ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS FOR EFFECTIVE ORGANIZATIONAL PERFORMANCE:A CASE OF ERP IMPLEMENTATION AT THE AMERICAN UNIVERSITY OF NIGERIA

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ABSTRACT

Effective and efficient organizational performance is the aim which any organization wants to achieve. Enterprise Resource Planning (ERP) Systems is one of the key factors that contributes to the operational success of an organization, especially onewith larger operations. This paper presents an evaluation of the ERP systems functionalities and the perceived benefits on organizational performance. The paper has alsoinvestigated how American University of Nigeria implementedtheir ERP system and how it helps them improve their day to day business processes. Furthermore, the paper looks into the challenges,success factors, failures, and propose recommendations on how to improve ERP implementations. The method used in collecting data isinterview and questionnaires. The paper contributes to discussion on ERP implementation in organizations.

INTRODUCTION
BACKGROUND OF THE STUDY

Information and Communication Technology (ICT) has become major components of the competitive strategy of any businesses. ICT hasfurther made it possible for managers to integrate and link all business units together. Enterprise Resource Planning (ERP) system is an information system application that integrates and manages the entire business processes of an organizationsuch ashuman resources, finance, supply chain, sales, orders, scheduling, manufacturing and distribution etc. ERP is normally adopted by organizations with larger business operations, and it requires a dedicated IT teams to customize and analyze data and also to handle upgrades and deployment. ERP can be used not only in manufacturing companies, but in any company that wants to enhance competitiveness by most effectively using all assets including information (Mushavhanamadi K., Mbohwa C 2013). According to a Microsoft Website article,"With the right enterprise resource planning software, all your business processes come together for easy collaboration and rapid decision-making to enhance your team's overall productivity" (Microsoft Website 2016).

ERP systems automate and integrate business processes that can be found in a production environment, including business processes that take place in the production. They often integrate information organization of the supply chain, customers, human resources, finance and so on (Dusanka L. et al. 2013).Wen-H.T et al (2010) cited in Tsai et al (2007) that companies which implement ERP systems gain many advantages, including improving productivity, gaining competitive advantage, satisfying customer demand, and increasing their rapid response capabilities.Davenport and James (1990) examined the relationship between information technology capabilities and business process redesign, and concluded that IT represents a useful tool in business process redesign, and moreover that business process redesign should be transformed using IT (Wen-Hsien T. et al 2010). An ERP implementation takes many years to complete and requires a large amount of IT investment and their effectiveness is hard to evaluate (Wen-Hsien T. et al 2010).

The American University of Nigeria (AUN) has invested a huge amount of money todeploy an Enterprise Resource Planning (ERP) system in other to automate its business processes. The ERP system deployed by AUN integrates 5 Modules which are the main business functions of the university. These modules include

Academic Module, Human Resources, Accounting, Purchases and Store. This paper is going to examine AUN's ERP implementation and see how it helps improves their day to day business processes.

LITERATURE REVIEW

Enterprise Resource Planning (ERP)

In its basic definition, ERP is an enterprise-wide information system (IS) that integrates and controls all the business processes in the entire organization (R. Addo-T. P. Helo 2011). ERP software can also be referred to asintegrated standard software packages, enterprise systems, enterprise wide-systems, enterprise business-systems, integrated vendor software, and enterprise application systems.

M. Al-Mashari et al. (2003)cited in Rosemann (1999) that ERP system is defined as a customizable, standard application software which includes integrated business solutions for the core processes (e.g. production planning and control, warehouse management) and the main administrative functions (e.g., accounting, human resource management) of an enterprise. Slightly differently, Gable (1998), however, defines it as a comprehensive package software solutions which seeks to integrate the complete range of a business process and functions in order to present a holistic view of the business from a single information and IT architecture" (Al-Mashari et al., 2003).ERP systems are distinguished from "ordinary" IS by the fact that ERP systems have a high degree of integration and information commonality (Ulf Melin 2003).

