

The Extent and Significance of the Drivers of Adoption-Use of Open Source ERP by Deposit Taking Saccos in Kenya

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ABSTRACT

Deposit taking credit and savings cooperatives in Kenya are increasingly utilizing open source enterprise resource planning to better manage resources and improve efficiency. The most successful adoption of technology results from understanding the target population and the factors influencing their rate of adoption. The aim of the study was to establish the extent and significance of the drivers of adoption-use of open source ERP by deposit taking SACCOs in Kenya. The extent of adoption using diffusion of innovation theory and the significance of the drivers of adoption –use were assessed using technology, organisation, environment framework and extended decomposed theory of perceived behaviour. The unit of analysis was the 164 deposit-taking SACCOs licensed by SACCO regulatory authority (SASRA) in 2016 and sample size of 378 respondents. Questionnaire was used to collect quantitative data. Descriptive analysis was conducted on the data using SPSS. The study concludes that the extent of adoption is that 85.5% of the deposit taking SACCOs have adopted open source ERP with 14.5% not yet adopted and are categorised as laggards. The study concludes that technology, organisation, environment, attitude, normative structure and perceived behaviour adoption drivers have influence on the adoption-use of the open source ERP. The SACCO management and policy makers should put more effort on the high ranking factor components to attract the SACCOs which haven't adopted (laggards) and increase the adoption-use of open source ERP by deposit taking SACCOs in Kenya.

Keywords: deposit-taking SACCOs, adoption-use, technology, organisation, environment, attitude, normative structure, perceived behaviour.

1.0 INTRODUCTION

The cooperative societies in Kenya employ more than 300,000 people, besides providing opportunities for self-employment to many more and are the fastest growing sub-sector in the movement. Deposit-Taking

SACCOs are basically member-owned and not for profit but to provide savings, credit and other financial services to their members. The total number of societies and unions rose by 7.3 per cent from 13,256 in 2012 to 14,228 in 2013. Overall, a total of 972 additional cooperative societies and unions were registered, with almost half of these being savings and credit cooperative societies, with membership standing at more than eight million Kenyans (International Monetary Fund, 2012). The cooperative movement is organised into service and producer entities that cut across various sectors focusing on both private and public enterprises. Since 1908 when the first cooperative society was formed in Kenya, cooperatives have made remarkable progress, Deposit Taking Savings and Credit Cooperatives (Deposit-Taking SACCOs) provide access to financial services to low income households in Kenya. Deposit-Taking SACCOs are one of the leading sources of rural finance and in many rural areas businesses and households the local Deposit-Taking SACCOs are the only provider of financial services (Supervision Annual Report, 2014). The cooperative movement in Kenya has improved mainly in the areas of disbursement of loans. However, it continues to miss opportunities from the use of modern Information Communication Technology (ICT) platforms. There is a need to refocus and re-assess its capacity not just only to mobilizing financial resources further, but cheap and effective technology adoption and prudent resource management for faster economic growth (Gunga, 2008).

Studies carried globally have shown that the quality of the technology is considered a key issue affecting information systems acceptance which would result in improved organizational performance (Al-Mamary *et al.*, 2014). In USA, Petter *et al.*, (2008) established that technology quality is the desirable characteristics of any information system. The technology quality characteristics which include; ease of use, system flexibility, system reliability, ease of learning, system success features of intuitiveness, sophistication, flexibility, and response times, are all referred to as technology complexity. Much of the studies are devoted to impact of technology to acceptance of information systems (Hwang, *et al.* 2008; Park, *et al.* 2011). Other studies carried out in Utara Malaysia and in Libya dealt with similarities between cultural, structural and technological factors in adoption of ERP systems and organization performance in developing countries. In these studies, technology factors specifically technology complexity, compatibility factors are observed on how they impact firm adoption of ERP systems (Hwang, *et al.* 2008; Park, *et al.* 2011). However, the studies do not show other technological aspects such as; relative advantage, compatibility, trialability and observability influence on Open source ERP adoption.

Muriithi *et al.*, (2016), undertook a study to establish how ICTs are being used to support collaborative research in Kenya, and identify factors within the ICT ecosystem that contribute to their adoption and use.

A mixed methods research design, involving 248 academic scientists in 4 disciplines across 4 major Kenyan universities, was employed. The study found little diversity in forms of ICTs used to support collaborative research within the studied population. Several factors affect adoption and use practices, including availability and access to ICT resources, nature of the work, national and institutional ICT and research environments and the social cultural practices of researchers. The findings were explained using Unified Theory of Acceptance and Use of Technology model, which identifies four main constructs that affect adoption of technology such as performance expectancy, effort expectancy, facilitating conditions and social influence

1.1 Statement of the problem

The most successful adoption of technology results from understanding the target population and the factors influencing their rate of adoption. Based on the large number of Deposit-Taking SACCOs, their increasingly adoption and interest in open source ERP systems and their impact on the Kenyan economy, little academic attention has gone to the assessment of the drivers of open source ERP adoption and its impact in the industry. Given the projected increase in adoption of ERP systems it is imperative to understand extent of adoption and the prominence of the determinants that facilitate the adoption-use of this technology into firms' daily operations. Therefore there is a need to better understand the drivers for adoption-use of open source ERPs. This is particularly true for Deposit-Taking SACCOs as the design for these ERP systems has drastically changed and the cost of implementing them is a nonissue. The low extant study on open source ERP adoption-use has certainly inhibited the understanding of the field among practitioners in a manner that can precipitate information for more absorption of the software.

