

# A Theoretical Framework for Improving Information Management in Small and Medium-Sized Enterprises: The Case of Uganda

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**Abstract**—Information is seen to be an important resource for any organization. This has led many organizations to manage it carefully with progression from origination to disposal. The study on information management in SMEs reflected the key defects that may be responsible for consistent unavailability of information in these firms. It was realized that many SMEs seemed to have not considered information as a resource to their businesses and hence weak procedures were mainly employed to foster the above. The study followed a multiple case study approach across firms from two sectors of the Ugandan economy. Firms in the real estate and advertising service depicted better approaches to information management as opposed to those from the trade sector. This study sought to explicitly express the underlying issues in information management in SMEs as well as discuss a way forward.

**Index Terms**—Information, information management (IM), small and medium sized enterprises (SMEs).

## I. INTRODUCTION

The unceasing flop of SMEs in Uganda is ascribed to the unavailability of information in these firms to support operations and access to financing according to studies from [1]-[4]. SMEs' failure has incessantly emerged as an issue and it is attributed to a wide range of factors where the above issue is dominant among them. The SME approach to information management seems to have a major impact on information availability in these enterprises. Reference [5] and [6] show that poor record keeping is inherent in SMEs although [7] suggested that just like every other asset in the organization, information needs to be managed. Many of the shown studies have not explicitly shown the loopholes in record keeping in these firms.

Information management ranges from information gathering through processing, usage, storage and share, retrieval and disposal. The above ranges to the processes and technology used to pursue it as shown by [8]. SMEs may not be aware of this or may be incompetently or partially handling the process. The process and its output have continued to prove their great importance to the running and survival of a business if they are managed appropriately. Reference [9] reflects most organizations realize the impact of not managing their information after profit reduction and loss of market share to competitors.

Such occurrences would definitely not be healthy to the sustainability of business especially small and medium sized enterprises which are regarded to be businesses in their infancy. Like the above, [10] and [11] showed that without information management an organization cannot be in position to improve efficiency, compliance with regulations, and increased access to information in an organization which is believed to promote better decision making, cost reduction, maximization of profits among others.

Reference [12] affirms that the work of managers in SMEs is very information-intensive and the environment in which it is done is very information rich. It is therefore true that information is running in the daily operations of SMEs and is of great importance to these firms. Reference [12] concludes by showing that companies which manage information strategically can radically alter the competitive potential of their business and therefore become successful. Like [13] emphasize, it is imperative that SMEs are guided so as to generate the right information to the right person at the time required to make the right decision. With the right approaches, purpose and mechanism SMEs may be able elevate their current status in information management so as to drive for efficiency and sustainable availability of business information in these firms as reflects [7]. SMEs hence need to understand their deficiencies in information management and the desirable way forward so that information availability is enabled and sustained as on way to build their competitiveness in their economy. Reference [10], [14]-[16] confirm to the above.

Managing enterprise information is not a single technology or component but a framework of disciplines for information management across the enterprise [17]. In relation to this we found that some frameworks or models have been generated to reflect the appropriate flow of information management processes. However they were not reflective or situation specific given the characteristics and special needs of Small and Medium sized Enterprises. Reference [17] further stresses that information management components vary across organizations due to the varying requirements, size, means and experience of the organizations. References [15], [18]-[20] have provided frameworks in a more generic approach than organization exclusive approach.

## II. PROBLEM

There is an increase in the amount of information being captured by business organizations according to [12], [15] and [21]. This builds an insight on the fact that improving

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the availability and flow of this information in an organization is vital although [17] informs that support environments are needed but determining the starting point can be very difficult. So as the amount of information grows it is more imperative that the enterprise draws appropriate procedures that can drive for sustainable information availability in these firms. However SMEs in Uganda seem to persistently fail to achieve the above as [3], [5] and [22] have shown that SMEs in Uganda have constantly failed to manage and avail their business information. The gist of the matter may lie in the flow of their organizational procedures as regards to information management or there could be many other underlying factors that point to this.

