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## MARKETING | RESEARCH ARTICLE

# Deficit of digital orientation among service-based firms in an emerging economy: a resource-based view

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**Abstract:** Digital technologies are essential tools that Service-based firms can integrate into their business to transform their operations. However, in the emerging countries' perspective, research on the application of digital orientation among Service-based firms is less researched. This poses questions to scholars why the adoption of digital orientation is quite low among developing economies. The



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Michael Amponsah Odei research focuses broadly on the areas of strategy, innovation, and entrepreneurship. First, I am interested in how firms can access knowledge from their environment, for instance, from universities, customers, and competitors, to acquire new ideas to create successful innovations.

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### PUBLIC INTEREST STATEMENT

It is worth noting that digitalization (i.e., digital information and communication technologies) is empowering firms to employ and integrate e-business models. Many expect that the implementation of new means of business operation, especially using the Internet to promote sustainable business practices, will facilitate the access of these firms in emerging and developing countries to global markets. However, within the purview of developing countries, digital technologies and integration are under-utilized, hence, experiencing limited coverage of technological innovation. In this light, the current research aimed at exploring the factors constraining full digital orientation among firms in these countries. This study will admonish service-based firms in low penetrated digital adoption in building capabilities of digital orientation while encouraging ICT investment that enables firms to absorb the new technological systems that must be in place.

purpose of this article is to examine the impediments to digital orientation among Service-based firms in emerging and developing countries. Inspired by a resource-based view, a survey using a structured questionnaire was administered to 466 respondents (management and employees) of Service-based firms via a convenience sampling method in Ghana. Findings revealed that the knowledge gap, cost burden, and upgrading of technology positively and significantly create the gap in digital orientation among Service-based firms. The authors admonished that Service-based firms should 'be orient' on the use of digital technologies through appropriate training programs to enhance its adoption. The study again recommends practitioners of Service-based firms cultivate the habit of investing in human and technical capacities to optimize the benefits of the evolution of digital technologies. Limitations and future research directions are discussed.

**Subjects:** management of IT; information & communication technology (ICT); technology; business, management and accounting; information technology

**Keywords:** digital orientation; transformation; digitalisation; service-based firms; Ghana

## 1. Introduction

Digital technologies have transformed how Service-based firms interact and exchange product knowledge and information over the years. For instance, web 2.0 has changed how employees access information and communicate with each other during the course of business transactions with their external counterparts (Lamberton & Stephen, 2016). The Internet of Things (IoT) is fast revolutionizing how consumers interact with manufacturers (Echterhoff, 2013). While the impact of technological advancements has affected how every activity and task a person does daily is carried out, it has had major transformations in how businesses are conducted across the globe (Osakwe & Ikhide, 2022; Wright et al., 2016). Undoubtedly, the performance of service-based firms in the such digitalized environment is not under contention since digital technology supports intelligence and reduces operating businesses' costs (Harrigan et al., 2012). However, Service-based firms in developing countries are struggling to catch up with the advanced world in digital orientation because of inadequate technical know-how (or expertise) to adapt to the changing trend of the global market (Prasanna et al., 2019).

To ensure sustainable marketing and management practices among firms, they (firms) need to adopt behaviors that would help them to fit in the global business environment and would aid in asset acquisition while investing in human capital (Odei & Stejskal, 2018). It is imperative to note that firms investing in knowledge are directed by the organizations' strategic orientation which helps them to meet their objectives (Odei et al., 2021). Despite the continuing interest and ongoing investments in digital orientation systems for the facilitation of business development efforts, evidence on organizational-level factors that influence users' resistance to these systems has rarely been explored (Jibril et al., 2020; Kwarteng et al., 2020). In other words, while empirical evidence of the gains attained from digital evolution has been unprecedented, questions related to factors impeding digital orientation among service-based firms, particularly in emerging and developing economies remain unanswered. Hence, this study seeks to explore how Service-based firms are constrained with full integration of digital orientation given the evolution of digital technologies. In other words, this study seeks to identify some impeding factors associated with the promotion of digital orientation among service-based firms. Simply put, the study assesses the impact of; the perceived knowledge gap, perceived cost burden, technology adaptation, and digital orientation towards digital infrastructural deficit among service-based firms. This paper addresses these issues by building on the work of Lonial and Carter (2015) and other literature (see, Odia & Odia, 2013; Wei et al., 2020; Wei & Zhang, 2008; Yayla & Hu, 2012) to present the digital orientation concept. Lonial and Carter (2015) emphasize that market, entrepreneurial and learning

orientations are the three key oriented metrics that impact small and medium firms' performance. The authors add that, reaping the gains of organizational orientation requires a synchronization of the metrics with the availed resources to mitigate the effect of resource slack. Nonetheless, this study argues that, given the significant role of emerging technology in shaping the orientation of service-based firms, understanding the factors that support their performance vis-à-vis the digital orientation environment is imminent.