1.2 The study therefore sought to address the following objectives;

- i. To determine the extent of adoption-use of open source ERP by Deposit-Taking SACCOs in Kenya.
- ii. To identify the significance of the factor components influencing the adoption-use of open source enterprise resource planning by Deposit-Taking SACCOs in Kenya.

1.3 Conceptual framework

To implement the study various independent variables were defined and a relationship between them and the dependent variable were shown on the conceptual framework (see figure 1). The use of the word "usage" is synonymous with "adoption" has been used to create the research model and used in practice by several information system studies such as by Yaser et al (2015) and Ahmad Reda (2017). Usage and adoption are a duality and both are essential in that neither alone can lead to success. Usage is the ante in the IT transition game while adoption is all about behaviors' which are inherent and subjective.

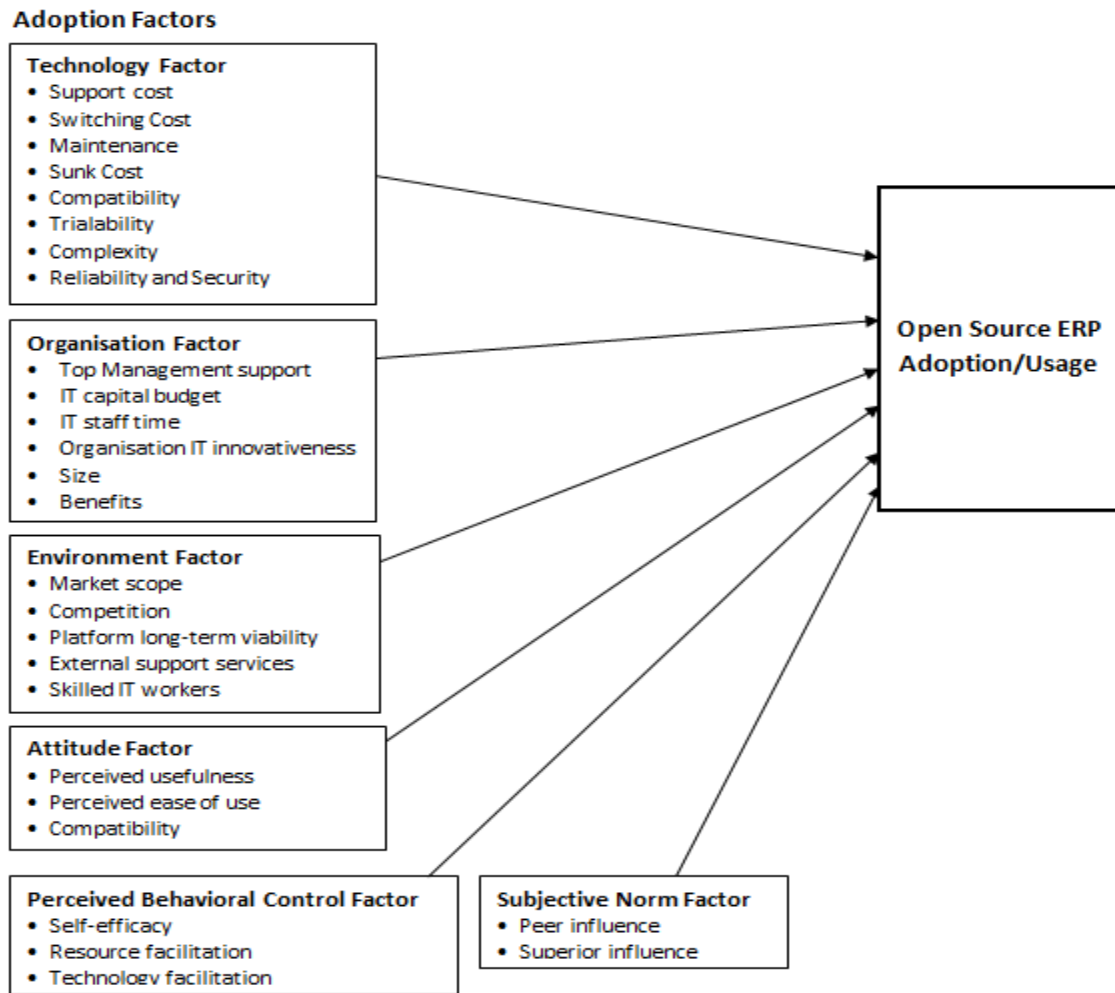


Figure 1: Drivers influencing adoption-use of open source ERP by deposit-taking SACCOS in Kenya.