### III. LITERATURE REVIEW

An information management framework provides a policy direction, standards and best practices required to ensure that information management meets organizational requirements [23]. As many studies provide a way to handle business information, they seem to concur on the need of a procedural format for any organization to manage its information. Such studies include; [10], [13], [15], [17]-[20], [24]-[27]. The components that have been highlighted by the above include: planning [18]; quality and availability [15],

[17] and [19]; use of IS/IT [10], [24]-[27]; managing creation, use and retrieval [10], [13], [15], [20], [25]; security management [15], [17], [19], [20]; managing information discard [13], [15] and [20]

Although many studies have agreed on most components in information management, no one framework or model has provided a comprehensive and exclusively defined framework for SMEs which are regarded as businesses developments in their infancy. Reference [17] informs that the intensity of any of the components varies with organization size and requirements.

On the other hand, [17] suggests that full organizational commitment to managing information as an enterprise asset requires the establishment of enterprise policies and the development of a support environment shared by the organization to manage information although determining what it means and how to get started can be very difficult. On the same aspect [28] had found that there are aids to information management like technologies, methodologies, and development tools, but, useful as these are, they must be subservient to the organizational information strategy and policy.

The above studies reflected on the fact that much as information management follows almost an automatic flow expressed by the information lifecycle, it needs to be conducted in a supportive environment for enhanced benefit.

TABLE I: COMPARISON OF PREVIOUS STUDIES ON INFORMATION MANAGEMENT

	Vodáček (1998)	Maes (1999)	Information management infokits (2007)	Andersen and Mandich (2007)	Jennings (2007)	McGilvray (2008)	COA Paper (2009)	Blumenthal (2009)
Adopt some Information Life cycle stages like; create, use, store and maintain, update, archive and retention, and dispose	×	×	✓	✓	✓	✓	✓	✓
Comprehensive coverage for information managed	×	×	×	×	×	×	×	✓
Information Management Planning	×	✓	×	×	×	✓	×	×
Implement plans and policies for information management	×	×	×	×	×	×	×	×
Evaluate/monitor plans and policies	×	×	×	×	×	×	×	×
Identify and manage loopholes exhibited in the IM process	×	×	×	×	×	×	×	×
Build capacity in information management through training	×	×	×	×	×	×	×	×
Build capacity in information management through IT/IS	✓	✓	×	×	×	×	✓	×
Develop corporate information management culture	×	×	×	×	×	×	×	×

### IV. METHODOLOGY

A mixed methods research design was used following an inductive research strategy. Case study approach on various SMEs was used to generate data and elucidate finding on the loopholes in information management in SMEs. The approach was used with the aim of identifying similarities

and patterns in the information management processes in different business firms. Quantitative data was primarily collected. The qualitative data was simultaneously collected and used to build on the quantitative data as [29] testified that the qualitative findings often provide an insightful perspective.

From [30] we derived the population size for this study to

be 13,096 businesses operating in the trade sector and real estate and advertising service sector. A simplified formula by Yamane (1967:886) as presented by [31] was employed to calculate and derive the study sample. A sample size of 293 firms was derived. Stratified sampling with purpose, judgement and convenience was used to select representative firms from the study sectors. Structured self administered questionnaires, participant's observation and literature review were used as tools for data collection. 184 and 57 responses were obtained from the trade sector and real estate and advertising service sector respectively. Data was collected to determine the requirements for information management as well as to evaluate the framework. Data was analyzed basing on interpretational analysis and frequency analysis as appropriate. Factor analysis was used as the technique for dimension reduction to extract the components (requirements) for information management.

## V. RESULTS

We studied the kind of information of gathered by SMEs in attempt to appreciate the comprehensiveness in coverage of information availed and used to run business operations in these firms. Results depicted insufficient information gathering in SMEs. Major emphasis on capture of information is on sales, profit and stock. SMEs in the trade sector have not seen importance in gathering information on suppliers, customers and market, competition and sector trends, procurement and supplies and human resources while many SMEs operating in real estate and advertising service have no regard for information on procurement and supplies mainly.

A number of factors were studied in relation to inhibiting sustainable information availability in SMEs and a number of responses were generated. Responses generated from both sectors showed that the major hindrances as; lack of training and skills development in IM where lack of a corporate culture towards IM, lack of IM plan and policy, where in the few enterprises with these plans and policies, their information managers do not understand their firms' policies to IM, information security, access control, back up and disaster recovery are compromised probably by limited use of information technologies in these firms.