Theoretically, the study is critical to the development of digital orientation as it allows researchers to advance from traditional operating methods to using simplified technologies for profit maximization (Thompson et al., 2013). Practically, the study again recommends practitioners of service-based firms cultivate the habit of investing in human and technical capacities to optimize the benefits of the evolution of digital technologies. The remaining of the paper is structured as follows. The next section reviews the key literature on Service-based firms' innovation. Section 3 presents the methodology and data sources for the empirical analysis of digital orientation. Section 4 presents the empirical results and the robustness test using the Structural Equation Model, and Section 5 considers the results in light of previous studies and concludes with recommendations and suggestions for further research.

## 2. Theoretical background and hypotheses development

### 2.1. The resource-based view (RBV)

The proponent(s) of RBV argues that firms that intend to achieve a competitive advantage could do so by relying on a managerial framework that encompasses the strategic resources a firm can exploit to achieve such a goal (see Barney's, 1991). In this light, it is imperative to note that digital technologies are essential resources that give a competitive edge to modern businesses in the contemporarily global world. The business environment (specifically, the internal environment) is engulfed with both strengths and weaknesses. This is because the internal environment consists of forces over which such an organization has absolute control over them. Again, RBV theorizes that firm-specific capabilities can differentiate successful firms from unsuccessful ones (Barney et al., 2001). The theory suggests that the deployment of cost-effective resources ranging from logistics to human resources by a firm tends to direct the path the firm seeks to attain. In low digitalized economies, the application of innovation and sophisticated technologies in service-based firms' operations remained underused (see, Davis & DeWitt, 2021; Zahra, 2021). The current study, therefore, take inspiration from the lens of RBV to strengthen the present argument that; for digital technologies to be fully integrated into modern service-based firms in a developing context, the resistance to its adoption, hitherto, must be unearthed for a strategic management consideration from the viewpoint of technology developers to technology users (service-based firms). The study synthesizes resource availability as a critical success factor for firms' competitiveness, performance, and sustainability.

### 2.2. Digital infrastructure deficit

Infrastructure deficit according to Buyana et al. (2014), explains a situation where urban population growth rates outpace the availability and access to infrastructure. Organizations invest in infrastructure for growth and expansion. Service-based firms invade new markets to get new customers. To cater to the global markets, service-based firms need available resources to make their daily business operations smooth. Infrastructure firms seeking better performance are cost-effective raw materials such as new technology or access roads to market their produce. Most developing economies do not get the necessary investment for infrastructure development and therefore rely on the government compared to advanced economies. On the contrary, the investment made in developing economies is primarily due to available natural resources which are fast depleting and widening the deficit gap (Wei et al., 2020). Coupled with an imbalance between the supply and demand for better service delivery has made infrastructure development very difficult for service-based firms and the government (Miller & Spoolman, 2014).

Firms are aware of the problem and getting worried about sustainable procurement and supply chain management to ensure smooth business operations (Akpan et al., 2022). They are now shifting from depending on the government for infrastructure development. Apart from service-based firms adopting sustainable production methods, infrastructure is required for the smooth execution of operations for firms to dominate the local and international markets. Ifere et al. (2022) found that SMEs are significantly constrained from connecting to the global value chain due to resource deficits and infrastructural impediments. Earlier, MEHTA et al. (2021) affirmed that the deficit arising out of the lack of emerging technology in service-based firms makes them uncompetitive. In other words, an infrastructure deficit makes firms fragile. Lack of infrastructure has almost made it impossible for service-based firms to continue their journey resulting in the closure of many firms. In effect, the operational activities of firms are impacted, and their market competitiveness on the global stage is reduced as a result of resource deficits and infrastructural impediments.

### **2.3. Perceived knowledge gap**

The knowledge gap hypothesis proposed by Tichenor et al. (1970), is that the increasing diffusion of information through mass media will exacerbate existing inequalities in knowledge between different socioeconomic statuses (SES) rather than reducing them. Knowledge and earning are seen to play vital roles in firms' internationalization processes and perceived market uncertainties (Linville et al., 2012; Zhong et al., 2021). The knowledge gap shows that individuals with higher socioeconomic status absorb information from social media and print media faster than individuals with lower socioeconomic status (Wei & Zhang, 2008). From the technology adoption point of view, a knowledge gap exists due to lax communication skills, limited prior knowledge, social media/internet contact, and poor resource structure (Csótó, 2019).