2. LITERATURE REVIEW

2.1 Theoretical Review

A. *Technology-Organisation-Environment (TOE) Framework*

It is a fundamental approach to investigating a firm context that influences the process by which it adopts, implements, and diffuses technological innovations. A firm functions along three dimensions of technology, organisation, and environment (TOE), which influence the firm's ability to adopt or reject new technology. The Technology-Organisational-Environment (TOE) framework has been used to understand how firms adopt technology for many years (Morgan and Finnegan, 2007).

B. Decomposed Theory of Planned Behaviour (DTPB)

Originated from IS research field and first published in the 1990s (Taylor and Todd, 1995). As an extension of TPB (Ajzen, 1991), decomposed TPB more completely explores individual/people dimensions that drive the adoption-use of technology. In DTPB model attitudinal, normative and control beliefs are decomposed into multi-dimensional belief constructs. Reasons for adopting DTPB in IS research in general, and OSS research in particular, is that the DTPB has three principle components (attitude, Normative structure s, and perceived behavioral control), which are applicable to a wide variety of complex and subjective factors associated with ICT adoption and therefore relevant for exploring and developing valid explanations of diverse factors influencing the adoption of open source ERP.

C. Diffusion of Innovation Theory (DoI)

Developed by Rogers in 1995, DoI explains how, overtime technology gains momentum and diffuses (spreads) through a specific population or social system. The end result is that people or organisations adopt the technology. Adoption means that a person or organisation does something differently than what they had previously (purchase or use a new technology). It's important to understand the characteristics of the target population that will help or hinder adoption of the innovation. There are five adopter categories; innovators – these are people or organisations who want to be first to try the innovation. They are venturesome and interested in new ideas. Early adopters- these are people within the organisation who are the opinion leaders. They enjoy leadership roles, and embrace change opportunities. .Early majority- these are people or organisations that adopt an innovation after a varying degree of time that is significantly longer than the innovators and early adopters. Late majority- These are people or organisation that are skeptical to change, and will only adopt an innovation after it has been tried by the majority. Laggards – these are people or organisations that are bound by tradition, very conservative and loathe change. This study will use the DoI model to understand the extend of adoption of open source ERP among the Deposit-Taking SACCOs in Kenya and offer strategies accordingly after analysing the various drivers for adoption of open source ERP by the study population.

2.2 Empirical Review

2.2.1 Extent of adoption-use

Anderson et al. (1998) studied the attitudes, skills, and behaviors of the faculty members related to their IT use at a large Canadian research university. Based on Roger's (1995) two major adopter categories, they defined the faculty members as “earlier adopters” and “mainstream faculty” and provided strategies for reducing the gap between these two groups. VéroniqueVasseur (2012) studied the types of individuals

or households that decide to adopt or reject photovoltaic technology in Netherlands. The study results categorised four segments of technology adopters; voluntary adopters, involuntary adopters, potential adopters and rejecters. Norton *et al.*, (2019), investigated the organizational influences on healthcare system adoption and use of advanced health information technology capabilities in the United States. Responses from the 2017/2018 National Survey of Healthcare Organizations and Systems were used to assess the extent to which healthcare system organizational structure, electronic health record (EHR) standardization, and resource allocation practices were associated with use of 5 advanced HIT capabilities. Of 732 systems surveyed, 446 responded (60.9%), 425 (58.1%) met sample inclusion criteria, and 389 (53.1%) reported consistent EHR use. Multivariate linear regression with control variables estimated the relationships. The study results were; adoption of advanced HIT capabilities is low and variable, with a mean of 2.4 capabilities adopted and only 8.4% of systems reporting widespread adoption of all 5 capabilities. The study concluded that health systems that standardize their EHRs and that own and manage hospitals and medical groups have higher rates of advanced HIT adoption and use. System leaders looking to increase the use of advanced HIT capabilities should consider ways to better standardize their EHRs across organizations.

2.2.2 Drivers for adoption-use of open source ERP.

Rogers (1995) defines Relative Advantage as “the degree to which an innovation is seen as being superior to its predecessor”. Thong (1999) claims that Relative Advantage has positive impact on ICT adoption by reducing operational and administrative costs, improving business processes, and so on. ERP provides their adopters with many benefits and therefore organisations are very much motivated to adopt. Compatibility is “the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopter” (Roger, 1995); this variable is found to be making much positive influence on organisations in the adoption of ERP (Premkumar, 2003). Adoption of new technology is accompanied by changes in how businesses operate. These changes inherently carry reluctance from employees’ side; when the new technology is very much compatible, reluctance is minimized. Complexity is “the degree to which an innovation is seen by the potential adopter as being relative difficult to use and understand” (Rogers 1995). The higher the complexity of a new technology the higher the possibility of facing failures in the implementation and adoption of such technology hence the decision to go for such technology is risky (Premkumar and Roberts 1999).

Chaiwoo and Coughlin (2015) researched the generational differences in adoption and use of information and communications technology. Based on responses from a large-scale survey, this study investigates

older adults' adoption and use of two ICT devices - mobile phones and PCs. Detailed open-ended responses from a national sample were quantitatively coded and analyzed with frequency analysis. The results of this study suggest that older adults' decisions on adoption and use of ICT are affected by multiple factors, including assessment of value, relevance with past experiences, compatibility with lifestyle, and affordability. Furthermore, findings from a comparative analysis suggest that perceived importance and effects of various adoption factors are different between generations, as well as between technology types and between stages of adoption – purchase, initial use and continued use.

