CARD International Journal of Science and Advanced Innovative Research (IJSAIR)
ISSN: 2536-7315 (Print) 2536-7323 (Online)
Volume 2, Number 4, December 2017
http://www.casirmediapublishing.com

Modelling Information Architecture to Enhance the Productivity of SMEs Performance in Nigeria

Mustapha Ibrahim[1], David Oladipo[2] & Saleh Umar[3]

[1&2] Department of Computer Science, Federal Polytechnic, Damaturu, Yobe State
[3]Department of Science Laboratory Technology, Federal Polytechnic, Damaturu, Yobe State
Email: mustee2004@yahoo.com, babakhalil2012@gmail.com
Corresponding Author: Mustapha Ibrahim

ABSTRACT

This research analyses the degree of influence that the use of information management and information technology has on the organizational performance in terms of competitiveness, innovation, and productivity of the small and medium-sized enterprises in Nigeria. Most of the enterprises view IT technologies as instruments to gain certain advantages and many of the times as tools to bring about a change in the business strategies and the institutional corporate processes. it has also been noticed that the promises of it have not been fulfilled, and the so-called productivity paradox has been called into question, especially due to the big investment made by organizations in computers and technology hoping to obtain a substantial profit. Organization suffer from quite number of problems which result to the ways in which business is been conducted. However, among the problems facing the conduct of business in organization is the process of creating sustainable information Architecture. Lack of standardization is also a problem due to instability of technology that changes easily at any time. Considering the occurrences, developing enterprises information Architecture becomes a main concern that needed to address the issues. To build informational architecture for SMEs it is quite useful to identify the problems associate with it and provide a solution that is directly link to the problem. The assertion has been argued by many scholars in the field of Information Architecture (IA) and further added that it is a useful tool to solve a problem that is identified within an organization.

Keywords: Information Architecture, SMEs, IT, Modelling, Organization

INTRODUCTION

Information architectures show a strategic role in enabling the efficient and effective storage, retrieval, and analysis of data in enterprise information systems. An information architecture formation those not consists of data along but has commercial products that can be stored off the shelf (Castelao *et al.*, 2014). However, it also provides correct information using accurate format, to the right person, at the right time, and to secure the information from unauthorized

access. In addition, Castelao *et al.*, (2014) argued that to information can be discriminated and secured only with use of robust information architecture strategy. However, the in light of this assertion, it is essential for establishment of data warehousing managers, governance boards, and metrics to sustenance the procedures that define sequences of information services that is use to access the stored information.

The most vital issue in the development of IT project within an organisation is information system Architecture. The statement is also in agreement with Guetat and Dakhli (2015) which argued that the highest-level map of an organisational information requirement is an Information Architecture (IA). Moreover, these is due to the amazing rate of growth of information technology (IT) and the trend of commerce process and reengineering of business. Consequently, in the information age, cross-functional business processes are no longer supported by monolithic computer systems. Organizations are looking for prospects to exploit new IT to burst their goals and redesign business processes, in office automation, imaging documentation, networks, and client-server technology (Castelao *et al.*, 2014). The architectural level of analysis and design of the enterprises is imperative in evaluating the business, technology, and information communication strategy needed within an organization.

The Concept Information Architecture

Nowadays, information based has been increased within enterprises which make them to achieve their goals and improved information activities as a priority among its set objectives. However, Castelao *et al.*, (2014) are of the view that, the executed activities and processes in the organizational context are depend on the use, creation, discrimination of information, the costs related with these practices into high values except there is some work established to counter this. In view of this assertion, information technologies are vital tool that help to actualized organizational goals, and constitute a significant portion of organizational outflow.