The firms were further studied in relation to adherence to the stages of the information lifecycle. Responses from both sectors showed major reliance on information capture (obtain) and information use and re-use. Many SMEs showed no consideration to the following components of IM; planning, storage and update, access and retrieval, and archiving and retention, and disposal. This was majorly true for firms operating in the trade sector as compared to those in the real estate and advertising service sector. For instance results showed that for firms operating in the trade sector of the country, 41.8% and 15.8% do not plan for information management and are not sure if they actually plan for it respectively. 54.8% of these enterprises do not manage their information storage, 53.2% do not update information in storage, 60.3% do not manage or control information access and retrieval, 64.1% are not archiving information and 80.4

% do not manage information storage. There seem to be scores of pitfalls in the information management processes of many small sized enterprises hence rendering them incapable of managing, retaining and availing their business information. We may hence say that SMEs especially in the trade sector have adopted a disjointed information management process where many levels of the process are ignored plus the numerous support factors that can boost the success of the process.

In factor analysis with principal component analysis extraction method and 3 iterations with Varimax rotation method; we conducted tests on studied the success factors for information management, ran a correlation matrix, extracted factors, rotated factors and generated conclusions from the output. The analysis from real estate and advertising service sector illustrated a link between having an information management policy and having an information management training program, using information technologies and building an enterprise culture that supports information management. Results from trade sector revealed a substantial correlation between having an information management policy and using information technology, an enterprise culture that supports information management and planning for information management. We extract two components; where one extracted; having information management policy, using information technologies, and planning for information management. The second component extracted; having information management training program and enterprise culture supports information management. The components explained 91.943% of the total variance in the variables which are included on the components.

## VI. THEORETICAL FRAMEWORK FOR IMPROVED INFORMATION MANAGEMENT IN SMEs

The study adopted notations from Unified Modeling Language (UML) Use Case to represent the actors against the information management requirements that were extracted from the study. The notations were used to provide an extended view on the requirements for improving information management in these enterprises. The generated Use Case was extended into the development of the framework.

The requirements were envisaged to the appropriate role players in the information management of SMEs as presented in the use case. From the matters that arose, it emerged as imperative that SMEs formulate and implement an information management policy and plan to provide a baseline for working with information in their enterprises. It would be important that in policy and plan formulation, these enterprises embark on a more comprehensive approach than the limited scope that was depicted in the results. This would enable enrichment of their information resource and better inform their decisions. In building capacity we derived that SMEs need to initiate formalised IM training through implementing and evaluating their IM training program. SMEs especially those in the trade sector are reluctant to acquiring technology as an option for IM improvement although many studies show that IT and IS are the best means to conquer business value. Given their financial state, SMEs will need to make selection of

affordable technology options that best suit their IM needs if they are to enable improved information management and availability. The evolution of such practice in these enterprises would eventually manifest as a culture as expressed by [32].

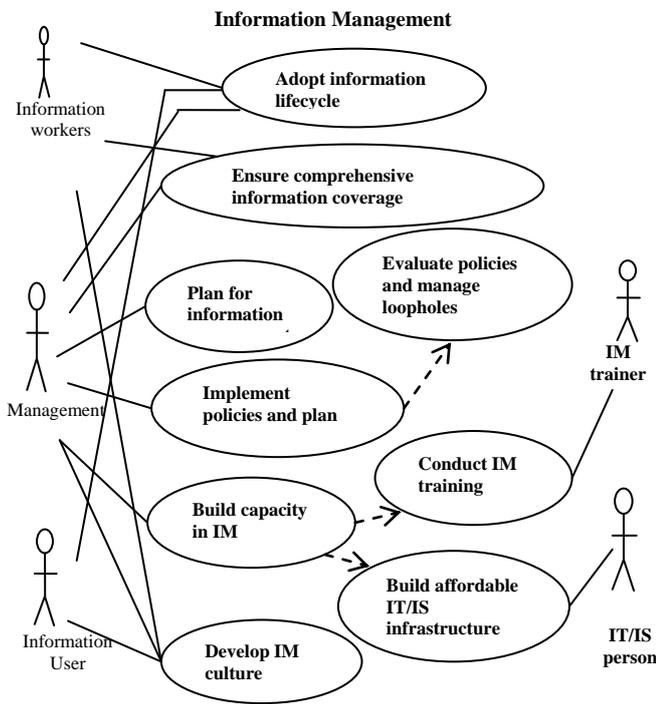


Fig. 1. Use case diagram for information management.