Although knowledge about the internet is conceptually a distinctive construct, there has been a limit between internet experience and internet knowledge and self-efficacy are fairly unclear from previous studies. Often, studies consider the constructs mediating variables (Venkatesh & Zhang, 2010). However, the concept of experience is often interchanged to mean knowledge when users become familiar with and more knowledgeable about technology. Furthermore, experience measurement often overlaps with the knowledge asserted in most literature (Tekinarlan, 2008). Although it is imperative to accept the fact that internet knowledge is quite different from internet experience, the former suggests what one knows, and the latter shows what one has completed. Csótó (2019), opined that, due to limited knowledge of internet awareness and use, the choice of communication channel for managing public administrative issues in Hungary was hampered. Similarly, Peykani et al. (2022) reiterated that the knowledge gap creates insufficiency in the role of innovative activities that shape organizational strategy. Li and Cho (2021) aver that constant social media engagement predicts a lesser knowledge gap in the political circus. Against this background, we propose that:

*H1: Perceived knowledge gap would have a positive association with digital infrastructural deficit among service-based firms.*

### **2.4. Perceived cost burden (PCB)**

Douglas and Craig (1996) considered it a requirement for service-based firms to meet their standards with their competitors and evaluate their competitive position. Cost burden refers to the hidden cost of labor and inventory that a company has to pay for when delivering services (Eichfelder & Hechtner, 2018). Cost burdens are implicitly indirect and impact the direct cost of production. Whereas the burden rate for labor relates to the costs like payroll taxes and insurance, inventory burden primarily captures direct material and labor costs per product (Akpan et al., 2022; Panda & Dash, 2014). Many authors have assessed the number of spillover effects for larger firms on local firms due to the cost burden (Gilmore et al., 2013; Litjens et al., 2012). Service-based firms'

inability to acquire the needed resources and adopt new forms of technology results from the perceived cost burden associated with the technology (Leonelli et al., 2022; Man et al., 2008). We therefore argue and hypothesize that;

*H2: Perceived cost burden by firms would have a positive association with digital infrastructural deficit among service-based firms.*

### **2.5. Innovation update (IU)**

Technological innovation is instrumental in a firm's competitiveness and, therefore, important for firms that want to develop and gain a competitive advantage over their competitors (Odei et al., 2021). In fact, among service-based firms, there is substantial evidence to show that service-based firms across different sectors carry out technological innovations (Ghosh et al., 1993). Given this, two important issues need to be addressed: (i) Why and how do service-based firms undertake their innovations? (ii) What do they achieve due to their strategic business innovations? Although variant literature explains some of these issues, most findings differ. Some authors assert that the firm's internal competence and entrepreneurial motivation drive service-based firms towards innovation (Odei & Novak, 2020). But, Roper (1997), has discovered that service-based firms depend not only on internal knowledge sources but also on external sources. These studies have shown that neither internal knowledge sources of the firms alone nor customer requirements alone will drive service-based firms to undertake innovation. Furthermore, according to Bala Subrahmanya (2009), innovation will spring up only when a competent technical firm can identify and respond to customer specifications by developing products and services. Do service-based firms contribute directly to service-based firms' performance if service-based firms succeed in their innovation activities? Odei and Stejskal (2018) found that innovation helped Slovak and Hungarian firms improve their performance in terms of products, services, and market share. Again, similar studies conducted by Odei and Stejskal (2019) discovered that internal and external collaboration improved process and product development. Odei and Amponsah Odei (2020) found that strong collaboration has also increased products and services among European firms. Hence, we hypothesize that;

*H3: Rarely innovation updates would have a positive association with the digital infrastructural deficit among service-based firms.*

### **2.6. Digital orientation (DO)**

Digital orientation of the concept of using advanced technologies like social networks, mobile apps, and digitized processes to focus more on the digital business market (Quinton et al., 2018). Do helps firms increase their profitability, creates new value and market share, and makes a business want to move into the digital market. A firm's strategic orientation asserts its beliefs about how the business should be operated and the activities it needs to follow (Matarazzo et al., 2021). For instance, firms that have adequate market orientation deliver excellent customer value and support the generation of market intelligence by factoring in current and future customer needs. Some studies have shown a positive relationship between organizational performance and strategic orientation in different countries (See, Lonial & Carter, 2015; Yayla & Hu, 2012). This positive relationship has shown that strategic orientation shapes organizations to be in line with the market and respond to customers' queries. Indeed, customer orientation is characterized by perceived knowledge gap (PKG) and perceived cost burden (PCB) which is often emphasized within service-based firms' behavior (Battat et al., 1996). Strategic orientation should be seen as one key organizational resource and its adoption involves an intention to seek out and fully understand information to identify new opportunities (Akpan et al., 2022). Service-based firms that adopt strategic orientation perform better than larger firms because their size enables them to disseminate market information which is later shared within firms by the employee (Cenamor et al., 2019). However, adopting one specific strategic



orientation can be disadvantageous to the extent that service-based firms although firms may be digital-oriented, may have inadequate capital for infrastructure expansion. Again, strategic orientation may become reactive to consumers' needs and might not encourage innovation (Amankwah-Amankwah-Amoah et al., 2021). In this light, we hypothesize that;