The role of the information system in an organization can be well defined as resident of process data that can be utilized to minimized organizational cost. However, Castelao *et al.*, (2014) defined information architecture as a

structured set of multidimensional interconnected units that support the processes of information in all angle of the organization. In addition, Saiz *et al.,*(2010) view it as a framework that can be acquire, organize, and prioritize a wide spread series of technological knowledge that facilitate the ability to apply effectiveness and appropriateness in an organization. It also provides a conceptual framework for planning and implementing a well standards-based concept, digital information infrastructure that will integrate services and activities to achieve goals of enterprises. Similarly, Iyer *et al.*, (2010) added that it serves as a purpose of defining which information entities are required and how to interconnect with one another. In other word, it is the combination of organizational entities that are labelled and navigated with an information system. The information entity can be alleged as any concept (object) that is meaningful to the business context and relevant to the organization to store it as vital information. The information entity defines the attributes of the object having a name, a unique identifier and its relation to processes (Castelao *et al.,* 2014). Consequently, Guetat and Dakhli (2015) added that it encompasses of activities of that define, structure and document information resource that maintain quality and ensure security of information.

Organization suffer from quite number of problems which result to the way business is been conducted. However, among the problems facing the conduct of business in organization is the process of creating sustainable information Architecture. Lack of standardization is also a problem due to instability of technology that changes easily at any time. In light of the occurrences, developing enterprises information Architecture becomes a main concern that needed to address the issues (Castelao *et al.,* 2014).

Information Architect as a Tool to Enhance SMEs Performance

Information has become the most significant power required by the organizations due to its rapid change in technology and global market competition. Strategic role in organizations becomes paramount with the use of Information systems. Considering this occurrence, it supports and shape all angle of business strategy. However, Castelao *et al.* (2014) are of the view that with the use of Information systems it

shapes and supports competitive strategy of an organization affecting the rapidity and flexibility of decision making and make it easier to simulate to environmental conditions and changes. In view of this reason, information systems have become indispensable tool for modern businesses or global market. Moreover, it can also be a strategic tool for organization when used in innovations.

Determining the performance of Small and Medium Scale enterprises (SMEs) organization can only be recognise if the system is fully designed and implemented using information architecture succeed in its future operation (Saiz *et al.,* 2010). Added that, in other to provide enabling environment for performance management some key characteristics need to be consider in the Information Architecture. However, one of the characteristic is a clear difference between public and private data to their market competitors as company (SMEs) should be more careful in sharing their performance data. Secondly, the harmonization of the data is usually associated from different collaborated enterprises; it should be considered because data are collected differently using different format. Another characteristic is the use of performance indicator to defined unique performance objective in SMEs. In contrast, Kalkan, Erdil and Cetinkaya (2011) agreed that SMEs performance as based on the sales growth and profit that organization makes. This is because of strategic decision making within the organization based on its previous performance.

However, Martin and Dmitriev and Akeyord (2010) identified some issues affecting organizational performance with the use of AI as social and technical. Moreover, these issues led to the challenges bothering AI which are associated with are: Operational, Tactical and Strategical operation. However, Castelao *et al.,* (2014) and Guetat and Dakhli (2015) agreed that benefit can be derive from information Architecture in SMEs in terms of strategic advantages are: Reduce in operational cost and increase in effectiveness. However, it allows easy collaboration of information among competitor with an enhancement of security and privacy.

Enterprises rely on the uses of information technology (IT) for accuracy and appropriate management of information. However, Medina *et al.,* (2011)

agreed with this assertion and added that, very vast amount of data from an organisation are collected and managed with the help of IT tools, which may contribute to the organizational effectiveness and productivity. However, most of the organization view modern technologies as instruments to gain certain benefits and a times seen it as a tool to bring about innovation in the institutional corporate processes and business strategies. Medina et al (2011) argued that, to gain competitive advantage and improve the performance of an enterprises as well as making a good decision within enterprises are better achieved with the use for IT management tool, which becomes imperative in influences business strategy in an organisation. Safa *et al.,* (2015) and Wang *et al.,* (2015) agreed that, appropriate uses of IT within enterprises may yield a positive impact such as in terms of innovation, productivity and market competitiveness. In contrast Medina *et al.,* (2011) argued this may lead to an increase in cost of maintenance. Brenner, Schaaf and Tortonesi (2013) argued that, over some years IT management plays a significant role as IT- based problem solver and have been rapidly increased towards achieving the objectives of an organization. Wang *et al.,* (2015) argued that IT management is a mechanism or machinery that is used to transformed organizational IT assets. More, it is embedded into an organization to increase its performance and productivity.

