

# **Exploratory Study on the Adoption of Knowledge Management Practices in Small Medium Enterprises in Resource Constrained Areas: A Case Study of the Dairy Industry in Uganda**

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**Keywords:** Knowledge Management (KM), Small Medium Enterprises (SMEs).

**Abstract:** The aim of this paper is to shed light on Knowledge Management (KM) practices in Small Medium enterprises (SMEs) in resource constrained areas. The Paper presents the results of an exploratory study investigating the adoption of KM practices in 66 enterprises across the Dairy industry located in South-western Uganda. The Methodology adopted focused on literature review to gain an in-depth understanding KM in SMEs and insight into the Dairy industry in Uganda, a structured questionnaire was used to collect information from the different stakeholders and an interview guide used to conduct interviews with various stakeholders in the firms. The results show that SMEs are falling behind large companies in developing KM practices; however all the firms showed a significant understanding of the benefits of KM. There is significantly low skills and usage of ICT in SMEs which is essential for successful implementation of KM within an organization. Web browsing, voice and SMS are the most commonly used ICT Services and the least used are ICT professional services like business intelligence tools, ERPs and Dashboards, which creates significant opportunity for development of KM tools suitable for resource constrained areas. Skills gap, informal knowledge and technological barriers were highlighted as significant barriers to implementation of KM. There is limited usage of Decision Support Systems and Data mining tools as KM Tools.

## **1 INTRODUCTION**

Over the past decades, there has been growing interest in the potential contribution of small and medium enterprises (SMEs) to the growth of economies globally (Evangelista, et.al., 2010; Wong & Aspinwall, 2005). SMEs have been a subject of socio-economic interest with the spread of globalization and capitalism (Acs & Kallas, 2008; North & Smallbone, 1996). SMEs are often regarded as the backbone of industrial development and important source of economic growth, innovation and technology transfer (Christine, 2011; Evangelista et al., 2010; GoU-NPA, 2012; Ishengoma & Kappel, 2008; Mourougane, 2012; Ng & Kee, 2012). The contribution of the SME sector to economic growth has been widely acknowledged due to their impact on Gross Domestic Product (GDP), job creation and, socio-economic transformation (Beal, 2003; Chelliah, et.al., 2010;

Gielnik, 2010). Uganda is a member of East African Community (EAC) with a market of over 135 million people with access to the sea (EAC, 2012). In the vision of transforming the society from a peasant to a modern and prosperous country within 30 years, the main focus is the development of private sector driven economy (GoU-NPA, 2015). SME development is a key component of Uganda's economic development agenda as they are also viewed as the prime source of new jobs and hence shall play a crucial role in income generation as well as in industrialization processes of the economy (GoU-NPA, 2015). According to Uganda's vision 2040, it is Uganda's aspiration to achieve the following;

- 4 million operational SMEs,
- SMEs to contribute 40% towards GDP,
- SMEs provide employment to 5 million people,
- SMEs contribute 40% to the export earnings,
- 40% of the SMEs involved in manufacturing activities,

- 50% of SMEs are owned by women,
- 5% of SMEs are involved in agriculture and related services and survival rate of SMEs is at least five years

The European Union (EU) definition for SMEs was introduced by the European commission in April 1996 and classified into three groups including medium, small and microenterprises as detailed below in Table 1. Its definition is based on the number of paid employees, turnover, balance sheet total and independence (Loecher, 2000).

Table 1: Small and Medium Enterprises Classification.

<b>Employee bands</b>	<b>N</b>	<b>%</b>
<b>Micro 0-9</b>	3	12
<b>Small 10-49</b>	10	40
<b>Medium 50-249</b>	11	44
<b>Large &gt;250</b>	1	4
<b>Total</b>	25	100

For the purpose of this research SMEs shall define a small enterprise as one which employs maximum 50 people; annual sales/revenue turnover of maximum 360 million Uganda Shillings (UGX) (approximately United States dollars (USD) 215,000, or Euro (€) 137,000) and total assets of maximum 360 million UGX. A medium enterprise employs more than 50 people with a maximum of 500 people; annual sales/revenue turnover of more than 360 million UGX (approximately USD 215,000, or €137,000) and total assets of more than 360 million UGX (Okello-Obura, 2009; Kasekende & Opondo, 2003; Uganda Investment Authority, 2008).