As this complexity factor is found to be negatively influencing the firm's adoption decision on ERP, it is considered to be an important factor of open source software adoption by them (Thong 1999; Ramdani *et al.* 2003). Triability is "the degree to which an idea can be experimented with on a limited basis" (Rogers, 1995). This factor is considered to be important in organization adoption of ERP since it was found to be influencing firms in the adoption of electronic commerce in previous studies (Kendall *et al.* 2001). Observability "the degree to which the results on an innovation are visible" (Rogers 1995). Ramdani *et al.* (2003) found this variable to be a significant variable in firms' adoption of ERP.

According to Jeyaraj *et al.* (2006) top management support which is highly prioritized factor in the firms' information systems adoption refers to whether or not the executives or the people in the top management of a firm understand the nature and functions of ERP. They support the adoption of the same by means of communication as well as reinforcement of the ideas affecting the adoption of new information systems. This factor has been found to be critical in creating conducive atmosphere for the adoption of new technologies and allocation of adequate resources for the adoption of new technologies (Wang *et al.*, 2007). Since the implementation and adoption of ERP are usually a bigger project and a huge undertaking for the firm, the implementation of open source ERP involves integration of resources and re-engineering of the business processes, hence the support from top management, mostly the decision makers in the case of Deposit-Taking SACCOs, is very crucial.

If a given company has adequate resource such as plentiful budget, sufficient human resource support, ample time, and good involvement from top management, then the adopting of ERPs will be met in a positive manner. To this end, the adequate resources factor is critical to the successful adoption (Chang *et al.* 2006) of open source ERPs by the firm. Any serious company will always want to be the leader not the follower and thus being more innovative in adopting "cutting edge" innovations. Technology that exists in a firm impacts its performance and seems that innovation orientation appears to be an important factor

in terms of the timing of adoption, and also in terms of the kinds of cues that are relevant to the decision to adopt (Dedrick and West, 2003). The Size aspect of the firm has also been found to be one of the most important factors influencing the organisation's adoption of new technology (Jeyaraj *et al.*, 2006). It is argued that if the size of an organisation is large, the firm has more needs, more resources, more skills and more experience and the capacity to exist in times of failures than other firms smaller in size (Ramdani *et al.* 2003), making it clear that if the firm size is big then likelihood of the adoption of new technology is also high. The study of Chang *et al.* (2006) found that the Benefits reaped from of information systems will lead to a positive adoption. Potential benefits such as improving the firm's image, gaining strategic advantage over other firms, improving their product or service quality, and enhancing the efficiency of internal operations will also be critical.

Kwan and West (2005) examined OSS adoption in large enterprises. In particular, they defined four critical attributes, industry context, firm context, organizational attitudes towards standards, and towards open standard. The industry context is considered critical, as it can influence the IT decisions of single companies. The firm context also is determinant as different companies will have different competitive positions and specific roles for the IT department. The organizational attitudes towards standards and open standard are drivers of OSS adoption. The greater is the attitude towards open data standards, the larger are the opportunities for the adoption. The latter aspect is concerned in general with companies' attitude towards the OSS movement. Some companies are neutral in this aspect, while others are unbalanced either towards proprietary software or FLOSS, increasing the probabilities of a successful technological change inside the organization.

3.0 METHODOLOGY

The study adopted correlational research design as it is designed to investigate extent and drivers for open source enterprise resource planning software adoption-use by of deposit taking savings and credit cooperatives in Kenya. The target population is the 164 deposit taking SACCOs licensed by SASRA as at 31st December 2016. Consistent with the prior research into ICT innovations and given the focus of this study, the target respondent group is senior managers for example: General Manager, Chief Accounting Officer, Procurement Officer, Human Resource Manager, Customer Service Manager, and ICT Manager with dedicated involvement in the adoption and implementation of ERP in organisations. A total of 378 questionnaires were self-administered to the respondents accompanied. The semi structured questionnaires were constructed using the 1-5 Likert scale type of statements, where the

respondents were required to either to indicate strongly agree (5), agree (4), not sure (3), disagree (2) and strongly disagree (1).

3.1 Analysis

Descriptive statistics was analysed using the statistical package for social sciences (SPSS). Measure of central tendency (mean), measure of dispersion (standard deviation) and distribution (percentage and frequency) were used to measure the significance of the drivers for adoption-use of open source ERP by deposit taking SACCOs in Kenya.

4.0 RESULTS

4.1 SACCOs Demographic Information

Of the 378 total respondents, a total of 298 questionnaires were filled and returned, 9 of the returned questionnaires had invalid responses and were discarded and 289 questionnaires were found to be correct and were used for study analysis. The demographics of the sample were as follows (see table 1). Majority of 54% of the respondents were men and in terms of education level, bachelor degree graduates accounted for the largest share of 50.5%. Staff in the position of customer service manager accounted for the largest number of respondents in the target group. In terms of length of service between 5 and 10 years represented 45.7% of the total respondents. Meanwhile in terms of ICT knowledge of the respondents 146 representing 50.5% had good knowledge in ICT.

