PLS algorithm and bootstrapping. A bootstrapping procedure using the PLS bootstrapping algorithm was run using 5,000 sub-samples. The path model and the key ratios generated are shown in Figure 2.

**Figure 3. Overall path model**



Source: Primary research data, 2018

Table 5 shows details of the pertinent statistical indicators from SmartPLS. The Heterotrait-Monotrait Ratio (HTMT) was .626 (p-value = .000; t-statistic = 9.588), indicating that there was significant discriminant validity between the two constructs. A HTMT ratio of .9 or below suggests that discriminant validity has been established (Henseler, Ringle, and Sarstedt, 2015).

**Table 5. Key Statistical Indicators from Smart PLS of TKW/CAD Model**

Key Indicator	Path Model		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Path Coefficients	TKW	->	.626	.625	.065	9.566	.000
	CAD						
f-square	TKW	->	.645	.681	.233	2.773	.006
	CAD						
HTMT Ratio	TKW	->	.626	.625	.065	9.588	.000
	CAD						
R Square	CAD		.392	.394	.080	4.873	.000
R Square Adjusted	CAD		.388	.390	.081	4.780	.000

Note. TKW = Tacit Knowledge; CAD = Competitive Advantage; HTMT = Heterotrait-Monotrait Ratio.

Source: Primary research data, 2018

The results from SmartPLS also showed that the standardized regression weight of the path from tacit knowledge to competitive advantage was .626 (p-value = .000; t-statistic = 9.566) which was statistically significant. The f-square statistic, on the other hand, which measures the effect size of the regression coefficient, was .645 (p-value = .006; t-statistic = 2.773), which was within the threshold recommended by Gaskin (2016). According to Gaskin (2016), an f-statistic of .15 and above is considered good, whilst .1 and lower is considered a low effect. The R<sup>2</sup> was .392 (marginally below the .409 obtained from SPSS) which indicated that tacit



knowledge explained 39.2% of overall competitive advantage, with the remaining 60.8% explained by other factors not covered by the study.

Based on these results, the null hypothesis ( $H_{01}$ ) was rejected and the alternative hypothesis ( $H_1$ ), that tacit knowledge has a direct positive influence on competitive advantage accepted. In other words, there was evidence to show that tacit knowledge possessed by individuals in the 135 ICT content service providers covered by the study impacted competitive advantage positively.

### CONCLUSION

The research findings supported prior empirical studies on the positive relationship between tacit knowledge and competitive advantage. This was additional empirical evidence, from a commercial setting and in a local Kenyan context. It also has parallels with the work of Jackson (2012) who showed that tacit knowledge embedded in customer relationships and product knowledge helps drive the performance of sales teams which in turn increases the competitiveness of a firm. It is noteworthy that although largely aligned with the study by Kireru, Karanja, and Namusonge (2017) that showed the importance of the talent acquisition process as a driver of competitive advantage, the results of the current study did not reveal any strong link between tacit knowledge and attraction and retention of skilled employees.

The research findings confirmed some of the pertinent ideas underlying theory on which the study was anchored namely, Knowledge Based View (KBV). The findings re-affirmed the idea that tacit knowledge is an important intangible resource that enhances competitive advantage of a firm, as previously articulated by various scholars (Acquaah, 2012; Awino, 2013; Campbell & Armstrong, 2013; Cheruiyot, Jagongo & Awino, 2012; Guyo, 2012; Holden & Glisby, 2010; Jackson, 2012; Nzuve & Omolo, 2012; Nonaka & Krogh, 2009; Polanyi, 1984).

### IMPLICATIONS OF THE STUDY

The study offers insights that help to fill various conceptual, contextual and methodological gaps. It affirms previous conceptual and empirical studies that showed the importance of tacit knowledge, a central tenet of KBV, as an important source of competitive advantage; with evidence from a local Kenyan commercial setting. The study is an additional building block in theories that recognize the continuous enhancement of the productive knowledge of individuals through continuous learning and on-the-job experience, with the attendant creation of sustainable competitive advantage as articulated by Kogut and Zander (1995) and Castro, Lopez-Saez and Delgado-Verde (2011).

From a contextual perspective, the current study offers fresh insights on the relevance of prior RBV theories related to tacit knowledge and competitive advantage. A number of similar studies conducted in the past focused on sports teams (Berman, Down & Hill, 2002), educational institutions (Rashid, Hassan & Al-Okaily, 2015), and state corporations (Guyo, 2012). The current study offers fresh insights in terms of competitive advantage as a driver of competitive advantage in a commercial setting. Many of the previous studies on the interplay of tacit knowledge and competitive advantage were conducted in the USA (Berman, Down & Hill, 2002; Holden & Glisby, 2010; Jackson, 2012; Tschetter & Tschetter, 2010). The current study, although not exactly mirroring earlier local studies in terms of terms of the set of study variables, is an additional building block in strategic management theory in the local Kenyan context, supplementing other closely related strategic management studies (Ambula, 2015; Awino, 2013; Cheruiyot, Jagongo and Owino, 2012; Namada, 2013; Ndegwa, 2015).

The study also demonstrates the power of structural equation modeling techniques that can be

used to supplement other first generation techniques such as linear regression in studying the relationship between latent variables. The relatively more powerful analytical power of structural equation modeling techniques in handling latent constructs is well articulated by Hair, et al., (2010). Additionally, whilst finding robust measures of tacit knowledge will continue to be a challenge in strategic management research, and other related social sciences (Guyo, 2012; Insch, et al., 2008; Rashid, Hassan & Al-Okaily, 2015), the current study is a useful addition in filling this methodological gap.

The study will motivate policy makers, primarily in the ICT sector, to develop policies that leverage the strong influence of tacit knowledge on competitive advantage. This will necessitate putting more emphasis on the experience and skills of individual organizational members in driving business performance, and nurturing a continuous learning culture in their respective organizations.

Future KBT and RBV research will need to take into account the disruption that is currently being driven by technological changes that challenge the underlying value, rarity, inimitability, and non-substitutable (VRIN) assumptions of RBV theory. For example, big data technology, cloud computing, the Internet of Things, and crowdsourcing, all of which are powerful drivers of competitive advantage, but some of which heavily reliant on external sources of information (Gupta, et al., 2018).

The data for the current study was gathered using a self-administered research instrument that respondents were required to fill in manually. The follow up of these questionnaires was a time consuming exercise. With hindsight, an electronic survey via email would probably have been less onerous to administer.

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