This paper attempts to present significant opportunities for adoption of KM in SMEs in resource constrained areas and especially Uganda. It provides theory and literature to support the need for knowledge management methods in SMEs in resource constrained areas. It gives background to the importance of industrialization of the Dairy sector in Uganda and with specific emphasis of decision support from a KM perspective.

This paper is organized into 6 (six) main sections. Background to the study is presented in section 2.0. The Materials and methods are presented in Section 3.0, the results are presented in section 4.0 and a detailed discussion of the results is presented in Section 5.0. The conclusion is presented in section 6.0.

## 2 BACKGROUND

### 2.1 ICT and Knowledge Management

Information and Communications Technology (ICT) does play a significant and crucial role in assisting SMEs in creating both business opportunities and combatting competition pressures (Mutula & Van Brakel, 2007). Literature review indicates that the effectiveness and efficiencies of ICT are an essential requirement in supporting KM adoption (Maguire, Koh, & Magrys, 2007; Yew Wong & Aspinwall, 2005). By utilizing tools such as emails, groupware and web browsers, give employees opportunity to share invaluable knowledge thus contributing to the growth of SMEs. SMEs tend to use their ICT independently rather than in an integrated manner. They are not always able to take advantage of methodologies generally developed for large firms.

The KM definitions suggested by (Alavi & Leidner, 2001; Bhatt, 2001; Davenport & Prusak, 1998) have been considered as the working definition for this paper as they refer to KM as the process that can be used to create, collect/capture, organize, refine, disseminate and maintain knowledge and experience generated during their operations, activities, and processes in order to improve organizational performance and enhance decision making and their competitiveness.

The value and importance of knowledge as seen by numerous organisation today, does without a doubt play a crucial role in the current ever-challenging and aggressive business environment (Christine, 2011). Information Technology plus communication Technology are enabling media of the new economy, but its agents are Knowledge Workers. The know-how of such workers is the most valuable property firms have (Giddens, 2013). Organisations should develop strategies based on superior knowledge to obtain a sustainable competitive advantage in today's turbulent market place (Evangelista et al., 2010). To obtain a competitive advantage based on knowledge, organisations have to identify what kind of knowledge is needed and then set out to obtain or create it. Once knowledge is obtained or created the next step is to distribute it throughout the entire organisation so everybody within the organisation has access to the knowledge. ICT plays an important role in the process of knowledge distribution (Pricewaterhousecoopers, 1998).

Information and Communication Technologies provide SMEs with opportunities for KM today which in most cases is largely unexploited. The managerial challenge, then, consists of creating new

KM configurations in terms of technological and organizational tools, leading to organizational models sustainable from the competitive point of view. ICT provide SMEs with opportunities to spur innovation and commercialization in developing countries. According to (Corso et al., 2003), by providing quick and easy access to external sources of knowledge, new ICT can erase traditional constraints on SMEs innovation ability and foster intra/inter- organizational integration. In the area of product innovation (PI) the use of internet based applications, product data management, virtual prototyping, computer aided design (CAD), is expected to substantially reshape the overall KM process.

Emerging literature regarding ICT application in SMEs shows a substantial lack of empirically grounded explanatory models and emphasises SMEs technological lag with regard to ICT tools adoption/implementation, disregarding the role played by contingencies (Corso et al., 2003). In addition, the low level ICT adoption in SMEs is ascribed both to a lack of financial resources and skilled manpower within SMEs.

There has been exponential growth of ICT in resource constrained areas, research reveals that while there is considerable usage of ICT in the areas of data and voice applications there is still a very low level of ICTs utilization in business applications among SMEs (Rufaro et al., 2008) and hence presents significant opportunity for SMEs to implement KM Practices.

## 2.2 SMEs and Knowledge Management

The environment in which businesses operate today, can be summarized in terms of five key trends: globalization and the increasing intensity of competition; changing organizational structures; new worker profiles, preferences and predispositions; advances in information and communication technology; and the rise of knowledge management (Hall & Hall, 2003). Knowledge is at the heart of much of today's global economy and managing knowledge has become vital to companies' success (Kluge, Stein, & Licht, 2001). There is tremendous growth of SME's in resource constrained areas and to survive in the global economy, small and medium enterprises (SME's) have to improve products and processes, exploiting their intellectual capital in a complex network of knowledge-intensive relations inside and outside their boundaries (Evangelista et al., 2010; Mourougane, 2012). The future growth of

industrialization and profitability of SMEs in resource constrained areas will greatly depend upon the competitive quality of the knowledge and how it is identified, shared and used to deliver value to clients(Mchombu, 2009).