Table 1: Demographic Information

| Demographics Profile | | Frequency | % |
|----------------------|----------------------------|-----------|------|
| Gender | Male | 156 | 54 |
| | Female | 133 | 46 |
| Education Level | certificate | 4 | 1.4 |
| | Diploma | 60 | 20.8 |
| | Bachelor | 146 | 50.5 |
| | Postgraduate | 79 | 27.3 |
| Current Job Position | General Manager | 9 | 3.1 |
| | Chief Accountant | 38 | 13.1 |
| | Human Resource Manager | 64 | 22.1 |
| | Senior Procurement Officer | 61 | 21.1 |
| | Customer Service Manager | 68 | 23.5 |
| | ICT Manager | 49 | 17 |
| Length of service | 1-4 years | 61 | 21.1 |
| | 5-10 years | 132 | 45.7 |
| | Above 10 years | 96 | 33.2 |
| ICT Knowledge | Moderate | 50 | 17.3 |
| | Good | 146 | 50.5 |
| | Excellent | 93 | 32.2 |

4.2 Extent of open source ERP adoption-use

The respondents were asked to select the number of modules they are using to show the extent to which they have adopted the open source ERP in their respective Deposit-Taking SACCOs. The core modules selected for the study and frequently used by these organisations are; Accounting/Finance (co-banking), Human Resource (HR), Procurement (SRM), and Customer Services (CRM). Table 2.0 shows the response on extend of adoption.