*H4: Irregular digital orientation would have a positive association with the perceived digital infra-structural deficit among service-based firms.*

### 3. Methodology

#### 3.1. Sample, data collection, and analytic techniques

To achieve the study objective(s), the authors adopted a non-randomized sampling technique, specifically, convenience sampling in selecting the study's participants. To be more precise, a structured questionnaire was developed and administered to firms in the category of service-based organizations in the Ghanaian economy. The adoption of convenience sampling in this study is deemed to be appropriate since recent articles in the context of service-based firms relied on the assumptions of non-probability sampling techniques such as availability and eagerness to produce the required information needed to execute this study objective (Fraccastoro et al., 2021; C. N. Wang et al., 2020; Thi et al., 2020). The structured questionnaire was designed using Google forms and distributed via respondents' emails and WhatsApp platforms to facilitate a larger coverage of responses (Attor et al., 2022; Bruce et al., 2022). The online google forms were restricted to one respondent to eliminate duplication of responses. For ethical consideration purposes, consent was first sought from the selected organization through their emails seeking permission to embark on the data collection from voluntary respondents. The structured questionnaire was therefore answered by both management and employees of these selected Service-based firms.

The authors would like to emphasize that, before the main research data collection, a pretest (pilot study) of 40 employees was conducted to prune the variables and constructs under study. This was achieved through the reliability and validity test of the constructs, specifically, with the values of Cronbach alpha. All items in the questionnaire were valid since they all fell within the acceptable reliability threshold. The study used the 0.5 threshold as the benchmark (J. F. Hair et al., 2019). Furthermore, five months were used to execute the data collection processes, specifically, from January-May 2022 by which each respondent used an average minute of seven to answer the questionnaire. In the end, a valid response of 466 representing (93.57%) out of the 498 total valid responses received was used after taking off the incomplete responses in some of the answered questionnaires. Regarding the data analysis, the research hypotheses were tested with the help of the PLS-SEM (Partial least squares and structural equation modeling) technique particularly, the ADANCO 2.2.1 software version. The study adopted this technique for the data analysis due to its robustness for composite-based structural equation modeling and confirmatory composite analysis (see, Henseler, 2017; Schubert et al., 2018). Table 1 below shows the respondents' characteristics of the final data set.

#### 3.2. Measurement of the constructs

The constructs measurements regarding this study items were adapted from previous studies to ascertain the content validity. Constructs such as the Perceived Knowledge gap (Su et al., 2014; Vaterlaus et al., 2015), Perceived cost burden (Ainin et al., 2015), and Digital orientation among service-based firms (Ericson et al., 2016), Technological/Innovation Update (Haseeb et al., 2019; Chan et al., 2018; L. De & Ter-Minassian, 2020), and the predictor construct Perceived Infrastructural Deficit (Wei et al., 2020). A five-point Likert scale comprising Completely Disagree (1), Disagree (2), Neutral (3), Agree (4), and Completely Agree (5) was adopted in measuring each construct item in this study.

Table 1. Respondents' Profile			
Details		Frequency	Percent (%)
Gender	Male	321	68.88
	Female	145	31.12
Age	20-30	166	35.62
	31-40	179	38.41
	41-50	101	21.68
	51 above	20	4.29
Educational level	SSSCE	75	16.09
	HND/Diploma	101	21.68
	Degree	215	46.14
	Masters/PGD	75	16.09
Industry Category	Non-Financial Service Sector	158	33.91
	Financial Service Sector	308	66.09
Employee Size	Micro (1-10 employees)	56	12.02
	Small (11-60 employees)	178	38.20
	Medium(61-100employ above)	232	49.78
<b>Sample size (n)</b>		<b>466</b>	<b>100</b>

Source: Field data (January-May, 2022), retrieved from google form

### 3.3. Test of common method variance

There is a potential possibility of common method variance since the study draws its data independently. Additionally, the participants used in this study were assured of protecting their data as confidential and informed that there was no wrong or right answer to every question they answered in this survey. Per the research of Bagozzi and Yi (1988), the presence of Common Method Bias (CMB) was ascertained which informed the researchers to subsequently design the questionnaire with the description on the title page and to treat respondents or participants with utmost confidence. To be more precise, the questionnaire was developed such that the respondents or participants can opt-out as and when they wanted to do so. Above all, the researchers, performed a multicollinearity test concerning VIF (variance inflation factor) to reveal the existence of Common Method Bias (CMV). The results of post-hoc evaluation reveal that CMV has a minimal existence based on VIFs (see, Table 3) where the thresholds are less than ten (10) as revealed by (see Alin, 2010; Podsakoff et al., 2003). Finally, on the issues of CMB in this survey, it is regarded to be minimal, therefore the CMB is of less concern.