Existing literature today focuses on adoption of KM in large companies, SMEs in advanced economies and emerging markets however with very little literature or research has been done in KM on firms in resource constrained environments (Alawneh, Abuali, & Almarabeh, 2009; Evangelista et al., 2010; McAdam & Reid, 2001; Mourougane, 2012; Ng, Kee, & Mui, 2012; Yew Wong & Aspinwall, 2005). In fact, the understanding of the organizational theory and practice considerations of KM has mainly been derived from large company experiences (Evangelista et al., 2010).

The knowledge in SMEs is diverse and its proportions are immense and growing. Owners, managers and staff that work for these organizations have problems keeping track of where this knowledge is, where it is, and who has it. According to (Alavi & Leidner, 2001), in SMEs individual competences usually represent the cornerstone of a firm's knowledge and a key determinant of organizational performance. The increasingly fierce competition deriving from globalization and ICT has challenged this approach calling for new ways to develop, diffuse and retain knowledge in SMEs. Introducing knowledge management systems into an SME is a particular challenge because of they are known for too much implicit knowledge, limited resources, insufficiently shared between owners, managers and other employees. (CN Wee & YK Chua, 2013; Desouza & Awazu, 2006) discuss five key peculiarities that differentiate knowledge management practices in SME's and larger companies (i) in SME's there is lack of explicit knowledge repositories. Instead, each manager/owner acts as the knowledge repository. (ii) Common knowledge possessed by members of the SME's is deep and broad. This common knowledge helps in the organization of work by easing issues of knowledge transfer, sense-making, and application. (iii) SMEs by their nature and due to deliberate mechanisms are skilled at avoiding pitfalls of knowledge loss. The close social ties between members of the SME act as a deterrence against employees leaving the business. In cases where employees do leave the business, there are plenty of available knowledge resources that can be mobilized to quickly fill the void. (iv) SMEs have a knack for exploiting foreign sources of knowledge. Since they are resource constrained, and cannot spend efforts to

create knowledge, they look outside the organization for knowledge. (v) SMEs knowingly or unknowingly, manage knowledge the right way – the humanistic way. Technology is never made part of the knowledge management equation. The use of technology in an SME is mostly limited to acts of automation (such as the use of cash registers) and at times for informative purposes (storing of employee contact information in databases). The basic assumption of KM is that organizations that manage organizational and individual knowledge better will deal more successfully with the challenges of the new business environment (Alawneh et al., 2009). KM is seen as a key factor in realizing and sustaining organizational success for improved efficiency, innovation and competition (Alawneh et al., 2009). Knowledge management is a critical area for small business managers in today's competitive environment (Evangelista et al., 2010).

However, there is a general consensus in relation to the fact that the benefits of KM have not been fully exploited (Evangelista et al., 2010). In particular, the management of knowledge assets may provide small firms new tools, for survival, growth and maintaining a sustainable competitive advantage (Evangelista et al., 2010). Consequently, the potential of KM seems not fully exploited by small firms and this is reflected in a literature void where little research contributions on this topic have been published (Evangelista et al., 2010).

### 2.3 Overview of the Dairy Sector in Uganda

Agriculture has been and remains central to Uganda's economic growth, food security and poverty reduction (Balikowa, 2011; Mbowa, Shinyekwa, & Lwanga, 2012). It is a major source of raw materials for the manufacturing sector, a market for non-agricultural output and a source of surplus for investment (GoU-NPA, 2015).

Dairy industry is an integral part of the agricultural system of most parts of Uganda. Dairy development has received the greatest attention in the development of the animal industry in Uganda (MTTI, 2007). Over the last ten years, Uganda's dairy industry has witnessed tremendous improvement as a result of the numerous public and private sector led development interventions, including implementation of reforms aimed at improving the quality of milk and enhancing market access (Balikowa, 2011). The evidence of the above is based on statistics of annual milk production in Uganda which is estimated at 1,504 Million Litres

(UBOS, 2014) and shows a steady increment as seen in the figure 1.

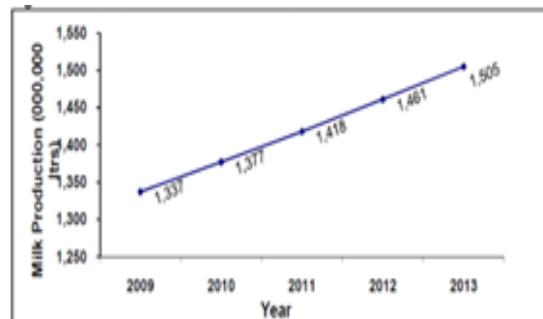


Figure 1: Milk production in Uganda. Source is the Uganda Bureau of Statistics - Statistical Abstract of 2014 Census.

