

Impact of ICTs on Core Competences of SMEs in Bukavu, DRC

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Abstract

Currently, it has been noticed a strong use of ICTs in several companies. The objective of this study was to analyze and measure the impact of the implementation of ICTs on the strategy and structure of management of core competence in SMEs in Bukavu, DRC. The scale used shows the good psychometric properties ($\chi^2 = 75.045$; $P = 0.16$; $\chi^2/ddl = 1.471$; CFI = 0.92; IFI = 0.92; RMSEA = 0.049; NFI = 0.79; GFI = 0.94; AGFI = 0.91). This study analyzed primary data collected from 195 SMEs in the city of Bukavu. Data processing was achieved using exploratory and confirmatory factor analysis and flat sorting. The results indicate that the use of ICTs by SME managers in the city of Bukavu has a positive impact on all dimensions of core competence selected in this study. They also reveal that the views of these leaders on the importance attached to the adoption of ICTs were divided and the level of ICT use was above average.

Keywords

ICTs, SMEs, Production Process, Market Access Process, Distinctive Functional Contribution of the Product

1. Introduction

The concern for unlimited access to a large amount of information pushes people to make use of new information and communication technologies (NICTs). The analysis of the impact of this technology on companies' core competences is one of the constant concerns of economists and managers [1]. By core competence we mean the company's ability to achieve its objectives [2]. This work is particularly interested in the effects of different uses of information and communication technologies on the core competences sought within small and medium-sized enterprises in the city of Bukavu during the 2022 financial year. We do not intend to go beyond our field of analysis towards the field of knowledge, which requires

another approach and other analytical tools.

About Information and Communication Technologies (ICTs), companies operate in an entirely different environment in the 21st century Compared to other centuries. Whether economically, politically, or socially, the variables have completely changed. The era of relative stability is over. There is a transformation of markets and economies but also, disappearance of the old rules of the game in proportion to technological evolution [3].

In recent years, Information and Communication Technologies (ICTs) have become a new vehicle for changing economic growth. They have turned the planet into a small village while changing user behavior. The association of computers and communications has made it possible to circulate information in the world, whoever holds it has the power. Information is, without doubt, the raw material of the future. Because of this importance, there has been the wave of information technology [4] [5].

In organizations, the growing use of ICT essentially follows an economic logic: it is a question of being more responsive, cheaper, and bringing a plus to the customer or user. The new possibilities offered in network switching allow managers or executives to supervise, to make an efficient allocation of resources for the realization of activities that, momentarily, become central according to their value or uniqueness, regardless of the size of the company [6] [7] [8].

Small and medium-sized enterprises (SMEs) operate in a constantly changing environment, which requires managers to implement action plans likely to direct activities towards the desired objectives, to be competitive and create wealth [9]. These firms are family-owned and play a considerable role in the economies of most countries. They account for between 50 and 90 per cent of the gross domestic product of all market economies [10]. They employ more than 75% of the world's workforce, and create more than 86% of new jobs in the United States (Ramadani *et al.*, 2015) and more than 80% in the DRC [11].

In the context of the DRC, the economic fabric is essentially made up of SMEs. A total of 80.7% of SME managers own the SME [12]; 72.7% of SMEs are family-owned (World Bank, 2014) and whose owner-manager is the main stakeholder [13]. The latter is involved in all aspects of management. It is pragmatic that, at present, we cannot avoid the important role of SMEs in the development process of a country because they are not only a local economy but also and above all the lung of development [14]¹.

In the context of the city of Bukavu, strategic choices in SMEs are influenced by family, ownership, management, and the perception of succession by its leaders [15]. Almost all the difficulties of SMEs stem from management. Given the importance of SMEs and their inevitable role, it is therefore necessary to examine the introduction of ICTs in their management as a solution to the difficulties they face. The SME without difficulty will be qualified as competent from the point of view of management. However, research on the ICTs-competence link

¹World Bank, New Report Highlights Major Economic Opportunities in Clean Technology for SMEs in Developing Countries, September 24, 2014.

does not make it possible to decide on the nature of this link: a direct and positive relationship is not systematic [16] [17] [18]. It seems that ICTs do not in themselves influence competence in an enterprise, but that it is through organizational processes and facilitating dissemination conditions that they will have an impact on the different skills sought within the company [19]. Thus, a question emerges and guides this study: **what is the impact related to the use of ICTs on the strategic management of core competence in SMEs in the city of Bukavu?**

The perception of the strategic role of ICTs and their impact on the content and organization of work is a recurring topic in many theoretical and even empirical studies [3] [5] [6] [7]. However, most of them have been conducted only in developed economic contexts, notably in the USA, Europe, and a few in North Africa. This study aimed to fill this gap by pursuing the following complementary objectives: a) To analyze and measure the impact of the implementation of information and communication technologies on the strategy and management structure of basic competences in SMEs in Bukavu, Democratic Republic of Congo where ICTs integration is relatively recent [3], during the 2022 financial year. b) Discuss the psychometric properties of the scale used and c) identify the dimensions and attributes that managers value within SMEs as well as the weights they give them in the context of the city of Bukavu.