The term **integration** means to "combine or be combined to form a whole" (Oxford Dictionary, 1999). Melin further stated thatin the IS area, this often means that different systems can exchange data. A high degree of integration means that systems easy can exchange strings of data. This is considered as an important change in the area compared to often historically isolated IS in organizations (with disparate operating systems, data base structures and formats based on disparate technical specifications and free-standing suppliers) (Ulf Melin 2003). An ERP system enable an organizations to integrate all its primary business processes in order to enhance efficiency and maintain a competitive position. However, without successful implementation of the system, the projected benefits of improved productivity and competitive advantage cannot be forthcoming (R. Addo-T. P. Helo 2011). ERP systems have become vital strategic tools in today's competitive business environment. ERP system facilitates the smooth flow of common functional information and practices across the entire organization. In addition, it improves the performance of the supply chain and reduces the cycle times (R. Addo-T. P. Helo 2011).

ERP Functionalities

An ERP system is categorized into 4 tiers depending on their complexity, features and functionality. (Galin Zhelyazkov 2010). We will look at some of the ERP functionalities for an organization. According to (SAP, 2011); ERP systems provide role-based access to crucial data, applications, and analytical tools in the following areas:(Galin Zhelyazkov 2010).

[1] **Financials** – Ensure compliance and predictability of business performance – so organizations can gain a deeper financial insight across the enterprise and tighten control of finances. They can alsoautomate financial and management accounting and financial supply chain management.

[2] **Human Capital Management** – Optimize human resource processes with a complete, integrated, and global human capital management solution. Organizations can maximize the potential of workforce, while supporting innovation, growth, and flexibility. They can automate talent management, core HR processes, and workforce deployment.

[3] **Operations** – Manage end-to-end procurement and logistics business processesfor complete business cycles including Bill of Materials, Order Management, Rough Cut Capacity Planning, Material Requirements, Capacity Requirements Planning, Purchasing, Inventory Management, Shop Floor Control, Forecasting, Demand Management, Master Production Scheduling, and Product Costing.

[4] **Corporate Services** – Helps organizations manage their most cost-intensive corporate functions by supporting and streamlining administrative processes in the areas of real estate; enterprise assets; project portfolios; corporate travel; environment, health, and safety compliance; quality; and global trade services.

[5] **Others** - Depending on the ERP software, functionality goes into different modules. However common functionality is Product Configuration, Distribution Requirements Planning, Quality Assurance/Management, Customer Service Management, Flexible Report Writer, Multi-site and Multi-National,Sales and Operations Planning, Finite Scheduling, Maintenance Management, Warehouse

Management, Transportation Management, SupplyChain Execution Management, Manufacturing Execution Systems, etc.(Galin Zhelyazkov 2010):

ERPfor Effective Organizational Performance

Previous research has shown that information technology may indeed contribute to the improvement of organizational performance (Nigel M. et al. 2004). Evidence from a survey on companies who have adopted ERP systems and their impact on management practice confirms a number of such benefits. The most highly-rated perceived benefits involve increased flexibility in information generation, improved quality of reports, increased integration of accounts applications and improved decisions based on timely and reliable accounting information(Amin A. et al2010).

According to Mary et al, (1996),numerous writers, including economists, consultants, professional managers, entrepreneurs, business professors and researchers, politicians and constituencies, have paid a great deal of attention to the issue of organizational effectiveness. Organizational effectiveness is defined as the extent to which an organization, by the use of certain resources, fulfills its objectives without depleting its resources and without placing undue strain on its members and/or society (Amin A. et al2010).Organizational effectiveness can also be defined in terms of the effectiveness of internal processes (Amin A. et al2010).