The largest and probably the most important category of Dairy industry players are the farmers. The private sector is currently the key player in development of Uganda's Dairy industry. It is responsible for development of infrastructure for milk transport, bulking and processing. In addition, it employs many people who are engaged in various economic activities along the Dairy value chain, particularly in milk production, collection, bulking and transportation, processing, distribution and marketing as well as provision of advisory and business development services particularly animal health, breeding, farmer training and financial support services (Balikowa, 2011). The Small medium enterprises in the Dairy Sector which include Medium and large-scale Dairy Farmers, Milk Collection Centres (Vendors), Cooperatives and small-scale processing plants are currently the key players with potential to influence the growth of industrial development of Uganda's Dairy industry and account for 92% of the actors in the Dairy Value Chain.

## 3 MATERIALS AND METHODS

Based on the discussion so far, we can state that the motivation to carry out the research is because the above theoretical research represents significant opportunity for knowledge management support for decision making in the areas of productivity improvement, continued expansion, industrialization and innovation of market-oriented smallholder Dairy production which will eventually give rise to small medium enterprises. An exploratory research was conducted using a questionnaire survey. The aim of the study was to investigate the status of adoption of

Knowledge Management Practices as a Strategy for growth and overall business competitiveness in SMEs in resource constrained areas. Investigating the adoption of KM practices in 66 enterprises across the Dairy Industry located in the same geographic area in South-western Uganda. Uganda is divided into six milk sheds based on the differences in geographical agro ecological characteristics, market dynamics and cattle population as shown in Figure 2.

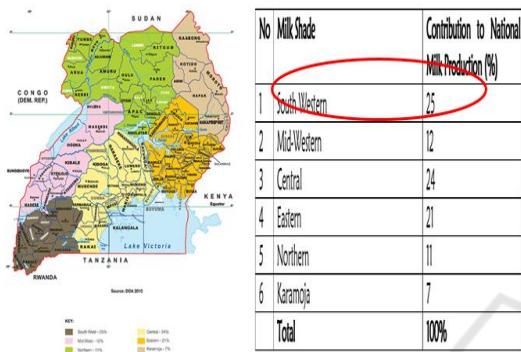


Figure 2: Uganda's Milk Sheds.

### 3.1 Study Design and Setting

#### 3.1.1 Data Collection

We conducted a population-based cross-sectional survey at 66 enterprises across the dairy industry in South-western Uganda between March and April 2018 using a semi-structured questionnaire developed in English. For comparison and contrast, 7 (Seven) of the enterprises investigated where large scale dairy processing plants in South Western Uganda. The questionnaire was administered by trained research assistants. The questionnaire captured data on respondent's demographic information, organization's demographic information, respondent knowledge on KM practices in the enterprise, tools for KM implementation, benefits of KM in the enterprise and KM implementation barriers.

#### 3.1.2 Sample Size

Sample size was calculated using Kish Leslie formula (Kish, 1965). The prevalence of knowledge about KM practices, tools, benefits and barriers was estimated at 50%. The calculated sample size of 178 was based on the estimated 50% prevalence, standard deviation of 1.94 at 95% confidence interval and a relative precision of 20% and a 15% nonresponse rate.

#### 3.1.3 Study Sample

Data was collected from 66 Dairy firms across the Dairy Industry located in South-western Uganda, which included Large Scale Farmers (LSF), Milk Bulk Collection Centres (MBCC), Secondary Cooperatives (SC) and Small Scale Processors (SSP). For comparison and contrast, 7(Seven) of the firms in the same Industry and same area, investigated where Medium Scale Processors (MSP) and Large Scale Dairy processing plants (LSP) as shown in Table 2 which are all categories of Small Medium Enterprises (SMEs). Only firms that were registered with DDA were included in the study.

Table 2: Study survey participants (LSF-Large Scale Farmers, MBCC-Milk Bulk Collection Centres, SC-Secondary Cooperatives, SSP-Small Scale Processors, MSP-Medium Scale Processors, LSP-Large Scale Processors.