Based on the theory of the core competence [20], our discussion implies that the need to strategically manage expertise in SMEs leads to the adoption of ICTs chosen by managers, whose effects are positive on the three main areas of core competence including: the productive process (quality, flexibility, cost, timeliness); the process of market access (brand management, marketing, distribution, logistics) and the distinctive functional contribution of the product, *i.e.* the company's ability to differentiate its product through a particular function.

In addition to the importance of information, the presence of many SMEs, alongside large structures, is a dominant feature [21]. Research on SMEs highlights the importance of the owner-manager in small firm decisions, particularly about information technology choices [22] [23] [24] [25]. Skills management, greatly facilitated by the introduction of ICTs, is perceived at the organizational level to best manage its intellectual capital. As knowledge has become both a medium and an important factor for organizational change, the value of ICTs lies in the possibility of generating a large interactive knowledge base that is easily accessible and usable by users. This basis constitutes competence [26].

Due to the preponderance of the owner-manager within an SME, his interest in ICTs has not been neutral. We tried to answer the above question by focusing on small and medium-sized enterprises that have a major need for information management. The city of Bukavu has defined the geographical space of our investigations. This research was based on the results of a survey of 195 SMEs after exploratory and confirmatory statistical analyses in the AMOS 26 software.

The organizational structure adopted in this study presented the introduction to the first point, the theoretical basis for analyzing the impact of ICTs on the core competences of Small and Medium-sized Enterprises to the second point,

The methodological approach to the third point, the presentation and discussion of the results to the fourth point and finally the conclusion to the fifth point.

2. Theoretical Basis for Analyzing the Impact of ICTs on the Core Competences of Small and Medium-Sized Enterprises (SMEs)

2.1. Definition and Background on ICTs

By ICTs we mean information and communication technologies, which more and more of us use every day, at work or at home. Emails, social networks, searching for information on the internet, e-commerce, video, or audio conferencing... [4]. These new practices have significantly improved exchanges, facilitate information sharing and are very fast, potentially help avoid travel and promote teleworking. In recent years, they have imposed themselves both in our professional lives and in our homes.

However, their life cycle analysis shows that they generate specific impacts (raw material and energy consumption) and managing these is often difficult. Power consumption due to ICTs has increased by about 10% per year for 10 years and ADSL² connections, often switched on 24 hours a day, are becoming widespread [27]. In addition, the environmental benefits they hope for must be qualified: paper consumption and travel do not seem to decrease as much as one might have hoped. No one really agrees on the definition of information and communication technologies (ICTs) in a definition.

In a broad sense, some refer to ICTs as everything related to computer and office equipment. They thus include the technologies developed since the birth of the information society; some tools considered traditional (manuals, faxes, etc.) have been excluded from the scope of ICTs.

ICTs include the tools used for collecting, storing, processing, and disseminating information. For example, the sites combine it, ICT burgundy has established a classification of the ICTs sector which is broken down into 7 segments [28]:

- ✦ **Information:** It includes IT service providers as well as activities related to software, IT security and outsourcing.
- ✦ **Communication:** This segment is concerned with service operators, access providers and server operators.
- ✦ **E-Marketing:** Design of Online Sales System: it considers the activities of commerce and call centers.
- ✦ **Multimedia:** Content creation and publishing activities are rediscovered in this sector, but also the e-communication, image, and sound sectors.
- ✦ **Hardware for ICTs:** This segment mainly includes the manufacture of computer equipment, electronic equipment, and communication (RFID)³ storage support devices.
- ✦ **Knowledge Engineering:** This segment concerns e-Learning and electronic

²Asynchronous Digital Subscriber Lines.

³Radio frequency identification (RFID) is a method of storing and retrieving data remotely. The system is activated by an electromagnetic energy transfer between a radio tag and an RFID transmitter.

document management.

- ✚ **Imaging, Visualization, and Control Technology:** In this last segment, are concerned, medical imaging, remote monitoring, or modeling (Computer-Aided Design....).

2.2. The Tools of ICTs

2.2.1. The Intranet

Here, the internet comes from the juxtaposition of two terms: inter which recalls the unifying aspect of this set of networks and net from the abbreviation net Works which means network in English. The intranet uses the technique of the internet on a more modest scale, orienting it inwards (these are the meanings of the word intra). It is a computer network used within a company or any other organizational entity using Internet communication techniques [29]. The intranet is therefore the entity's professional response to the Internet mode. The intranet was able to prove that all its technology, in addition to its low cost, was reliable and perfectly adaptable to the internal needs of the enterprise.

Like the telephone in its time, the intranet has acquired an essential place in the communication system. Its speed of spread is the best proof of this. But its impact on the organization of the company is important since it is accepted that an internet project consists of 80 percent organization and 20% technology [4].

2.2.2. The Extranet

The term extranet refers to an Internet network whose access and authorized to a restricted external public (customer, suppliers, partners) constitute a closed network. The extranet expands access to the Internet to an audience outside the company depending on the type of data and usage. It therefore makes it possible to appropriate intranet tools while developing an infrastructure specific to the firm and controlling security problems. Relationships with customers cannot be limited to the simple exploitation of the web as a commercial showcase within the framework of customer extranet. This collaboration is obviously deep for both parties since it allows a better match of the services of the entity to the needs of the customer easily, saving more time without losing a lot of money.