Strategic IT management is very vital in tackling critical issues in determining organizational performance. However, Wilkin and Cerpa (2012) argued that strategic IT management aims to achieve better outcomes of business through IT performance. Firms that uses effective IT strategic management have recorded up to 20% higher profit, these indicate that the success related to the effective utilization of IT resource (Weill and Ross, 2005 in Walkin and Cerpa, 2012). In contrast, Wang et al., (2015) and Medina et al (2011) argued that some firms did not agree or convinced with the need.

MODELLING INFORMATION ARCHITECTURE FOR SMES FRAMEWORK

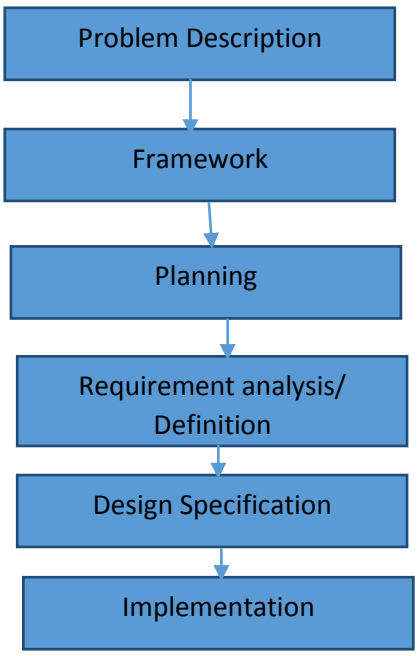
Modelling can be seen as a symbolic representation of reality aiming to understand the system to be developed. Furthermore, it presents a series of fundamentals that are necessary to consider in

understanding the context in which it runs (Pascoa, Martin and Tribolet, 2013). To build informational architecture for SMEs it is quite useful to identify the problems associate with it and provide a solution that is directly link to the problem. The assertion above is in accordance with Saiz *et al.,* (2014) that view IA as a useful tool to solve a problem that is identified within an organization.

However, added that the problems are divided into three compounds: Partner's data, Key Performance Indicators (KPIs) and Process.

- **Partner's Data:** public and private data need to be differentiated, so that shared data should be separated from confidential data.
- **KPI:** different performance indicators need to be separated such as Standardized Model and Aggregated indicators that comprise the parameters within the network.
- **Process:** it comprises of four basic steps to obtain the information require from individual indicator wither from Aggregate or standardized KPIs which are: Extraction, processing, storage and analysis.

However, Saiz *et al.* (2014) comes up with a conceptual framework of global performance management (GPM) and Small and Medium Scale enterprises (SMEs) framework that can be adopted in an organization which has 6 phases.



Phase 1: it enables enterprises to identified the scope of the performance measurement

Phase 2: it enables organization to identify the current situation of SMEs by gathering information from users using questionnaire as a data collecting tools. And then produce the framework of a scheme which can be solve either by using top-down or bottom-up approaches

Phase 3: it enables the organization to choose the most suitable migration path and apply.

Phase 4: Requirement Analysis/Definition; in order to meet the need of an organizational goal and end user expectation it is proper to define the deliverables of the system. However, in these regard requirement analysis focuses on four basic elements: tools, information handling, performance indicators and vertical application.

Phase 5: the design specification introduces the technological aspect of the performance, so as to develop a functional Architectural design that reflects the analysis definition.

Phase 6: implementation is the final stage of the framework which defines two issues: Technical issues and Guidelines for implementation.

In contrast Pascoa, Martin and Tribolet (2013) identify architectural framework into 3 components: Modelling, Implementation and validation. But altogether there trying to achieve the same goals and objectives in enhancing the performance of an enterprises.