Firm Category	No. Firms	No. of Respondents	Total No. Of Respondents
LSF	20	2	40
MBCC	6	3	18
SC	14	3	42
SSP	19	3	57
MSP	3	3	9
LSP	4	3	12
<b>Total</b>	<b>66</b>	<b>17</b>	<b>178</b>

#### 3.1.4 Data Analysis

Data from the questionnaires was coded and entered into SPSS and analysed using STATA version 13.0 (Stata Corp, Texas, USA) statistical software. The outcome variables are knowledge creation, knowledge transfer, knowledge sharing, knowledge utilization, ICT, organization culture, organization leadership, organizational structure and human resource. The independent variables included the respondents' demographic factors. Descriptive statistics and correlation coefficient tests were carried out to investigate the correlation between each of the different independent variables and the outcome variable.

#### 3.1.5 Ethical Consideration

The study was conducted according to the principles of Mbarara University Research Ethics Committee (MUREC) and Uganda National Council for Science and Technology (UNCST) which all approved the study.

## 4 RESULTS

### 4.1 ICT Usage Skills

The survey indicated that the vast majority of the sample respondents (38.2%) were moderate in ICT usage skills, 32.3 % were good, 27.8% were low and 15.6 % were proficient as shown in Figure 3. The highest level of ICT usage skills was in large scale processors where 83.3% of the respondents were proficient. ICT Infrastructure and skills are critical to KM Implementation.

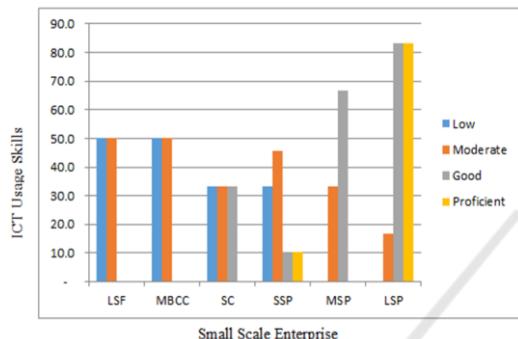


Figure 3: ICT usage skills among the different categories of SMEs.

Results from the comparative study in two different settings showed that the usage skills among the different categories of SMEs are in agreement as shown in Table 3.

Table 3: ICT usage skills among the different categories of SMEs between two settings.

Group	Setting 1	Setting 2
Mean	4.700	4.600
Standard Deviation	0.2102	0.2092

The two-tailed P value equals 0.4814. By conventional criteria, this difference is considered to be not statistically significant.

### 4.2 ICT Services

It was also noted that most of the firms (95.7%) use a number of ICT services like Email, Web Browsing, VOICE, SMS and ICT professional services with VOICE (91.7%), SMS (91.7%) and browsing (53.8) being the mostly used services by all firms. This creates an opportunity for designing methods based on SMs, browsers and reporting. The least used services are the ICT professional services

like business intelligence tools, ERPs, Dashboards, online support and chats are only used by large scale processors as shown in Figure 4.

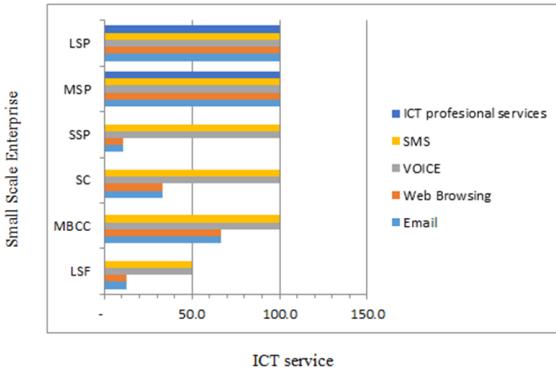


Figure 4: ICT Services among the different categories of SMEs.

### 4.3 KM Implementation Tools

The study indicated that all the 66 firms adopted KM practices to some extent with the highest adoption of KM practices by Large Scale Processors and least adopted by Large Scale Farmers. All the large scale processors (100%) use the KM tools which include Work team, ERPs, Internet Site, Mailing and Newsletter, however with limited use of Decision Support Systems, Data Mining and Document Management Systems as shown in Figure 5. The importance of KM tools support enterprises to acquire valuable information and support them in decision making in order to improve business performance. None of the Large Scale Firms, Milk Bulk Collection Centres, Secondary Cooperatives and Small Scale Processors use KM for data mining and document management. There is need to