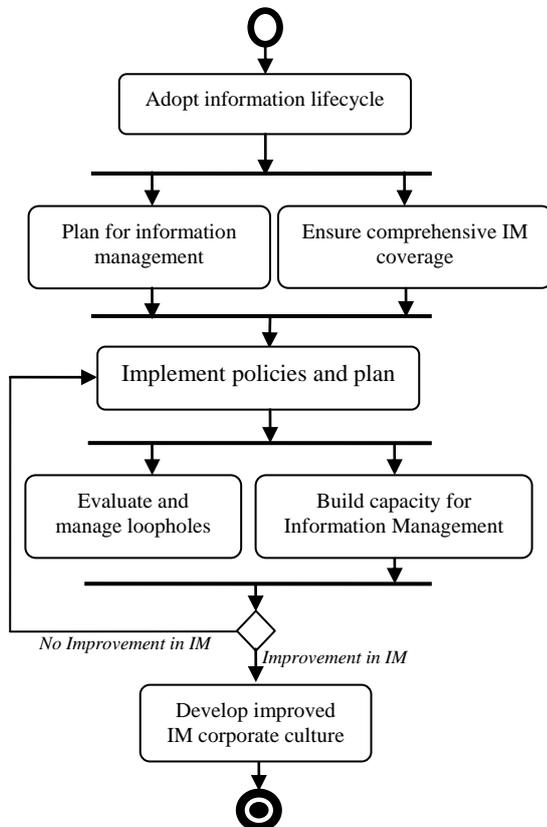


Fig. 2. Activity diagram for information management.

The flow in the requirements for information management was expressed with the use of notations provided by UML activity diagram which arrangement aggregated into the

categorization of the extracted results in the framework. SMEs need to identify and understand the problems in their information management so as to be able to solve them. It is prudent that these firms adopt the full rotation of the information lifecycle as a ground platform for their information management. From the results, the few stages that have been adopted have proved ineffective and hence posed challenges to the practice. With the adoption of more stages of the information lifecycle, more challenges may be posed. It is further desirable that these challenges be identified and overcome so as to achieve the intended progression through the cycle. It may therefore be important that they build capacity in terms of support training to improve information management skills and building affordable information technology or/and information systems (IT/IS) usage to better enable their processes. The framework for information management may assist in registering an improvement in the practice as well as enabling sustainable information availability in these enterprises.

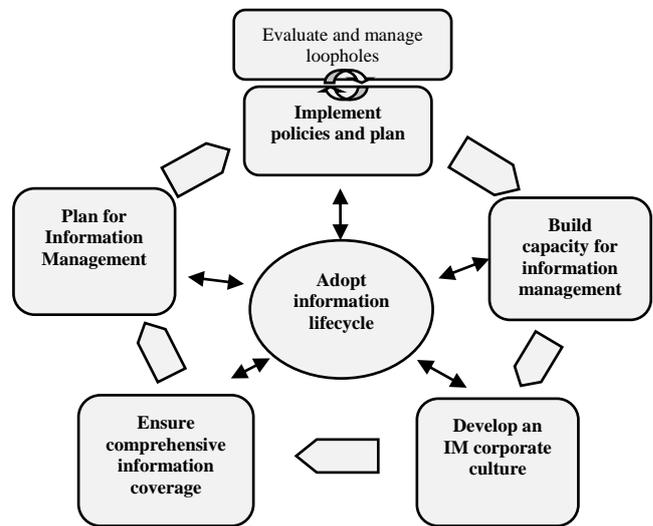


Fig. 3. A framework for information management in SMEs.

A. Adopt the Information Life Cycle

This aspect surfaced as a major challenge posed to the entire field of IM. It was found that most SMEs are concentrating on information capture and use. Many have ignored planning, storage and disposal as other important aspects in IM. SMEs will need to plan and undertake all phases of the information life cycle in order for their information to be managed effectively and ensure its continued availability.

B. Undertake Comprehensive Information Coverage

We found that SMEs have concentrated on managing information on sales, profits, stock and costs while ignoring information on suppliers, customers and markets, competitors, sector trends and practices etc that are also important to the running of their businesses. This mostly applies to the trade sector SMEs. As a requirement for improving IM these enterprises need to develop a comprehensive information assets list to cub all types of information and their handling.

### *C. Plan for IM*

Information management planning may undertake a lot of considerations which cover the entire field of IM. In most SMEs information planning is shown to be focused on information capture while ignoring other factors that promote sustainable information availability in these firms, henceforth SMEs may need to consider cross cutting rationale for IM, standardised procedure for IM and back up.