2.2.3. The Groupware

Groupware is a computer application that allows people who are physically distant or have no common presence to work cooperatively on the same documents beyond messaging functions or shared access to statistical information. GroupWare's tools are used to collectively manage living information and to structure information sharing rules.

Groupware is the set of technologies and associated working methods that, through electronic communication, allow the sharing of information on a digital medium to a group engaged in collaborative and/or cooperative work [30].

2.2.4. Distance Learning

The term open and distance learning, which until recently served to mark the

modality and innovative aims of an educational action (in a non-prudential situation) is being supplanted by e-training (or more often even by e-Learning), signals the more or less effective use of the intranet, it no longer exists in the major national and international meetings that bring together promoters and decision-makers in the field of new technologies educational than virtual: virtual university or virtual classrooms. The discourse on E-Learning, its pedagogical benefits, and its economic future, as well as the disappointments that may be on the horizon, are reminiscent of the phenomena that occurred on previous technical advances in information, communication, and the Internet. This new technology, which combines the potential and industrial challenges of the audiovisual sector, computing, and multimedia, generates the same incantatory and lyrical discourses on the democratization of training, and society, as the first in the 1960s and the second in the 1980s [31].

2.2.5. Social Media

A social network is a set of social enterprises such as individuals or social organizations linked together by bonds created during their mutual interaction. There are sites (application) that help to create a circle of friends, find business partners, a job or identify people with common interests; these sites are grouped under the name “social networks on the Internet” [32].

This term refers to a website allowing the user to register and create a virtual identity card most often called “profile”; the network is called social because it allows to exchange with other members registered on the same network: public or private messages, hypertext links, videos, photos, games...

2.3. The Theoretical Foundations of the Analysis of the Impact of ICTs on the Strategic Management of Competences within the Company

2.3.1. The Impact of ICTs on Competences

Information and Communication Technologies are the symbol of organizational changes in human activity, private but especially professional: the emergence of companies, networks, outsourcing, development of services, automation of informal tasks, codification of tasks, versatility, and flexibility [33]. These changes have repercussions; these are known as technological bias.

This bias is due to the mechanisms whereby the most qualified workers are also the ablest to master the use of new technology; some tasks performed by the least qualified are formalized and transformed into routine, which makes it possible to substitute technology for this category of labor. On the other hand, the most complex tasks, those carried out by managers, managers, or technicians, do not lend themselves to formalization; automation within industry leads to a high demand for skilled labor; ICTs promote the establishment of networked organizations in which employees must demonstrate autonomy, responsibility, and change management competences: the most qualified workers would be better able to work in this type of environment [33].

Over the past twenty years, an abundant literature has been devoted to this subject. This work can be classified into two categories. The first, concerns those which are qualified as works of a global nature, for example, those of the I.T.U (2006), the World Bank (2005 and 2006)⁴ and the OECD (2004 and 2005)⁵ whose main objective is to assess and measure the impact of ICTs on the economy⁶. On the other hand, the second category can be described as work of a regional nature. For example, those of Europe (Action Plan⁷, 2006 and 2010), and SCAN-ICT2 (2005)⁸. According to this approach, impacts are classified into three domains: impacts at the household level; business-level impacts and government-level impacts. This research focuses solely on the impact at the company level in the competence aspect.

2.3.2. Management of Core Competence for SMEs

In this point, we attempt to identify the key management competences that are essential for SMEs. However, it is first very important to stress the fact that such a determination cannot be definitive and unequivocal. There is a rather complex semantic web when it comes to the different dimensions, and aspects of management. Terms may include [34]: knowledge, competencies, skills, attitudes, characteristics, and instincts.

The term “skills” seems to be the preferred word in policymaking, in the public, and private sectors in the United Kingdom and most Western countries [35].

Applicable management competences mean: “the ability to perform work, in a given occupation, according to the standards required by the job.” However, the definition also included “mastery of competences and understanding” and “aspects of self-efficacy”.

As part of this work, we chose the variant of fundamental competences proposed by Prahalad & Hamel [20].

2.3.3. The Theory of Fundamental Skills

The resource and skills model has only been truly successful among practitioners since Prahalad & Hamel’s research on *core* competence [20]. In fact, these authors have the merit of highlighting the essential idea of resource-based theory, namely that a specific combination of scarce resources can make a difference, while making the concept both more operational and directly accessible to managers. To better understand the analysis by fundamental skills, we will first present their general characteristics and secondly, expose the methodology for

⁴World Bank Report 2005 and 2006.

⁵The Plenipotentiary Conference of the International Telecommunication Union (2006) was held from Monday, 6 November, to Friday, 24 November 2006. Sungate Port Royal in Antalya, Turkey.

⁶The best-known works on this issue are those of the United Nations in 2004, UNCTAD (United Nations Conference on Trade and Development) 2004, OECD 2004 and 2005, the International Telecommunication Union (ITU) 2006, and those of the European Community 2005.