Effectiveness is also used against the efficiency. Efficiency means the resources that are consumed for producing goods or delivering services. Another meaning of efficiency is that it is associated with performing activities as well as possible or "doing things right''. But sometimes efficiency doesn't result to success. It may be possible that organizations present high efficiency but do notgain their objectives.Like the example given by Daft, "it would be arising from manufacturing the product without attention to consumers" (Amin A. et al2010). Campbell, (1977) mentioned that evaluation the impact of ERP systems on organizational effectiveness is so difficult. Some of the famous problems are the complexity and comprehensiveness of ERP systems, the lack of empirical research on the impact of ERP systems on organizational effectiveness, and the shortcomings of traditional multivariate methods (such as factor analysis) for solving problems related to organizational effectiveness (Amin A. et al2010).Evidence suggests that businesses expect ERP systems to deliver improved company performance(Charalambos Spathis, et al, 2005).

In the course of evaluating the impact of ERP implementation on business processes and companies, many researchers have made their generic models. The main purpose of each model was to investigate the influence of several aspects of ERP implementation and later ERP production at the company's performance and the performance of business process. In some models, it was found that it was longer implementation, the overall performance of the company increases, but the performance of the business processes remain the same. One explanation for the absence of a positive impact on the company's performance in the short term is that the cost of implementing ERP investments tends to exceed the short-term and medium-term increase in productivity (Dusanka L. et al 2013).

The main reason for organization existence is to achieve objectives and acquires effectiveness (Daft, 2003). ERP systems are by many regarded as a dream come true and are in most cases implemented in order to improve organizational effectiveness (T.Davenport, 1998). They further stated that "Implementation of enterprise resource planning systems improves organization effectiveness". Some studies also described cases where the implementation failed and the impact had the opposite effect on organizational effectiveness. However, ERP systems are huge and complex and have different implementation results.(Amin A. et al2010).

ERP systems allow companies to replace their existing information systems, which are often incompatible with one another, with a single, integrated system. By streamlining data flows throughout an organization, commercial software, offered by vendors like SAP, promise dramatic gains in a company's efficiency and bottom line (Davenport 1998).

It is interesting that the long-term use of ERP has the effect of improving business processes, but there is also improvement to the overall company performance. Thus, it is proven top management and owners have benefited from long-term use of ERP systems (Dusanka L. et al 2013).However, without top management support, having appropriate business plan and vision, re-engineering business processes, effective project management, user involvement and education and/or training, organizations cannot embrace the full benefits of such complex system and the risk of failure might be at a high level (R. Addo-T. P. Helo 2011).

American University of Nigeria

The American University of Nigeria (AUN) is a private university in northeastern Nigeria that offers American style higher education programs at the undergraduate, graduate and professional levels. Founded in 2004 (Premium Times Nigeria 2015). It is the only American style university in Sub-Saharan Africa.

Founded in 2004 by Atiku Abubakar, Nigeria's former vice president, the American University of Nigeria opened its doors to its first students in 2005. The university is located in northeastern Nigeria in Yola, the state capital of Adamawa state. The university was originally named the ABTI American University of Nigeria before the name was simplified to American University of Nigeria. This puts it in conformity with practices of other American style universities outside of the United States, such as the American University of Beirut and the American University of Paris. AUN is the only American style institution of higher learning in sub-Saharan Africa (the only other such university in Africa is the American University in Cairo in Egypt). AUN is a member of the Association of American International Colleges and Universities. (Wikipedia 2016).

AUN is a residential campus situated on 2,400 hectares.It is home to approximately 1,400 undergraduate students and 87 faculty members. The university's e-Library Project was awarded the American Library Association's Presidential Citation for Innovative International Library Projects in 2013 (ALA 2015).

For the American University of Nigeria (AUN) to meet its vast operational capabilities in serving over 2000 students, staff and faculty, there is need for ERP implementation to automate and simplify the operational processes. In this regard, the university is getting advantage of the technology, which has significantly lowered many operational costs. With the help of ERP automation, process management and innovation, the university is carrying out their operationsin a faster and efficient way.

AUN is also one of the few institutions in Nigeria which are pioneers of ERP implementation initiatives. A more detailed and comprehensive information related to AUN ERP initiatives will be presented further in this paper.