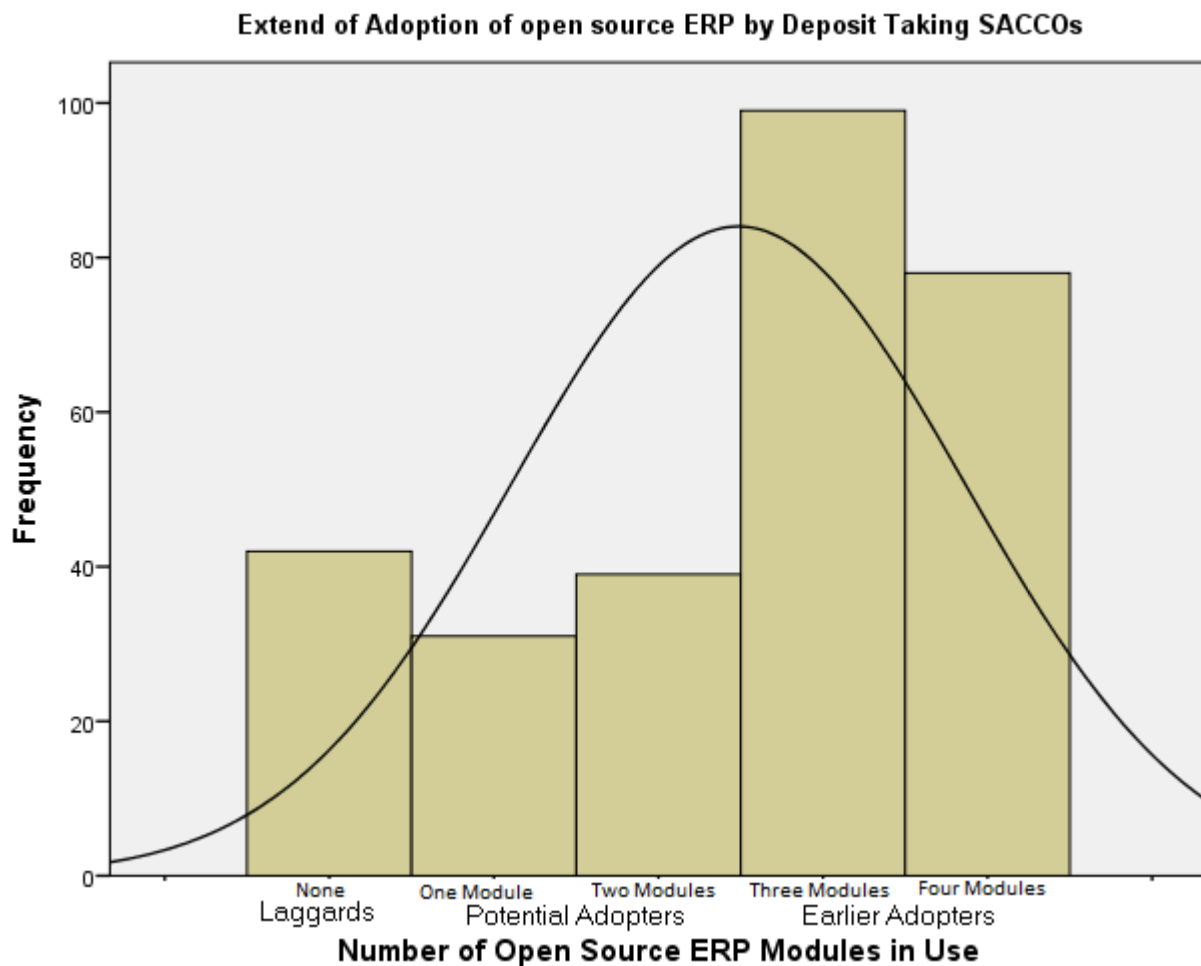
Table 2.0 Extent of adoption table

| Modules Used | Frequency | Percent |
|---------------------|------------------|----------------|
| None | 42 | 14.5 |
| One Module | 31 | 10.7 |
| Two Modules | 39 | 13.5 |
| Three Modules | 99 | 34.3 |
| Four Modules | 78 | 27.0 |
| Total | 289 | 100.0 |

It was determined from the study that 85.5% of the Deposit-Taking SACCOs had adopted open source ERP while 14.5% haven't adopted the open source ERP. The level of adoption varied with 10.7% of the respondents indicating that they are using one module of their adopted open source ERP, 13.5% of the respondents indicated that they are using two modules of their adopted open source ERP, 34.3% of the respondents indicated that they are using three modules of their adopted open source ERP while 27.0% of the respondents indicated they are using all four core modules used by financial institutions. These means there is moderately higher adoption and usage of open source ERP among the Deposit-Taking SACCOs in Kenya. The study classified three types of adopters according to the number of modules adopted as earlier adopters, potential adopters and laggards (see figure 2). Earlier adopters – these are Deposit-Taking SACCOs that have adopted and using at least three open source ERP modules which represented 61.3% of the organisations. These are Deposit-Taking SACCOs which are venturesome, interested in new ideas and have embraced change. Potential Adopters - these are Deposit-Taking SACCOs that have adopted and using one or two open source ERP modules which represented 24.2% of the organisations. The potential adopters have the qualities or abilities that may be developed and lead to more increase in numbers of modules adopted. Laggards- these are Deposit-Taking SACCOs that haven't adopted open source ERP which represented 14.5% of the organisations. These are Deposit-Taking SACCOs which are tradition and very conservative. These results are in line with study by Anderson et al. (1998) who

classified two types of adopters “earlier adopters” and “mainstream faculty” on the level of IT use by faculty members at Canadian Research University.

Figure 2. Extent of open source ERP adoption



The study also collaborates with the findings by Véronique (2012) on adoption of photovoltaic in Netherlands where four segments of adopters were created as; voluntary adopters, involuntary adopters,

potential adopters and rejecters. Strategies on factors influencing the rate of adoption of open source ERP can be applied on the Deposit Taking SACCOs that fall in potential adopters and laggard segments.

4.3 Significance of the factor components influencing the adoption-use of open source enterprise resource planning by Deposit-Taking SACCOs in Kenya

4.2.1 Technology Components

The result on Table 3.0 shows the ranked items of technological characteristics influencing adoption of open source ERP in Deposit-Taking SACCOs in descending order of means score. The first indicator is the (TS6) Technology Reliability and Quality with (Mn=4.26, SD=0.745). This implies that 40.8% of the respondents agree that they have implemented Open source ERP because of its reliability and efficient security capabilities. The second technology factor was the (TS5) Technology Trialability with (Mn=4.20, SD=0.697). The ability to experiment with system was a bigger motivator for the Deposit-Taking SACCOs to adopt the system. There were 55.7% of the respondents who agreed with this. The third factor for adoption of open source ERP was the (TS4) Technology Maintenance with (Mn=4.19, SD=0.707). This implies that it is cost effective to maintain open source ERP in the long run as compared to proprietary ERPs. There were 55.7% of the respondents who agrees with this.

The study findings support that of Chaiwoo and Coughlin (2015) who found out the compatibility with existing standards in the organization system, trialability of the new system were some of the major drivers to adoption of open source software by organisations. It further corroborates Premkumar et al, (2003), Ramdani et al 2003, Kendall et al. (2001), argument that perceived reliability, scalability, low switching cost ease of maintenance and compatibility of open source technologies, are technological drivers to adoption of enterprise resource planning and open source software technologies by organisations.

Table 3.0 Technology components influencing open source ERP adoption

| Measurement components | Min | Max | Mn | SD |
|---|------------|------------|-----------|-----------|
| (TS6)Technology Reliability and Quality | 1 | 5 | 4.26 | .745 |
| (TS5) Technology Trialability | 1 | 5 | 4.20 | .697 |
| (TS4)Technology Maintenance | 1 | 5 | 4.19 | .707 |
| (TS3)Technology No. Termination Cost | 1 | 5 | 4.14 | .742 |
| (TS12) Technology with Legacy system | 1 | 5 | 4.12 | .684 |
| (TS2)Technology Switch Cost | 1 | 5 | 4.02 | .839 |
| (TS13)Technology Complexity | 1 | 5 | 3.99 | .899 |
| (TS1)Technology Support Cost | 1 | 5 | 3.98 | .699 |
| (TS9)Technology Easy Compatibility | 2 | 5 | 3.96 | .857 |
| (TS10)Technology Compatibility and staff Skills | 1 | 5 | 3.93 | .916 |
| (TS8)Technology Observability | 1 | 5 | 3.79 | .853 |

| | | | | |
|-------------------------|---|---|------|------|
| (TS7)Technology Skills | 1 | 5 | 3.56 | .985 |
| Valid N (listwise)= 289 | | | | |