⁷Report of the Organization for Economic Co-operation and Development (OECD) is an international organization working for better policies for better lives.

⁸Launched in 2005, and participating countries include: Cameroun, Gambia, Ghana, Mauritius, and Rwanda.

managing key skills, formulated by Hamel & Prahalad [2].

1) The characteristics of core competence

Key competences are defined “as the capabilities that underpin pre-eminence in a range of products or services” [2], or as “a set of knowledge and technologies that enable the enterprise to offer a particular advantage to the customer” [2]. More specifically, according to Prahalad & Hamel [20], to be qualified as fundamental, skills must meet three very general characterization criteria:

a) Bring real added value to customers. It is the client who ultimately decides whether competence is fundamental or not. Admittedly, he can only build his judgment based on the observable consequences on the products, but if this skill significantly increases the value in the eyes of the customer, then this skill can be considered fundamental.

b) Be different from those of competitors. To be fundamental, competence must be unique, without equivalent on the market. “This does not mean that it belongs exclusively to a company, but quite simply that any capability that is almost universal within a given sector of activity deserves this qualification only if the company demonstrates a level of competence significantly higher than that of all its competitors” [2]. This differentiation from competitors refers to the criteria of scarcity and inimitability.

c) Feed a diversity of offers in different markets. Key competences serve as a springboard to new markets where they can be transferred. Therefore, a fundamental organizational competence is measured by its elasticity, *i.e.*, according to the number of possible gateways to the markets of tomorrow [2]. In other words, the key competences are transversal in relation to the company’s products and services. They are deployed in several strategic segments at the same time, or in several divisions of the company. Some companies do this better than others and know how to leverage their core competences for a wide range of products.

Based on this characterization, Hamel differentiates three main areas of fundamental competences [36]:

- The production process (quality, flexibility, cost, speed of execution, compliance with deadlines).
- The market access process (brand management, marketing, sales, logistics).
- The distinctive functional contribution of the product, *i.e.*, the company’s ability to differentiate its product through a particular function.

2) Management of core competences

Once core competence is identified, they should then be harnessed, opportunities for improvement considered, and opportunities for acquiring new skills explored: can the company combine its skills to offer new products and services in a different way? Is it possible to implement them for another target? Is it possible to acquire additional skills that would open the possibility of manufacturing a new range of products and services?

For the core competence perspective to take root in the company, the management team must contribute to the following six stages of competency management [2]:

Step 1—The identification of the organization’s resources, including the identification of existing organizational skills. Leaders take inventory of organizational resources and skills in a completely random or power-driven manner.

Step 2—Identification of strategic resources, including core competence. In an organization, the number of organizational resources and skills is so high that it is necessary to limit the analysis to strategic organizational resources and skills.

Step 3—The deployment of fundamental skills. These need to be implemented to be reliable and maintained.

Step 4—The establishment of a program to acquire new fundamental skills. To do this, the company can design a matrix that opposes the type of market in which the company is located (existing or new), to the nature of the core competence (existing or new), as explained in the scheme on the next page (see **Figure 1**).

Step 5—The development of new core competence. they recommend here to identify opportunities that escape the attention of the competition or to be able to exploit other resources through early and tireless efforts to develop the necessary skills, which competitors would consider out of reach.

Step 6—Protection of core competence from competitors and “wear of time”. Regular “skills stocktaking” meetings should address issues such as investment requirements, plans to strengthen relevant technologies and knowledge, distribution patterns, changing alliances and external procurement.

3. Methodology

3.1. Background of the Study, Population and Sample

The general objective of this research is to analyze and measure the impact of the implementation of information and communication technologies on the strategy and management structure of basic competences in SMEs in Bukavu, Democratic Republic of Congo where ICTs integration is relatively recent, during the 2022 financial year. The choice of this topic was dictated by the almost non-existence of work on the impact of the use of ICTs on the achievement of the objectives of the firms, whereas the objectives can only be achieved with the competences developed within the organization. That said, a study related to the impact of ICTs on the core competences in demand in SMEs is worth its weight in gold [37]. In addition to fitting with my field of research, this study interests me personally because it will highlight the effects of the use of technologies not only on the social life of leaders but also and especially on the achievement of objectives. The results of this research will serve as a basis for the adoption or not of new technologies by public and private managers depending on whether they influence the core competences of the organization.