METHODOLOGY

For validity and reliability, this research employed a mix method; where interview and questionnaire were used in gathering data on AUN ERP initiatives and its effects. The surveyed employees represented all the various functions and departments of the university. A total of 50 questionnaires were sent to the participants i.e. employees of university in different departments, and these responses were collected and analyzed with the help of Google forms. Data reliability and validity were ensured to the maximum level possible.

FINDINGS AND ANALYSIS

This segment is divided into two sections. The first discusses the findings on AUN ERP initiatives gathered from interview, while the later part presents results and analysis from the questionnaire responses.

Findings from Interview: ERP implementation at AUN.

An interview has been conducted with the Manager Software Development unit (SDU) of the American university of Nigeria, (Dr.) Fatima Chiroma, on the general ERP implementation at the University. TheOpenERP project is handed over to the software development unit (SDU), and they are currently responsible for the development, customization, fixing the system bugs and errors of the system. Below are the interview Q&A's.

Q1. How did Open ERP implementation Process started at AUN?

The American university of Nigeria already hasan enterprise resource planning System that integrate all the university operational processes (Banner ERP) since its inception, but the previous ERP system they were using is costing the university a lot of money as a fee paid to vendors for using their application. The Previous ERP also had some limitations; such as it cannot be customized, and features/modules cannot be added to it.

Due to the above challenge with the previous AUN ERP system, they have to look at an alternative ERP system that can be customized to suit the university needs. This led one of the AUN faculty Mr Felix Bolou to initiate studies on how to implement an open source ERP system called OpenERP, which is an open source application and it allows customization, there by adding or removing features that is not needed by the university. Moreover, saving the university a lot of money because it is an open source.

Q2. How did Open ERP development started at AUN.

After Mr Felix Bolou initiated the open ERP project, it was then endorsed by the AUN Dean school of Information Technology and Communications (SITC), Dr. Mathias Fonkam. They now form a group of 4 SITC students who had interest in software development in order to adopt the Open ERP development as their Senior Design project (SDP) and see how well it goes before recommending it for adoption in the whole university.

The Team members includes Michael Njoku, Tosin Komolafe, Japari Ngilari and Daniel Harbor. In 2011, the team members successfully implemented OpenERP as their final year Senior Design Project (SDP).

The university management have seen the level of reliability and stability of the Open ERP system; the Chief information Officer (CIO) of the university showed interest in the project after seen the huge sum of money the new ERP system will save the university. The CIO has taken Full responsibility of the new OpenERP system implementation and customization for the university; all the four (4) students were retained to work on the New OpenERP project. All the four students and other software developers in the university (about 10+) were sent for a technical training so as to acquire more skill and knowledge from OpenERP experts. The team have successfully added**academic** and **admissions** module (build from scratch) and integrate it into the new ERP system in addition to customizing the existing modules in the system; such as HR, Finance etc.

Q3. **When Was the New Open ERP Deployed?**

The New Open ERP was deployed in the year 2013, but users started using it in 2014. The departments to start using the New OpenERP from the beginning were the Bursary department, Admissions and Registrar.

Q4. What do you thing are the advantages of the OpenERP system?

One of the advantages of OpenERP is that it saves the university huge sum of money unlike the previous ERP application being used by the university. Another advantages of the new OpenERP system is that it is an open source application; therefor users can customize the system to suit their needs. Also the New OpenERP is more user friendly that the previous ERP; in which users have t always use codes to do query or do other works in the system.

Q5. How long does it take to finish developing the New OpenERP system at AUN?

As you know that ERP system development take years to finish, as they are complex systems. The AUN Open ERP system development has taken 2 years. Even though the development is an ongoing process and can take more years before the system can become stable. It might take time for users to be familiar with the system, and the users will also request for some features to be added to the system.