### 4. Model measurement

The constructs' reliability and validity were vigorously measured through Dijkstra-Henseler's rho with Cronbach alpha coefficients following the recommendations of PLS-SEM application literature (see, J. F. Hair et al., 2019; J. Hair et al., 2017). Since the values of the coefficients are all above 0.5 thresholds (see, Table 2 below), it indicates the accepted levels of coefficients of the constructs as established by (Bagozzi & Yi, 1998; J. F. Hair et al., 2019). The adoption of the ADANCO 2.2.1 version was used in assessing the psychometric properties concerning the underlying items of the research constructs. Again, the composite reliability of constructs as shown in (Table 2) recorded 0.7 and 0.8 minimum and maximum thresholds concerning Jöreskog's rho ( $\rho_c$ ) and Dijkstra-Henseler's rho ( $\rho_A$ ) which fulfills the basic requirements. With regards to Dijkstra-Henseler rho ( $\rho_A$ ), 0.7126 and 0.8415 were respectively recorded as coefficients of constructs reliability, and finally, a minimum threshold of 0.5 was recorded regarding the average variance extracted (AVE) which stands for convergent validity as revealed in Table 2.



As revealed by Bagozzi and Yi (1998), all the factor loadings of the constructs were importantly assessed and loaded to their respective positions which met the requirement of 0.6 which shows how relevant the indicator is. From the below table, the coefficients of the respective constructs were all above 0.6 showing 0.6248 as the minimum and 0.9357 maximum loadings respectively. The details of the research constructs with their corresponding loadings are all shown in Table 2 below. Also. The issue of multicollinearity was of great concern to the researchers and was detected with the help of common method variance (CMV) through the scale measurements of variance inflation factor (VIF). As per the works of (Kwarteng et al., 2020; MacKenzie & Podsakoff, 2012), CMV is not an issue since the VIF is less than five against a maximum threshold of ten. The factor loadings of the research constructs are therefore shown in Table 2 below.

Notwithstanding, Henseler et al., (2015) inspired the researchers to evaluate the existence of the discriminant validity of the latent variables through Fornell-Larcker (1981). As established by experts like (J. F. Hair et al., 2019; Henseler et al., 2015), all the values in the diagonal form (bold) exceed the minimum requirement of greater than 0.5 which reveals the average variance extracted (AVE) of the measured constructs (see, Table 3 below). Fornell-Larcker's criterion of the discriminant validity shows the basic and stringent assumptions of the research constructs were established once each construct of AVE must be higher coefficients (both column and row position) over the other constructs.

**Table 2. Construct reliability and validity, variance inflation factors (VIFs), and factor loadings**

Constructs/ Indicators	VIF	Factor Loadings	Dijkstra- Henseler's rho ( $\rho_A$ )	Jöreskog's rho ( $\rho_c$ )	Cronbach's alpha( $\alpha$ )	The average variance extracted (AVE)
PKG			0.8415	0.8443	0.7694	0.5809
PKG1	1.6373	0.6248				
PKG2	1.6355	0.6553				
PKG3	2.1543	0.8592				
PKG4	2.1328	0.8750				
PCB			0.8636	0.9020	0.8393	0.7544
PCB1	2.2414	0.8809				
PCB2	1.9368	0.8377				
PCB3	1.8727	0.8862				
DOR			0.7126	0.9316	0.9321	0.7323
DOR1	2.7869	0.8034				
DOR2	3.0094	0.8881				
DOR3	3.9180	0.9357				
DOR4	3.5712	0.7750				
DOR5	2.8127	0.8667				
TIU			0.7760	0.8659	0.7688	0.6828
TIU1	1.5402	0.8421				
TIU2	1.7110	0.8347				
TIU3	1.5145	0.8016				
PID			0.7266	0.8395	0.7147	0.6360
PID1	1.2622	0.7543				
PID2	1.5385	0.7895				
PID3	1.5441	0.8459				

Source: Authors' processing from ADANCO 2.0 version

Note Perceived knowledge gap (PKG), Perceived cost burden (PCB), Digital orientation(DOR), Technological/ innovation update (TU), and Perceived infrastructural deficit(PID).