This study analyses the primary data collected on SMEs managers in the city of Bukavu. The focus on the leaders of the city of Bukavu is dictated by the accessibility and multitude of SMEs in Bukavu. According to the 2020 report of the Provincial Inspectorate of Small and Medium Enterprises and Handicrafts of

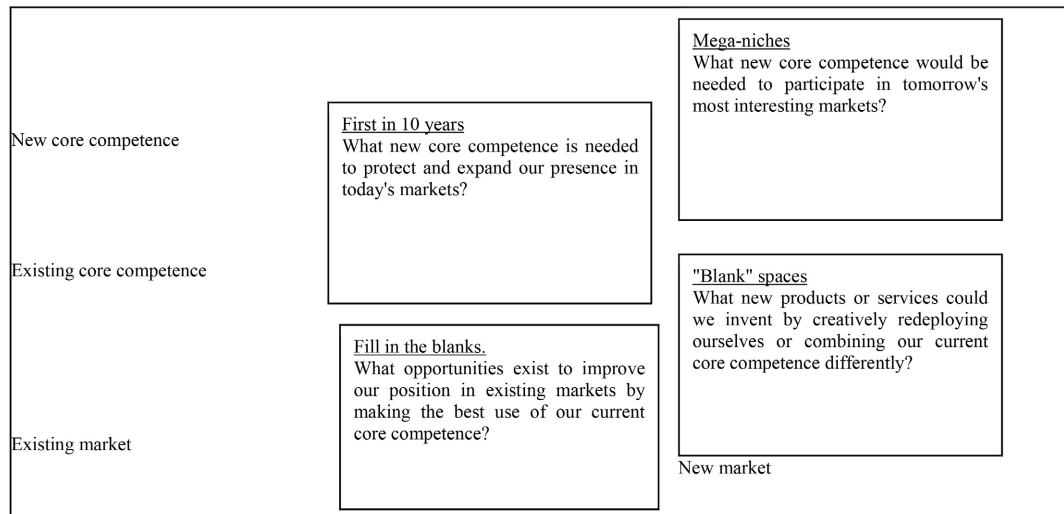


Figure 1. Development of a core competence program. Source: Hamel & Prahalad (1995, p. 240).

South Kivu (PISMEH/S-K), the population of SMEs in the city of Bukavu is 2143 companies that constitute the target population of this study. This study targeted 300 executives and used a two-part survey questionnaire. The first part included closed and open questions relating to the profiles of managers and SMEs. The second part included a multi-item scale on the impacts of ICTs on the different dimensions of competences in SMEs. A Likert-type measurement scale with 5 levels ranging from 1) Strongly disagree; 2) Disagree; 3) Neutral; 4) Agree, and 5) Strongly agree) was used for both variables. Out of a total of 300 questionnaires, regular follow-up resulted in the recovery of 210 questionnaires, representing a non-response rate of 30%. Of the well-completed questionnaires, 195 answered the characteristics of SMEs and were considered as sample individuals whose results were generalized to all SMEs.

3.2. Core Competence Scale

The fundamental competence is a set of 3 dimensions forming the dependent variables of this study. They are all latent or unobservable and have been measured using previous measurement scales strongly inspired by the literature [2]. The measurement scale used in this study includes 12 items grouped into 3 dimensions including the domain of: Productive process with 4 items; Market access process with 4 items and distinctive functional contribution of the product with 2 items. The other two items capture the use of ICTs, which constitute the independent variable.

The process of purifying the scale made it possible to retain all 12 items grouped into 3 dimensions (Production process, market access process and functional contribution). The results of the exploratory factor analysis indicate that the data admit the analysis (KMO = 0.680, Chi-squared = 555.633; P = 0.000). They reveal that the core competence of SMEs is a three-dimensional construct that explains 61,397 percent of the total variance. The reliability test ($\alpha = 0.703$) shows

that there is internal consistency between items and shows that the scale is reliable. The results of confirmatory factor analysis demonstrate good psychometric properties for this scale ($\chi^2 = 75.045$; $P = 0.16$; $\chi^2/df = 1.471$; CFI = 0.92; IFI = 0.92; RMSEA = 0.049; NFI = 0.79; GFI = 0.94; AGFI = 0.91).

The table below (Table 1) provides further information on the items, dimensions, proofs of reliability and validity, and fit indices pertaining to the latent construct.

The results of the Table above reveal that the construct has the AVE between 0.3 and 0.6 and proves that the AVE is within a good limit [38]. Reliability results are also satisfactory (CR > 0.70) [39]. They further show that each variable is statistically related to its latent construct to which it was supposed to be attached. All dimensions relating to the “core competence” construct have a t-value greater than 1.96. These results can be visualized in the diagram below: (Figure 2)

The scale used was subjected to the reliability and validity analysis of the constructs. The table below presents ample information: (Table 2)

Let 0.74 be the value of CR for the construct ICTs AND CORE COMPETENCE. The CR and AVE values found confirm that the convergent validity is adequate for the measure under review [40]. Discriminant validity was attested by comparing the squares of correlations between variables and shared mean variance

Table 1. Exploratory and confirmatory factor analysis table (N = 195).