Note: Min – Minimum, Max – Maximum, Mn- Mean, SD-Standard Deviation

4.2.2 Organisation Components

The result on Table 4.0 shows the ranked items of organisational components influencing adoption of open source ERP in Deposit-Taking SACCOs in descending order of means score. There are five highly ranked organisational characteristics that were identified as influencing a firm towards open source ERP adoption. The first indicator is the organisation prefers to stick to the tried and tested when implementing new IT solutions (OS18) with (Mn=4.21,SD=0.842). This implies that a firm will preferably choose an open source ERP which has been used successfully by another firm with 46.0% of the respondents strongly agree. The second highly ranked indicator for the adoption of open source ERP was because the organisation wants to be an innovative and cutting edge organisation (OS17) with (Mn=4.19, SD=0.862) and 44.3% of the respondents agree. The finding generally support (Muriithi 2016; Wang *et al.*, 2007; Jeyarajet *al.*, 2006) findings that top management support, the derived benefits from the technology, organisation IT innovativeness and ICT staff skills are the organisational characteristics influencing the adoption and use of open source software’s in firms.

Table 4.0 Organisation components influencing open source ERP adoption

| Measurement Components | Min | Max | Mn | SD |
|---|-----|-----|------|------|
| (OS18)Organisation new IT Solutions | 2 | 5 | 4.21 | .842 |
| (OS17)Organisation innovativeness in IT | 2 | 5 | 4.19 | .862 |
| (OS16)Organisation available IT staff skills & time | 2 | 5 | 4.13 | .905 |
| (OS14) Top Management support | 2 | 5 | 4.12 | .916 |
| (OS21)Benefits to Organisation | 1 | 5 | 4.10 | .908 |
| (OS20)Organisation Size, skills and experience | 1 | 5 | 4.03 | .874 |
| (OS19)Organisation has resources | 1 | 5 | 3.98 | .892 |
| (OS15)Organisation IT capital budget | 2 | 5 | 3.95 | .866 |
| Valid N (listwise) =289 | | | | |

Note: Min – Minimum, Max – Maximum, Mn- Mean, SD-Standard Deviation

4.2.3 Environmental Components

The result on Table 5.0 shows the ranked items of environment components influencing adoption of open source ERP in Deposit-Taking SACCOs in descending order of means score. There were six environment components which were ranked according to their influence to adoption of open source ERP in Deposit-Taking SACCOs. The first highly ranked item was the (ES27) Environment Competition with (Mn=3.95, SD=0.885). This implies that competition within the sector has caused the Deposit-Taking SACCOs to adopt the open source ERP with 42.2% of the respondents agree. The second factor was the (ES24)

environment availability of external vendors for support services with (Mn=3.81, SD=0.923). This infers that the availability of vendors who can support open source ERP adds more demand for adoption of such systems with 39.4% of the respondents agrees. . This is in line with the majority of the study findings (Dibo 2009; Dedrick& West 2004; Kwan & West 2005; Chan 2001) that have reported that competition from the competitors, No legal requirements, availability of generic modules and long-term viability of the platform as key environmental characteristics influencing the adoption of open source software by organisations.

Table 5.0. Environmental Components for open source ERP adoption

| Measurement Components | Min | Max | Mn | SD |
|---|-----|-----|------|------|
| (ES27) Environment Competition | 1 | 5 | 3.95 | .885 |
| (ES24)Environment Availability of external vendors for support services | 1 | 5 | 3.81 | .923 |
| (ES22)Environment No legal and ethical complications for implementing | 1 | 5 | 3.80 | 1.00 |
| (ES23)Environment Availability of IT skilled workers | 1 | 5 | 3.78 | .934 |
| (ES25)Environment comfortable with the Generic Modules to start | 1 | 5 | 3.72 | 1.00 |
| (ES26)Environment Platform viable in long-term | 1 | 5 | 3.71 | .964 |
| Valid N (listwise)=289 | | | | |