1 = Perceived knowledge gap	0.5809			
2 = Perceived Cost Burden	0.2216	<b>0.7544</b>		
3 = Perceived Infrastructural Deficit	0.2401	0.1596	<b>0.6360</b>	
4 = Technological/ Innovation update	0.0998	0.0331	0.1026	<b>0.6828</b>
5 = Digital orientation among SMEs	0.0046	0.0045	0.0000	0.0042 <b>0.723</b>

#### 4.1. Structural modeling-Path analysis

The researchers saw the essence of the path analysis otherwise called structural modeling in this current study which concerns the model fit. The significance of this analysis is to reveal the causal effect of the research constructs. Therefore, the findings of the study significantly show that Perceived infrastructural deficit (PID) has a potential effect or impact on the current research constructs such as Perceived knowledge gap (PKG), Perceived Cost Burden (PCB), Digital orientation among SBF (DOR) and Technology/Innovation Update (TU). Table 4 below therefore shows the regression coefficients of Beta ( $\beta$ ), significant values; T-values  $>1.96$  (or P-values  $< 0.05$ ) concerning the research model. Additionally, the predictive power which concerns the research model of the values determination of the regression model was evaluated. Hence, the  $R^2$  of the predictive variable (Perceived infrastructural deficit (PID) 30 percent was established as seen in the table 4 and figure 1 below.

#### 5. Discussion

The discussion of the research findings is relevant to the literature since research works on service-based firms are regarded as extremely significant because of their contributions to the development of both developed and undeveloped countries. In this study, five hypotheses were proposed and tested.

The first hypothesis, that **H1**: (*Perceived knowledge gap would have a positive association with perceived digital integration deficit among service-based firms*) is strongly supported by the research findings. The findings of the proposed hypothesis, therefore, support the findings of (Odia & Odia, 2013; Su et al., 2014; Vaterlaus et al., 2015) where studies posit that the perceived knowledge gap contributes to the digital integration deficit among service-based firms, especially from a developing country perspective. The knowledge gap theory is one method by which scholars have gauged the relationship between access and use of information resources and information inequalities among different social groups. The researchers, therefore, emphasize that service-based firms must currently upgrade themselves very well in the 21<sup>st</sup> century in the field of knowledge since technology has become part of the organizational system and order of the day. The inexperienced level of management knowledge greatly affects the operations of service-based firms hence causing more infrastructure deficit in the digitalization of an organization and devaluing the purpose of adoption of modern technology. Again, since a high perceived knowledge gap affects service-based firm's performances and development, it is appropriate to consistently ensure that a high level of knowledge is acquired or perceived to eliminate the technology deficit among service-based firm's operations (Pradeep et al., 2021; Y. Wang et al., 2018). Therefore, the concept of experience often interchanges to mean knowledge when users become familiar with or more knowledgeable about technology.

Relatedly, the hypothesis (**H2**) which states that *H2: Perceived cost burden by firms would have a positive association with digital infrastructural deficit among service-based firms* is significantly supported based on the study's result. In this regard, the findings of the studies correlate with that

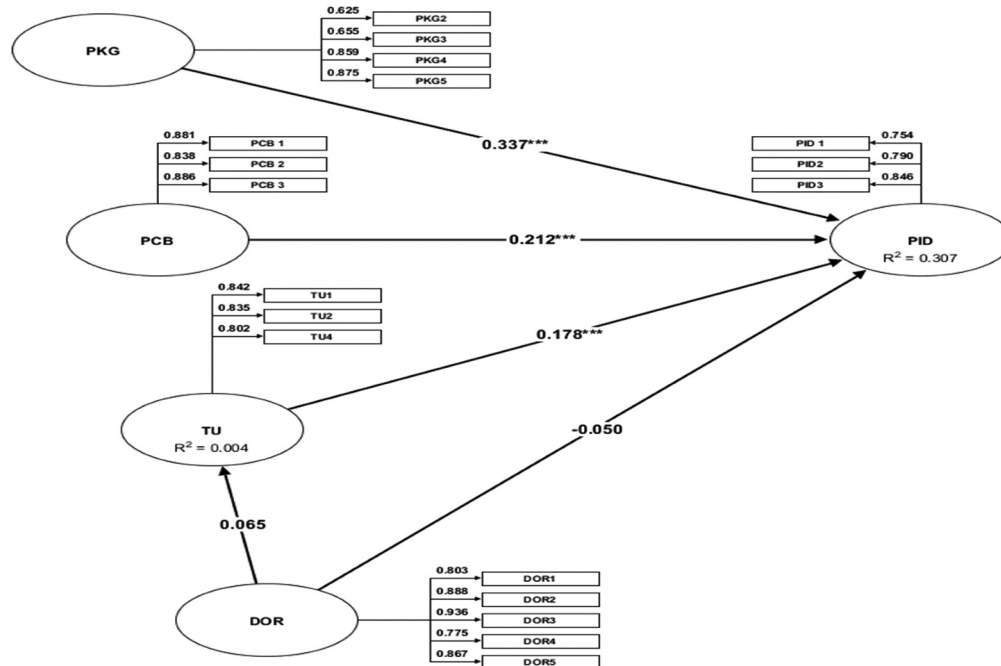
**Table 4. Hypothetical path coefficient -PLS-SEM**