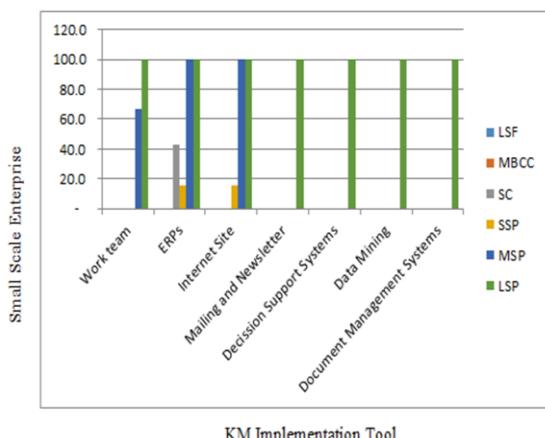


Figure 5: KM Implementation tools among the different categories of SMEs.

develop effective Methods that can support the decision enhancement process.

#### 4.4 Barriers to KM

Skills Gap, informal knowledge and technological barriers were highlighted as significant barriers to implementation of knowledge management as shown in Figure 6.

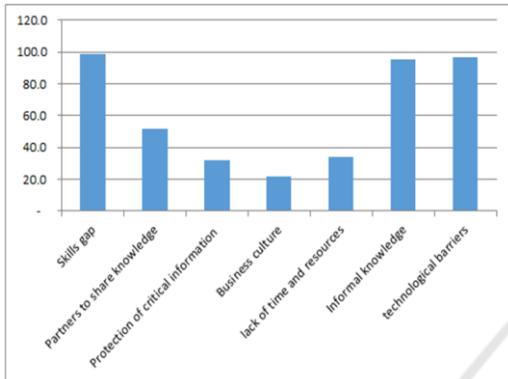


Figure 6: Barriers to KM Implementation in SMEs.

## 5 DISCUSSION

Despite increased access to ICT infrastructure in the country, the usage of KM Tools is still low and unclear in SMEs especially in small scale firms as shown in Figure 3. ICT Infrastructure and skills are critical to KM implementation, hence significantly low ICT skills account for the low levels of implementation of KM Methods in SMEs in resource constrained areas.

Based on this exploratory study, the results show that KM ranks as one of the five critical factors that are affecting the growth of SMEs in addition to, access to finance, access to technology, low levels of productivity, and skills levels within the workforce

Knowledge in SMEs in resource constrained areas is largely implicit and is stored in people's memories, activities and is expressed and communicated orally and this poses a serious threat to its preservation and hence global competitiveness and survival (Walugembe, 2010). This is also shown in figure 4 where ICT services are not well adopted in small medium firms. The future growth of industrialization and profitability of SMEs in resource constrained areas will greatly depend upon the competitive quality of the knowledge and how it is identified, shared and used to deliver value to clients (Holsapple, 2001). Knowledge about key

functions in the SMEs business and organisational structures specifically relating to Finance, Sales and Production Function is essential, because they can indicate important trends and alert on to anomalies and dangers (Korczak, Dudycz, & Dyczkowski, 2013). Effectively and proactively capturing the dynamic customer demands and reorganizing its production processes and structure to meet these demands are key attributes of successful manufacturing enterprises. Such performance metrics reflect the overall productivity of an organization. In addition, innovation in product development and customer service entails an enhanced emphasis on the management of knowledge. Literature shows that decision makers in SMEs often don't have a solid knowledge base of business processes and more so for production management and operation efficiency monitoring, and largely because the technology and human resource expertise is either not available or too expensive and most SMEs cannot afford these types of facilities (Wong, 2005). This is also shown in figure 6 as barriers to KM implementation. In these conditions, SMEs decision makers often act intuitively and as a result, the rationality of their decisions is decidedly smaller. The implementation of a KM dashboard can facilitate monitoring of business process performance metrics and in addition as a valuable insight for companies through exchanging information among different parties.

## 6 CONCLUSION

The aim of this paper is to shed light on KM practices in SMEs in resource constrained areas and hence the results of this would help SMEs Managers better understand KM as a discipline and champion its implementation in the companies

The conclusion is that this represents significant opportunity for knowledge management to enhance decision making in SMEs in resource constrained areas. Technology should not only be seen as absolute answer to KM since it's just a tool the long-term competitiveness of SME's in the Dairy Sector in Uganda as a resource constrained areas is also affected by Low Levels of Productivity, Quality Control and technological gaps and skills levels within the workforce.

The findings may be used as a recommendation to SMEs in resources constrained areas that are keen in accepting and adopting KM in their daily operations. Furthermore, this study may also serve as a basis for gathering requirements and support

academics and practitioners to build models for KM that would enhance decision support.

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