Description of variables	Structural coefficients (CFA)	CR	AVE
ICTs and CORE COMPETENCE ($\alpha = 0.703$; KMO = 0.680; $\alpha = 0.92$; IFI = 0.92; RMSEA = 0.049; NFI = 0.79; GFI = 0.94; AGFI = 0.91)		0.74	0.54
PRODUCTIVE PROCESS			
Proc_prod 1 facilitate product quality.	0.70		
Proc_prod 2 allow flexibility of tasks.	0.30	0.63	0.31
Proc_prod 3 use brings much than it costs financially.	0.20		
Proc_prod 4 facilitate the speed and timeliness of operations.	0.25		
MARKET ACCESS PROCESS			
Proc_acc 1 facilitate commercialization.	0.64		
Proc_acc 2 enable brand management.	0.38	0.4	0.68
Proc_acc 3 facilitate the implementation of logistics.	0.54		
Proc_acc 4 facilitate product marketing and distribution.	0.32		
DISTINCTIVE FUNCTIONAL CONTRIBUTION OF THE PRODUCT			
Contr_prod 1 distinguish the entity’s service from that of competitors	0.56	0.59	0.60
Contr_prod 2 make the entity special	0.94		

AVE = Average Variance Extracted; CR = Construct Reliability; EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; CFI = Comparative Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation; NFI = Normal Fit Index; GFI = Goodness of Fit Index; AGFI = Adjusted Goodness of Fit Index. Sources: our analyses on the Amos SPSS software.

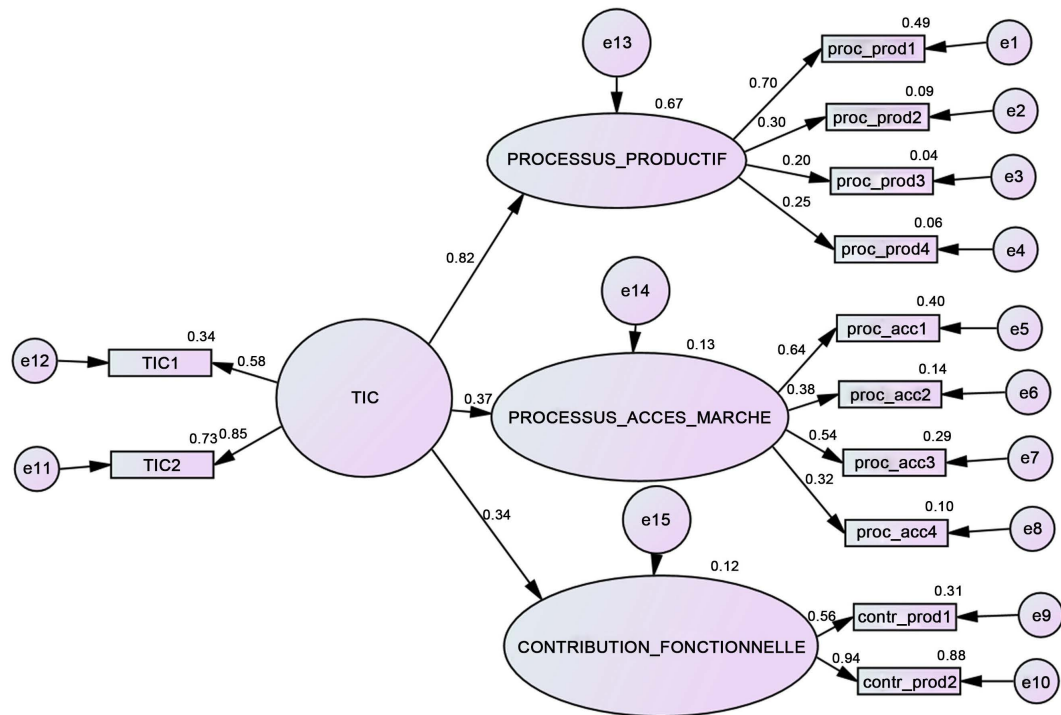


Figure 2. The digrame is in French following the version of the software used. Sources: our analyses on the Amos SPSS software.

Table 2. Summary of information on variable measurement.

Built	Size	Items	Cronbach's Alpha Coefficient	Reliability average (CR) variance extracted(AVE)
ICTs AND COMPETENCE	3	12	0.703	0.740.54

Sources: our analyses on the Amos SPSS software.

[39]. The correlation squares between the variables are less than the relative shared mean variance. These results indicate that the constructs are different from each other and prove that the scale used meets the criteria of discriminant validity. The table below provides ample information (Table 3).

3.3. Data Processing Techniques

Data were processed using flat sorting, exploratory and confirmatory factor analysis. The flat sorting allowed us to describe the behavior of SME managers in the city of Bukavu in the face of different uses of ICTs. This allowed us to understand the importance that these different leaders have given to ICTs for the core competence in their SMEs in a constantly changing environment like that of the Democratic Republic of Congo. Core component factor analysis allowed us to measure and extract the core competence dimensions of PMEFs [41]. The analysis first verified that the constructed data supported factor analysis (KMO > 0.50

Table 3. Correlation matrix between constructs and dimensions.