### *D. Implement an IM Policy*

It was shown that only a few SMEs from both sectors have endeavoured to implement an IM policy while very few remember to review the policy to suite the changing needs of their business environment. It is an important requirement for these enterprises to create, implement, review and amend their IM policies so as to clearly streamline the process.

### *E. Build Capacity in IM Skills*

Information management training program for information managers need to be institutionalised since they depicted limitation in their ability to apply their knowledge to IM which is mainly acquired through observation and from colleagues as reflected in the study. Many have no organised training that has been provided. The training may be specifically tailored for IM planning, information storage, access and security and information disposal. Many respondents had showed that they are unable to apply their IM knowledge in the above areas.

### *F. Build Capacity in Terms of IT/IS Solutions*

Usage of computing software in terms of IT/IS as major tool for IM like [8], [33] and many other scholars have revealed. From the study we saw that the most popular tools for information capture and storage in SMEs are receipt books, counter books and papers as opposed to using computing software which can improve efficiency. SMEs may need to adapt to the usage of database management systems for information storage rather than application based storage. It is imperative that better technologies for information storage like network attached storage, cloud computing may be used by SMEs so as to pave way for increased sharing as opposed to using direct attached storages as the results had revealed.

Further still, SMEs need to become accustomed to using customised technology rather than generalised software. The need to deploy new technology solutions encompasses all organisations despite the size as emphasised by [8]. SMEs need to deploy specific IM programs like document management, records management, collaboration and enterprise search etc. The few SMEs that have deployed IT/IS have only considered using transaction processing systems.

### *G. Build a Corporate IM Culture*

SMEs especially those in the trade sector will need to develop a continued mindset towards the value of information and the importance of managing this information appropriately. We saw that many respondents disagreed to the fact that their enterprise culture supported IM. A positive corporate culture towards IM is important in

improving efficiency. Corporate culture as stated by [34] should originate from top management and that it has an impact on employee morale and productivity. A business is likely to blend into the background and fail to stand out to potential customers, collaborative business partners and employees according to [35] when a proper culture is not built as [32] shows that information culture is reflected in the organization's values and practices with regard to the management and use of their information. SMEs ought to build a positive improvement in culture towards IM as a step towards improved and sustainable information availability. IM culture has emerged as a requirement that enterprise need to value as a consistent need for enterprise information to be managed appropriately.

## VII. FRAMEWORK EVALUATION

With a sample of 89 evaluators from SMEs as well as academia, the framework was evaluated with an evaluation questionnaire which collected data on the suitability of the framework. Evaluation was done to: establish whether the extracted requirements for improved IM were appropriate, establish whether the arrangement and sequence of the requirements was appropriate, establish whether the framework at large would improve IM and availability, and ensure that the general manifestation of the framework was acquiescent as a possible solution and procedure towards improved IM in these firms. Evaluation findings provided that enhancing support factors within the information lifecycle and progression through the extracted requirements for IM as reflected on the framework would help improve IM as well as information availability in SMEs of Uganda although 5.3% of the evaluators were not sure if the provided progression through the requirements for IM as on the framework would improve information availability in these enterprises. In regard to the ease of understanding and adoption of the framework, the finding revealed that many agreed to these. A reliability test on the evaluation items was conducted. The findings revealed .882 Cronbach's Alpha. The findings led to a conclusion that the designed framework for improved IM in SMEs of Uganda would to a great extent yield the expectations. The evaluation analyses provided strong support for the framework in terms of composition, adaptability and ability to create a turning point in the practices of these firms.

## VIII. CONCLUSION

This study adds to contemporary research by suggesting a more informed approach to enabling information management. As many scholars have discussed information management, a combined approach that could stand out as beneficial in accordance to the characteristics of SMEs in developing countries could not be singled out. Our results confirmed that the IM practices in SMEs of Uganda are still inadequate. For most SMEs, a partial understanding of IM is revealed. It is understood as information capture and information use with little regard to various categories of information that need to be managed, the appropriate procedure plus the supporting factors that provide an

enabling platform to improving the practice. We proposed that SMEs consider a more comprehensive approach to IM with regard to IM planning, capacity building in skills and usage of affordable information technology solutions and adherence to the information lifecycle. This could be guided with the generated framework which has been regarded as a probable solution for improving IM and information availability in SMEs.

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