Note: Min – Minimum, Max – Maximum, Mn- Mean, SD-Standard Deviation

4.2.4 Individual/People Components (Attitude, Normative structure and Perceived behaviour)

The result on Table 6.0 shows the ranked items of Individual/People components influencing adoption of open source ERP in Deposit-Taking SACCOs in descending order of means score. The Individual People temperament influences were measured using the Decomposed Theory of Planned Behavior (DTPB) latent variables namely Attitude, Normative structure and Perceived Behavioral Control. The first highly ranked people temperament indicator influencing adoption of open source ERP in Deposit-Taking SACCOs in Kenya was the fact that respondents felt that he/she were productive if they use open source ERP compared to other proprietary software(AD29) with (Mn=4.04, SD=0.879). This implies that 35.6% of the respondents strongly agree with this attitude indicator where a person perceives to be useful when using open source ERP. The second highly ranked indicator with (Mn=4.0, SD=0.896) was (AD32) Using open source ERP will fit with the way I work; with 34.6% of the respondents strongly agree. This means

that the user feels that the open source ERP system is compatible with the way the user works meaning the system is adaptable to user needs. The study findings support that of Anidzaet *al.* (2015), who found out that attitude towards open source technologies had a significant influence towards the adoption of these technologies by individuals. It further corroborates (Al-Mamaryet *al.*, (2014), Park, *et al.*,(2011) Hwang, *et al.*, 2008) argument that attitude, Normative structure and perceived behavior control factors have positive influence towards adoption of open source technologies.

Table 6.0 individual/people components for open source ERP adoption

| Measurement component | Min | Max | Mn | SD |
|---|-----|-----|------|------|
| (DPBAPU29) I'm productive if I use open source ERP compared to other proprietary software | 2 | 5 | 4.04 | .879 |
| (DPBACo32)Using open source ERP will fit with the way I work | 1 | 5 | 4.00 | .896 |
| (DPBNSPI35)Workmates think that I should use open source ERP | 1 | 5 | 4.00 | .924 |
| (DPBNSPI34)Friends think that I should use open source ERP | 1 | 5 | 3.98 | .909 |
| (DPBAPE30)I find open source ERP easy to do what I want the software do | 1 | 5 | 3.96 | .847 |
| (DPBNSSI37)I will have to use open source ERP because my superiors at work require it | 2 | 5 | 3.96 | .898 |
| (DPBPBSRFC40) The equipment required to run open source ERP is not expensive | 1 | 5 | 3.95 | .858 |
| (DPBPBSTFC41)open source ERP software is compatible with software I use | 1 | 5 | 3.92 | .827 |
| (DPBAPU28)The open source ERP would give me greater control over my tasks than proprietary ERP software | 1 | 5 | 3.92 | .898 |
| (DPBAPE31)It's easy to become skillful at using open source ERP | 1 | 5 | 3.91 | .891 |
| (DPBNSSI36)Superiors at work think that I should use open source ERP | 1 | 5 | 3.90 | .921 |
| (DPBACo33) Perceived Ease of Use & compatible my work | 1 | 5 | 3.88 | .869 |
| (DPBPBSSE38)I would feel comfortable using open source ERP on my own | 1 | 5 | 3.87 | .888 |
| (DPBPBSSE39)I could easily work with any open source ERP on my own if wanted to | 1 | 5 | 3.86 | .896 |
| Valid N (<i>listwise</i>) = 289 | | | | |

Note: Min – Minimum, Max – Maximum, SD-Standard Deviation

5.0 Conclusions and Recommendations

The results obtained from this study indicated that technological trialability, no termination cost, low switching cost, low technology complexity, ease of compatibility with existing organisational software and reliability and quality were found to be the most important technological factors influencing the adoption and use of open source enterprise resource planning by deposit taking saving and credit cooperative societies in Kenya. The cheap support cost for open source ERP and the cost effectiveness to maintain an open source ERP in the long run were the main technological factors found to influence the adoption of open source enterprise resource planning software among the deposit taking saving and credit cooperative societies in Kenya. The top management support for the adoption and use of open source enterprise resource planning software was found to play a pivotal role in organisational factors. The study also found out that, employee skills, software compatibility, software reliability and security capabilities, good performance of the software and the need to be innovative and a cutting edge organisation were the key organizational influencing factors for the adoption of open source enterprise resource planning software. The ability of to easily learn and use, ability to integrate with other systems and ability to experiment before implementation were identified as the key environmental influencing factors for the adoption of open source enterprise resource planning software among the deposit taking saving and credit cooperative societies in Kenya. The study also identified that with the availability of support vendors for open source ERP and availability of online support community, due to these environmental factors, Deposit-Taking SACCOs are more willing to adopt open source enterprise resource planning software.

The study also identified individual/people based factors centered on their attitudes, normative structure and perceived behavior that would influence their adoption of open source enterprise resource planning software. The first factor was attitude factor that individual belief that they are more productive while using open source enterprise resource planning software as compares to use of proprietary ERP. Other personal driven factors identified were; how easily open source ERP would fit into personal working style, meaning that a people felt that the software was compatible with their style of hence influence to adoption. The facts that workmates and friends think that their colleagues and friend should use open source ERP was found to be a major influence on perceived behavior and drive to adopt the software. The study found out that personal attitude, normative structure and perceived behavior played an important role on personal influence to adoption of open source software enterprise resource planning.

The study concludes that Deposit-Taking SACCOs in Kenya have adopted the open source enterprise resource planning system for Accounting and Finance management (AFM), Human Resource management (HRM), Procurement Management (SRM), and Customer relation management (CRM). The

SACCO management and policy makers should put more effort on the high ranking factor components to attract the SACCOs which haven't adopted (laggards) and increase the adoption-use of open source ERP by deposit taking SACCOs in Kenya.

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