	ICT dimension PROCES_PROD	PROCES_ACCE	CONTR_FONCT.	AVE
TWITCH	1			0.54
PROCES_PROD	0.318 "0.10" (0.000)**	1		0.31
PROCES_ACCES	0.217 "0.05" (0.002)**	0.156 "0.02" (0.029)*	1	0.68
CONTR_FONCT.	0.202 "0.04" (0.005)**	0.213 "0.05" (0.003)**	0.247 "0.06" (0.001)**	1 "0.60"

With () the probability; "x" is the correlation coefficient square; *: significant at the 5% threshold and **: significant at 1% (Sources: our analyses on the Amos SPSS software).

and Bartlett’s sphericity test with significant Chi-square < 0.05) [42]. The analysis then made it possible to extract the factors (eigenvalue > 1) via an iterative approach by removing items that do not contribute to explaining the constructs using commonality (>0.5) as the main criterion [43]. Varimax rotation has been used to maximize the chance that each variable will be correlated to a single component [41]. The purification process was stopped when a total explained variance of 60% was achieved [40]. Confirmatory analysis was used to confirm the one-dimensionality of each scale by demonstrating that the items and dimensions identified by the exploratory analysis are those that characterize the latent construct [44]. The analysis also made it possible to judge the quality of fit of the measurement and structural models by referring to pre-established indices (Chi-square/df < 2; RMSEA < 0.5; CFI > 0.90; IFI > 0.90; NFI > 0.7; GFI > 0.9, and AGFI > 0.9) [38]. The analysis confirmed that the scales and their dimensions used for ICTs AND CORE COMPETENCE were reliable ($\alpha > 0.70$ and CR > 0.70) and valid (AVE > 50 and $pvc_i \geq \max(r^2 n_i, \eta)$) [45].

In addition, four indicators were used to demonstrate the fit quality of the estimated model: χ^2/df , RMSEA, GFI and CFI [39]. We used the Chi-square/df ratio for which values below 2 showed a good fit. The Root Mean Square Error of Approximation (RMSEA) was used to demonstrate that there are no differences between the variance-covariance matrix of the model under analysis and that of the population [46]. Thus, an RMSEA value < 0.08 was considered evidence of a good fit if it was within the 90% confidence interval [47]. The Comparative Fit Index (CFI) was used to demonstrate that there was a statistical difference between the variance-covariance matrices obtained and the variance-covariance matrix of the base model (weak correlations between variables). We accepted the model for a value greater than or equal to 0.9 [39]. The Goodness of Fit Index (GFI) was used to identify the proportion of information explained by the matrix. We opted for a GFI value greater than or equal to 0.9 for good model quality [45]. In the end, the reliability and validity of the latent construct were established. Reliability has been tested using Cronbach’s alpha coefficients and

Jöreskog's rho [44]. The validity of the latent variables was obtained through convergent and discriminant validities. The mean variance extracted for the construct and dimension was used to test the convergent validity. The latter was confirmed when the dimensions exhibited extracted mean variance (AVE) values > 50 [47]. These results meant that items for each dimension explained it better than they would for other dimensions. Comparison of the mean variance extracted for each dimension with the square of the simple correlation between the dimensions taken two by two was used to test the discriminant validity [48].

3.4. Limitations of the Methodological Approach

The data for this study are derived from a questionnaire survey. Unlike the interview, the questionnaire does not allow the auditor to clarify Some questions, ensure that he or she understands the answers, ask for clarification or explanation of answers, or ensure that the respondent answers all the questions on the form. This is why the non-response rate of 30% was reported.

4. Results and Discussion

4.1. Flat Sorting

The results of **Table 4** below indicate that the average score of the impact of ICTs on the core competence of SMEs in the city of Bukavu was 3.81 (63.60%) and 3.88 (64.60%) respectively for ICT1 and ICT2 noting that SMEs managers in the city of Bukavu consider their level of ICTs use above average. These results support our hypothesis that SMEs in the city of Bukavadopt the use of ICTs to strategically manage competences and join those found in [1] [5] [49].

In addition, the coefficient of concentration (Kurtosis) was negative (-1.062 and -1.120 respectively for ICT1 and ICT2) (**Table 4**) and showed that the opinions of SMEs managers in the city of Bukavu on the importance attached to the adoption of ICTs in their SMEs were divided. The symmetry coefficient was also negative (Skewness = -0.674 and -0.679) indicates that the observations were generally co-Centre towards the highest values [11]. This revealed that SMEs managers in the city of Bukavu attach great importance to ICTs in the management of their enterprisers. In the context of the city of Bukavu, these results could be justified by increased competition for which new marketing strategies that spark technological innovations are needed. These results are consistent with those previously found in [1] which showed that the use of ICTs had a positive impact on the management of the company's skills, especially to face competition.

In addition, this table shows that SMEs managers in the city of Bukavu attached great importance to ICTs in the implementation of the various facets of core competence. The managers' score of importance given to the various elements of competence was above average. All items had a lower dispersion from the central value. No dispersion reached 0.5 (or 50%). The largest of these was that of the items "ICTs facilitate the speed of execution and respect of deadlines

Table 4. Average score of the impact of ICTs on the core competence of SMEs in the city of Bukavu, Democratic Republic of Congo.