**Results and analysis from Questionnaire Responses.**

This section will analyze the results gathered from the questionnaire responses. A total of 60 Questionnaires were shared to the employees of the American university of Nigeria, to get their view on the ERP system used by the university. But only 41 responses were received.
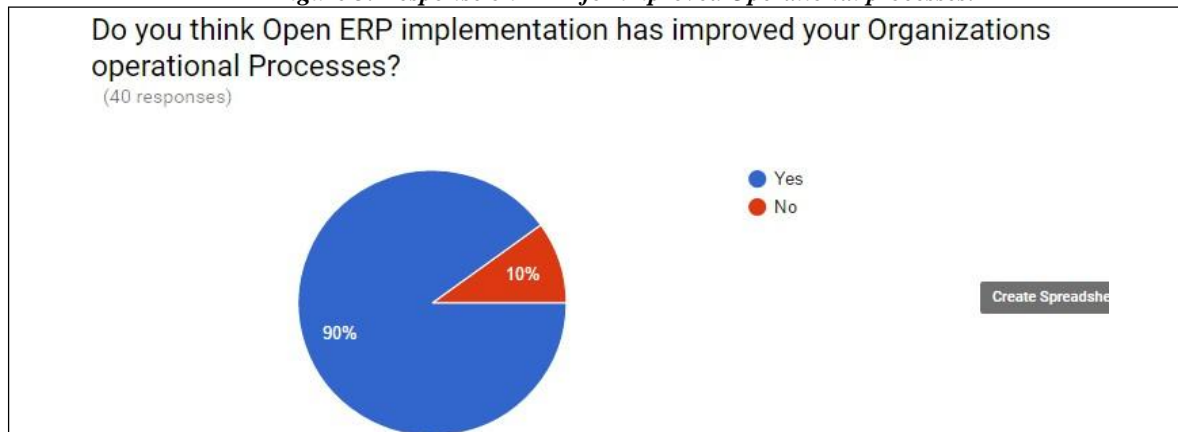
Demographics