CONCLUSION

Nowadays, information based has been increased within enterprises which make them to achieve their goals and improved information activities as a priority among its set objectives. The role of the information system in an organization can be well defined as resident of process data that can be utilized to minimized organizational cost. Information architectures show a strategic role in enabling the efficient and effective storage, retrieval, and analysis of data in enterprise information systems. For SMEs to achieve its set objectives it is paramount to adopt information architectural framework as a deriving tool in achieving a successful SMEs collaboration within and outside the organization.

REFERENCES

Brenner, M., Schaaf, T., Tortonesi, M. (2013) Business – Driven IT management coming of

Age. *A Report on the 7th IEEE/IFIP international workshop of Business – Driven IT management (BDIM 2012).* Pp. 326 – 333

Castelao, R., Vasconcelos, D.,A., T and Marque (2014) Planning the information architecture in a local public Organization. .*Information Development* [online]. 30 (3), pp. 223-234. Available at:<https://fenix.tecnico.ulisboa.pt/downloadFile/395142104202/InformationArchitecture_ExtAbstract_RicardoCastelao_57427.pdf>.

Guetat, S.B.A. and Dakhli, S.B.D. (2015) The Architecture Facet of Information Governance: The Case of Urbanized Information Systems. *Procedia Computer Science* [online], **64**pp. 1088-1098. Available at:<http://www.sciencedirect.com/science/article/pii/S1877050915026 99X>.

Iyer, A, Ghosh, A, & More, D (2010) Designing Information Architecture of a Digital Library. *CURIE Journal.* 3 (1) pp. 52-59.

Kalkan, A., Erdil, O. and Çetinkaya, Ö. (2011) The relationships between firm size, prospector strategy, architecture of information technology and firm performance. *Procedia - Social and Behavioral Sciences* [online]. **24**pp. 854-869. Available at:<http://www.sciencedirect.com/science/article/pii/S1877042811016429>.

Martin, A., Dmitriev, D. and Akeroyd, J. (2010) A resurgence of interest in Information Architecture. *International Journal of Information Management* [online]. **30**(1), pp. 6-12. Available at:<http://www.sciencedirect.com/science/article/pii/S0268401209001455>.

Medina, J., M., Lavin, J., Mora, A., and De-la-Garza, I. (2011) Influence of Information technology management on the organizational performance of the small and medium – sized enterprises. *Revista Innovar Journal.* 21(42) pp. 129 – 137. Available at : <http://www.revistas.unal.edu.co/index.php/innovar/article/view/35461/35843>.

Páscoa, C., Martins, T. and Tribolet, J. (2013) Operational Qualifications in the

Information Architecture Context. *Procedia Technology* [online]. **9**pp. 272-281. Available at:<http://www.sciencedirect.com/science/article/pii/S2212017313001850>.

Safa, N.S., Sookhak, M., Von Solms, R., Furnell, S., Ghani, N.A. and Herawan, T. (2015) Information security conscious care behaviour formation in organizations. *Computers & Security* [online]. **53,** pp. 65-78. Available at:<http://www.sciencedirect.com/science/article/pii/S0167404815000863>.

Saiz, J.J.A., Rodriguez, R.R., Bas, A.O. and Verdecho, M.J. (2010) An information architecture for a performance management framework by collaborating SMEs. *Computers in Industry* [online]. **61**(7), pp. 676-685. Available at:<http://www.sciencedirect.com/science/article/pii/S0166361510000291>.

Wang, Y., Shi, S., Nevo, S., Li, S. and Chen, Y. (2015) The interaction effect of IT assets and IT management on firm Performance: A system perspective. *International journal of information management*. 35, pp. 580 – 593. Available at: <www.elsevier.com/locate/ijinformgt>.

Wilkin, C. and Cerpa, N. (2012) Strategic Information Systems Planning: An Empirical Evaluation of Its Dimensions. *Journal of Technology Management &Innovation* [online]. **7**(2), pp. 52-62. Available at :<http://www.scielo.cl/pdf/jotmi/v7n2/art05.pdf>.