Items	N	Average	Typical deviation	CV	Average score in %	Skewness	Kurtosis
Proc_prod 1	195	3.99	1.278	0.32	67.70	-0.798	-0.947
Proc_prod 2	195	3.99	1.364	0.34	68.70	-0.914	-0.756
Proc_prod 3	195	3.83	1.361	0.36	61.50	-0.606	-1.212
Proc_prod 4	195	3.81	1.408	0.37	62.60	-0.679	-1.071
Proc_acc 1	195	3.95	1.321	0.33	66.70	-0.795	-0.922
Proc_acc 2	195	3.86	1.343	0.35	65.10	-0.702	-1.023
Proc_acc 3	195	3.98	1.354	0.34	66.20	-0.830	-0.926
Proc_acc 4	195	3.84	1.412	0.37	64.10	-0.727	-1.025
Contr_prod 1	195	3.79	1.377	0.36	61.00	-0.559	-1.300
Contr_prod 2	195	3.84	1.394	0.36	62.60	-0.650	-1.181
ICT1	195	3.81	1.381	0.36	63.60	-0.674	-1.062
ICT2	195	3.88	1.341	0.35	64.60	-0.679	-1.120

Sources: our analyses on the SPSS.25 software.

of operations (proc_prod4)” and “ICTs facilitate the marketing and distribution of goods and services” which each have 0.37% or 37%. But also, for all items relating to the impact of ICTs on the strategic management of competences in SMEs in the city of Bukavu, the coefficients of concentration (Kurtosis) and those of symmetry (Skewness) were all negative. These had shown compared with the normal distribution that the observations were generally concentrated towards the highest values. This indicates that almost all SMEs managers attached great importance to ICTs for competences management, but managers were divided on this importance. However, it was found that SEMs Managers gave the highest degree of importance to the item relating to ICTS and task flexibility (proc_prod2) with an average tax score of 68.70% for the item. In the context of the city of Bukavu, these results have been partly justified by a recent adoption of ICTS in the management of most enterprises [19].

4.2. Impact of ICTs on Core Competence

The results show that ICTs had a significant and positive impact on all selected dimensions of core competence (Table 5). All dimensions relating to core competence have values above 1.96. These results confirm our hypothesis that ICTs have a positive effect on all three areas of core competence in SMEs in the city of Bukavu in the Democratic Republic of Congo. They indicate that the considered dimensions of competences are greatly facilitated using ICTs chosen by SMEs managers in the city of Bukavu. These results corroborated the results on the use of ICTs obtained in the studies of [1] [19] [50]. And contradict those of [6] who state that there was a small contribution of ICTs in the management of competences.

Table 5. ICT and basic skills in SMEs in the city of Bukavu in the Democratic Republic of Congo.

			Estimator	Stand. Err.	T-Value	P	Label
PROCESSUS_PRODUCTIF	<---	ICTs	0.639	0.104	6.136	***	
PROCESSUS_ACCES_MARCHE	<---	ICTs	0.269	0.085	3.147	0.002	
CONTRIBUTION_FONCTIONNELLE	<---	ICTs	0.230	0.098	2.348	0.019	

Sources: our analyses on the Amos SPSS software.

These results reveal that the management of SMEs in the city of Bukavu use ICTs because the use of ICTs facilitates the quality of service delivery and/or the quality of products, ICTs allow flexibility of tasks, the use of ICTs brings much than it costs financially, ICTs facilitate the speed of execution and respect for the deadlines of operations, ICTs facilitate marketing, ICTs enable brand management, with ICTs logistics become easy to implement, ICTs facilitate the marketing and distribution of goods and services, the use of ICTs makes it possible to distinguish the company's performance from that of its competitors, the firm becomes special from a management point of view thanks to the introduction of ICTs. These results are justified in the context of the city of Bukavu by the fact that the owner-managers of SMEs conceive of ICTs as an innovation from which far too much is expected in the context of management improvement [49].

5. Conclusions, Implications, Limitations and Future Research

The results of the impact of ICTs on core competence in SMEs in the city of Bukavu in DRC confirm that the influence of different uses of technologies is a 12-item construct, 2 of which capture the use of ICTs and 10 others grouped into three dimensions (the productive process, the market access process, and the distinctive functional contribution of the product) capture core competences. They also reveal that SMEs managers attach great importance to the use of ICTs in the strategic management of core competence in their different facets and that their views are divided on the importance given to ICTs in management. The high score of importance given to the use of ICTs by SMEs managers in the city of Bukavu reminds us that efforts must be made to seize the technological innovations available for the better management of competences within SMEs. This aspect will allow SMEs to increase their scale of activity, to become competitive and to be more efficient. The opinions of managers in relation to the importance given to the use of ICTs confirm that they do not have an impact in themselves, but everything depends on the organizational strategies and objectives pursued [1].

Although this study yields convincing results from a scientific point of view, it suffers from two main limitations. First, the scale used is shown on a sample of SMEs with a family majority. A future study measuring the impact of ICTs on the management of all firms regardless of their size, considering their specificities, would make it possible to compare the results and identify the different le-

vels of use and impact between them. Second, the study focused on only one site with a particular characteristic: the city. This could limit the scope and generalization of results. Research targeting both rural and urban SMEs would complement the results of this research. A retrospective study on ICTs and SMEs performance is also envisaged. It would study the influence of ICTs on performance. This will help to focus attention on the costs associated with the use of technology and its contribution to performance (perceived utility).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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