Relationship	Beta ( $\beta$ )	Standard bootstrap results					Decision
		Mean value	SD error	t-value	Effect size (Cohen's $f^2$ )	P-value	
H1: PKG-> PID	0.3374	0.3389	0.0657	5.1327	0.1188	0.0000	Agreed
H2: PCB -> PID	0.2115	0.2091	0.0638	3.3142	0.0501	0.0005	Agreed
H3: TU-> PID	0.1785	0.1793	0.0531	3.3619	0.0412	0.0004	Agreed
H4: DOR-> PID	-0.0497	-0.0562	0.0626	-0.7941	0.0035	0.2831	Not Agreed
<b>Independent Variable</b>	<b>Coefficient of determination (<math>R^2</math>)</b>						
Perceived infrastructural deficit (PID)	0.3070						0.307
Technology/Innovation Update (TU)	0.0042						0.0004

**Author's processing from ADANCO 2.2.1 version**

Perceived knowledge gap (PKG), Perceived cost burden (PCB), Digital orientation(DOR), Technological/Innovation update (TU), and Perceived infrastructural deficit (PID).

**Figure 1. Estimated research model.** source: authors' processing from ADANCO 2.1 Version.



of (see Muslim et al., 2020; Ainin et al., 2015; Ahmedova, 2015) where it was established that cost plays a major role in the administration of service-based firms' integration of digitalization. Thus, service-based firms suffer a perceived cost burden during and after digitalization for operational purposes. Perceived cost burden limits or affects the potential usage of developing countries' digitalization. Service-based firms always consider the perceived cost burden as a great factor based on their financial stability in choosing a technology/innovation. Thus, the researchers argued that managers of small and medium enterprises within developing countries' fraternity should devise means of reducing the perceived cost burden regarding the integration and installation of technology to meet the current demands of customers since customers are more dynamic today in the usage of digital devices. Nonetheless, service-based firms' managers must develop an interest in controlling cost burdens from both organizational and customers' perspectives since digitalization among service-based firms makes them not only more innovatively, but also competitively (Wardati & Mahendrawathi, 2019).

Concerning hypothesis (H3), which states that: *rarely innovation updates would have a positive association with the digital infrastructural deficit among service-based firms* is strongly affirmed by the study's findings as well as the confirmed studies (see Haseeb et al., 2019; Chan et al., 2018; L. De & Ter-Minassian, 2020). In the affirmed studies, it was revealed that a positive relationship exists between regular innovation updates and the perceived digital integration deficit. Service-based firms' irregular innovation update affects them strongly which translates into their performance. In addition to that, innovation update consistently becomes an impediment to service-based firms' integration of digitalization because it requires technical personnel, financial and capital injunction, maintenance, and acquisition of full software packages, and hardware requirements of some important functions among others. The authors, therefore, suggest that regular updates by service-based firms will enhance them both innovatively and competitively in local and international business markets and finally contribute to their sustainability agenda. Again, service-based firms must develop a keen interest in establishing ICT infrastructures and services to maintain the integration of digitalization in constant running (Getahun, 2020).

Lastly, the findings from the research empirically do not support the hypothesis (H4): *Irregular digital orientation would have a positive association with the perceived digital infrastructural deficit among service-based firms*. Even though, the study contrasts the findings (Haseeb et al., 2019;

Ericson et al., 2016; Elena, 2020). This makes the results uncorrelated with the hypothesis. This phenomenon, in the opinion of the authors, will further energize service-based firms' managers to regularize their digital orientation to reduce the infrastructure deficit of digitalization which will avail new markets and opportunities for service-based firms. For instance, firms that have adequate market orientation deliver excellent customer value and support the generation of market intelligence by factoring in current and future customer needs. Some studies have shown a positive relationship between organizational performance and strategic orientation in different countries (See, Lonial & Carter, 2015; Yayla & Hu, 2012).