Figure 1. Gender of the Respondents
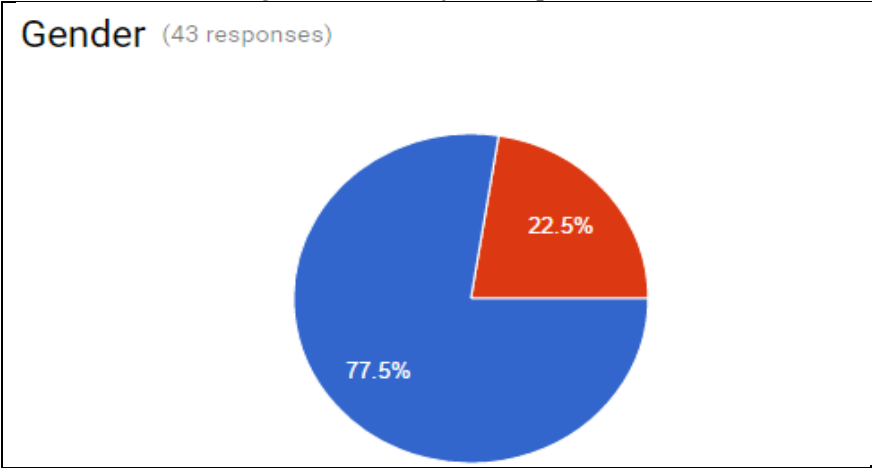
Figure 2. Ages of the Respondents
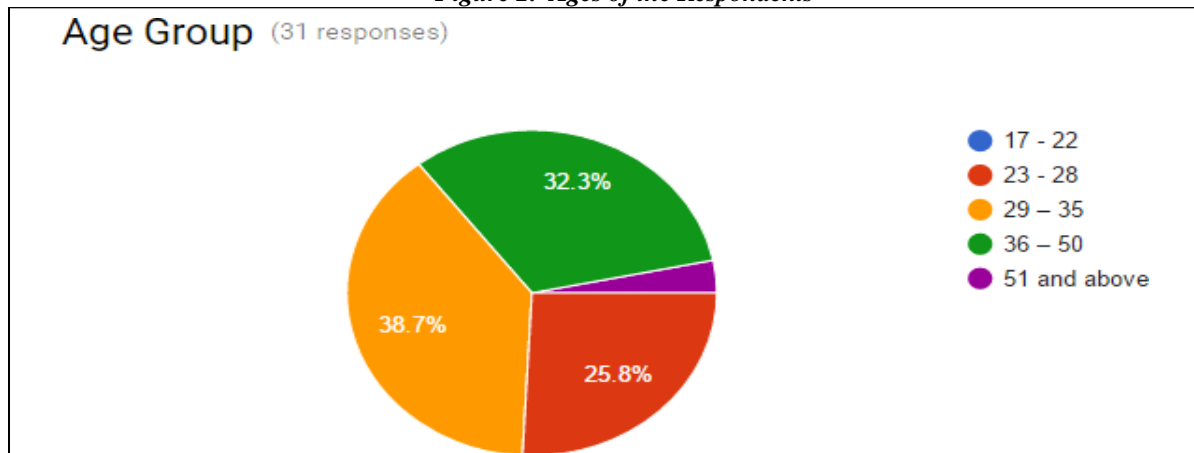
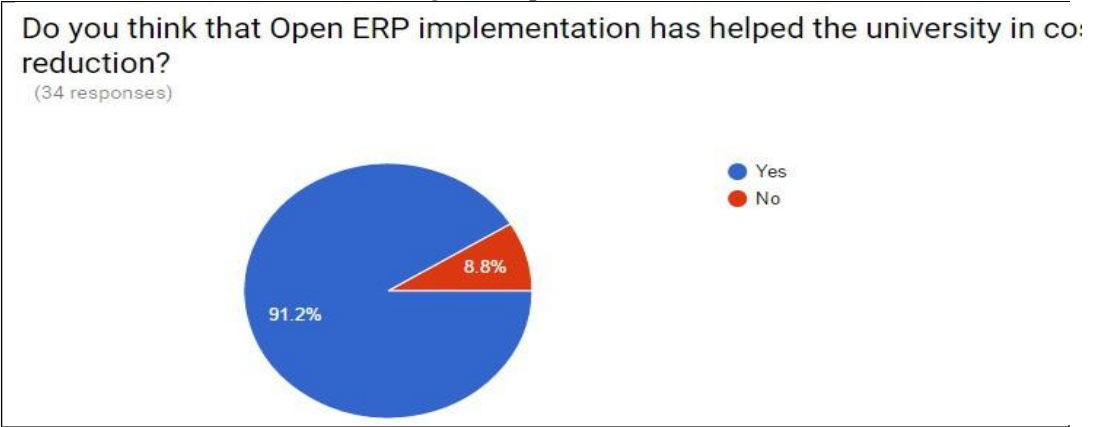*Figure 3. Response on ERP for improved Operational processes.*