### **5.1. Managerial implication**

Technology continues to transform how businesses operate in contemporary times given the competition among service-based firms. This makes the adoption of innovative business strategies a must in revolutionizing how businesses interact with their stakeholders. Meeting this requires the needed resources to match the demand for a time among service-based firms. It is thus instructive that this study brings to the fore the need to enhance the resources needed by service-based firms to improve their competitiveness. In particular, in developing countries where firms struggle to resource their operations to enhance their competitiveness, the findings of this study reaffirmed the need to invest in innovative technology (Chan et al., 2018). The recent Covid-19 pandemic and its consequences for instance, have impaired business activities, which has redefined the way businesses operate. Given that this emerging trend drastically improves efficiency and brings forth sustainability, in most emerging economies, digital evolution has been slow due to the lower orientation towards this development. Thus, making this study practically significant in the face of the new normal in business activities.

While the study sought to investigate how service-based firms are constrained with full integration of digital orientation, compelling evidence was found to support the argument. We found that infrastructural deficit is apparent among service-based firms with consequences for the sustainability of the firms. For instance, the findings that perceived knowledge gaps, cost burden, and innovation updates inhibit the digital infrastructure are essentially informative to managers of service-based firms.

The knowledge gap practically exacerbates inequalities in the acquisition, understanding, and appreciation of technology. Given that earnings and knowledge critically drive knowledge acquisition and transfer in organizations, limiting the knowledge gaps among employees significantly reduces the aversion to digital transformation. The current study suggests that firm managers improve their knowledge management practices to improve sustainability, particularly when experience is misinterpreted as knowledge. Moreover, in instances where internet awareness and its use are limited, settling on the right internet-based technology to enhance service operations becomes a challenge. This, often, is the consequence of a knowledge deficit among managers and staff of service-based firms.

Furthermore, cost implications inhibit the adoption of new technology. In instances where service-based firms are faced with stiff competition, they tend to implore hesitant strategies. These knee-jerk and panic-driven strategies come with cost implications for the firms. This implies that the cost burden significantly impedes the digital orientation of businesses, making them unsustainable. Thus, making this study is worth dependent on managers to leverage to understand the implications of a cost burden to digital orientation.

Besides, having a positive attitude towards digital orientation does not automatically bridge the deficit in the technology gap. Processes leading to the adoption and implementation of the innovations in the business coupled with what the business seeks to achieve in the end, lead them to their competitive strategy. This calls for a strong collaboration to enhance the updatedness of technologies needed for the transformative agenda of businesses. Practically, businesses are in a better position to create value and market share toward profitability due to a positive

orientation towards emerging technology. The consequence is that excellent customer value is generated amid adequate market orientation. Thus, this study presents a mammoth framework through which service-based firms can change the face of their business operations to become profitable, competitive, and sustainable.

## 6. Conclusion

There is no doubt that digital technologies such as smartphones, social media, and online transactions are essential tools with huge potential that service-based firms can leverage to integrate into their operation, grow and maximize profit. However, despite its huge potential, especially in service-based firms, it has a digital infrastructure deficit, especially in low-digitalized business environments. This study examined the antecedents of the digital infrastructural deficit among service-based firms in a developing country. The study found evidence supporting three hypotheses. The study revealed that the perceived knowledge gap, perceived cost burden, and innovation updates are factors inhibiting the digital infrastructure deficit among service-based firms. The findings suggest that measures targeted at these factors will reduce the infrastructure deficit among service-based firms to enable them to maximize their full potential. Service-based firms should be oriented on the significance of digital technologies in their operations. This can be achieved through training programs and seminars to enhance their knowledge of digital orientation. Moreover, they should also be made aware of its net benefit to their businesses. The benefits of using digital technologies far outweigh the cost, therefore service-based firms in low-digitalized economies should be more digitally oriented to disabuse their mind of the perceived cost associated by embracing and integrating it into their operation. Finally, service-based firms should invest in developing their human and technical capacity to be able to effectively integrate and ensure technology adaptation in their operational system. These measures will go a long way to reducing the digital infrastructure among service-based firms in general.

## 7. Limitations

This study comes with some limitations. First, the focus on the service-based sector advertently makes it limited in terms of scope. While we acknowledge that the service-based sector is key to most developing countries, future studies could focus on other sectors to extend the empirical knowledge. Secondly, the study uses the RBV as the underlying theoretical lens and explicated some constructs from the extant literature. Future studies could relook at service-based firms and digital orientation from another theoretical perspective. Nonetheless, we are optimistic that, this paper proffers substantial empirical implications for theory and practice.

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