About 90% of the respondent agree that the new AUN ERP system has help in improving organizational operation process and only 10% percent disagree. This has shown that almost all the AUN employees believes in the capability and stability of the ERP system.
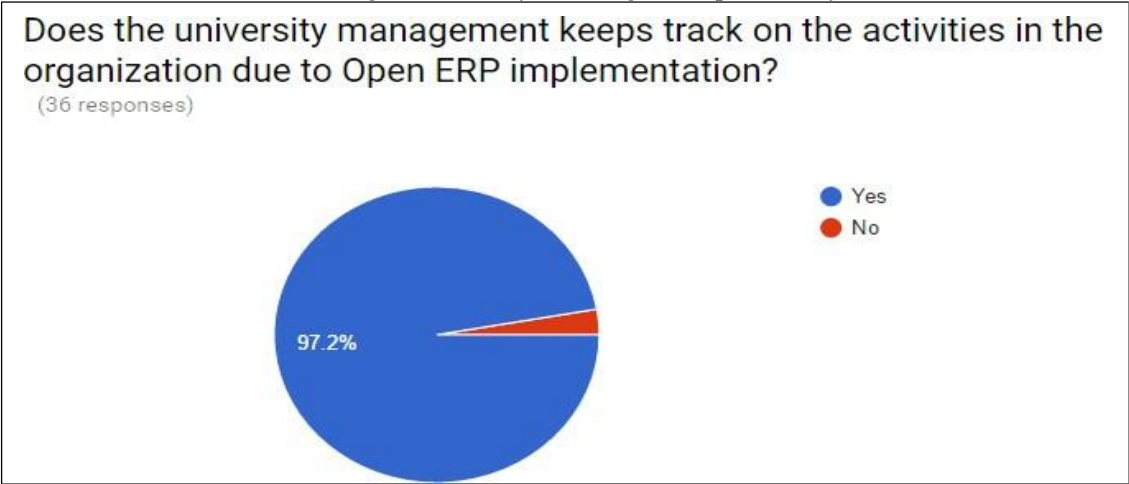
Figure 4. ERP and Workload reduction
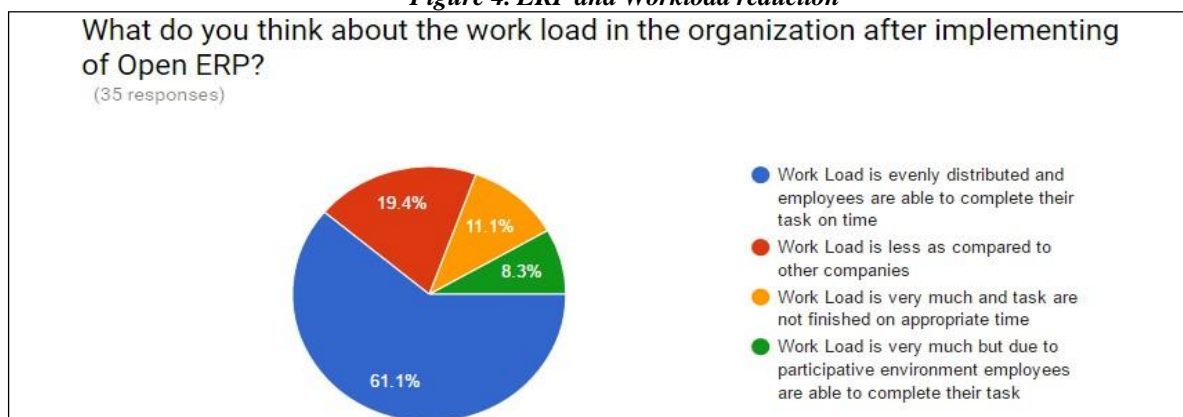
About 61.1% of the respondents believes that the AUN ERP system has help in distribution and completion of task and tasks on time. While 11% of the respondent have a negative experience with the ERP system, believing that Workload is very much and tasks are not completed on appropriate time; this might be due to them not being familiar with the system or are not having the required IT skills to operate the system.

Figure 5. OpenERP and cost reduction

Do you think that Open ERP implementation has helped the university in co:
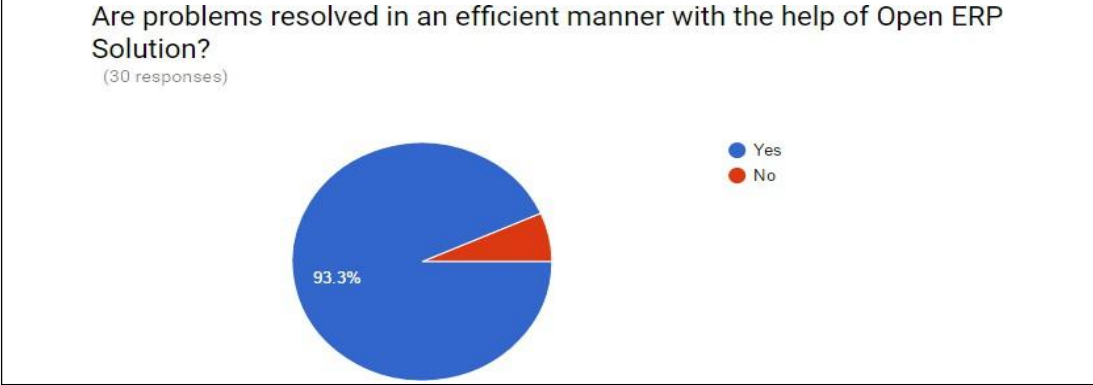reduction?

(34 responses)

● Yes
● No

8.8%

91.2%

About 91% of the respondents believes that AUN ERP system saves the university cost. It has helps in reducing paper work thereby saving paper printing cost. The new ERP system also saves the university a huge subscription cost unlike the previous ERP they were using; as their new ERP is an open source, they only pay modest consultation and usage fee.

Figure 6. Activity Tracking with OpenERP System

Does the university management keeps track on the activities in the organization due to Open ERP implementation?

(36 responses)

● Yes
● No

97.2%

The New ERP system has given the management the ability to track all the activity processes within the university easily. 97% of the respondents also recognize that the ERP system allow tracking of activities within the university.

Figure 7. Problem Solving with ERP system

Are problems resolved in an efficient manner with the help of Open ERP Solution?

(30 responses)

● Yes
● No

93.3%

Because the ERP system contains lots of information, this makes solving problems and also decision making to be quick and easy. 93.3% of the respondents also believe in the ability of the AUN ERP system in quick problem solving.

Figure 8. General Satisfaction on the ERP system.
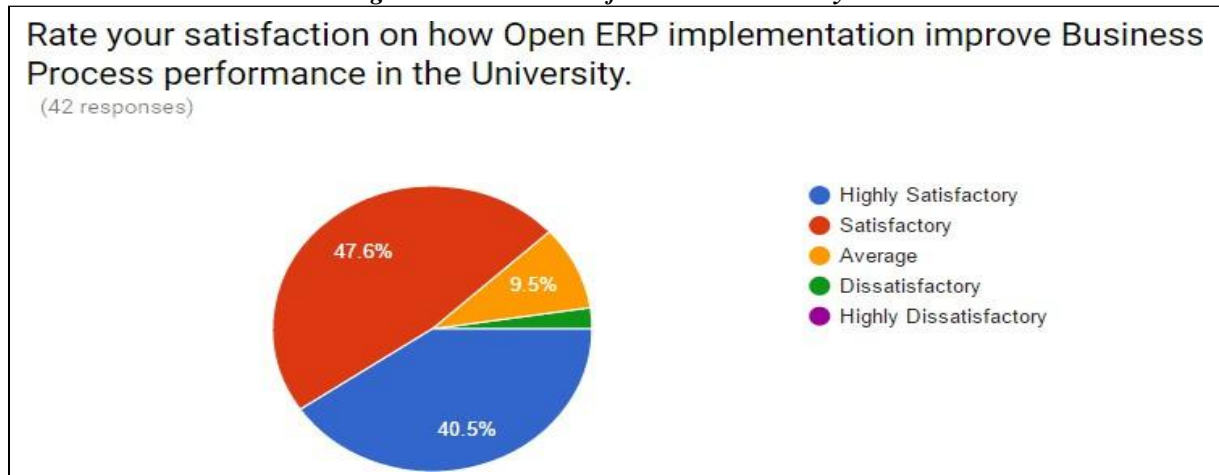
In general, almost all the AUN staff are satisfied and enjoy working with the ERP system. With 47.6% of them highly satisfied, 40.5% of them are satisfied and only 1% dissatisfied. This shows that the ERP system is improving the business processes of the university.

CONCLUSION

ERP projects involves a long term development process and can also cost huge sum of money, that is the reason why not all organizations can afford to implement it. ERP implementationhelps organizations to improve their business processes and improve their effectiveness; as shown earlier in this research. Most organizations adopt ERP in order to boost their performance. Also as seen in the questionnaire responses; majority of the staff of the American university of Nigeria Believes in the ability of ERP system to improve their performance and the business process as a whole. It is recommended for any financially able business that wants to automate their business process and also to have competitive advantage to deploy ERP application.

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