

# InterPARES Trust

## Project Report

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## Document Control

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1	November 27, 2017	T. Kalusopa, T. Mosweu & S. Bayane	Compiled and summarized the major highlights of phases 1, 2 and 3.
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## Abstract

This study examines enterprise-wide systems and ECMs in Botswana's public service, and attempts to discern whether these instances are also cloud computing based. It draws on a literature review, legal analysis and survey in order to examine the state of enterprise-wide systems and ECM applications in the Botswana public service; to determine their relationship (if any) to existing archives and records management (ARM) practices; and to contextualize these enterprise-wide systems and ECM applications with acknowledged ARM challenges in Botswana and Africa.

The study identified a large number of enterprise-wide systems in the public service of Botswana and was unable to discern whether any of them were cloud-based. In addition, their connections to ARM practice were not always clear, given Botswana's interest in tying its ICT and e-government initiatives.

The study recommends for the need to exploit Government of Botswana's seeming willingness to take on public sector reform that underscores the need to entrench information and records management systems that would ensure digital records provide evidence and authenticity that support the e-government drive. It is hoped that this report will provide evidence and lay the future foundation for the integration of ARM practice in the Botswana e-government programme and lend lessons to other African countries.

**Keywords:** Cloud-Computing; ICTs, ECMs, Enterprise-wide systems, digital records, public sector, Botswana

# Investigating the management of digital records in enterprise-wide systems: Botswana

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## Introduction

This study is part of InterPARES Trust (IP Trust) 4 projects which is a multi-disciplinary and multinational research project that explores issues concerning digital records entrusted to the Internet world-wide. The Botswana Team research focus is on Implementation of enterprise-wide systems to manage trustworthy digital records in Botswana's public sector. The report presents in brief related to the legal analysis, literature review and annotated bibliography, baseline survey.

## Background

Botswana is a southern African nation of just over 2 million people. Although small by population, it exerts an outsized influence in comparison to other African nations when the state of its public service is considered (Lewin 2011). For this reason, coupled with its well-regarded archival service, it forms an excellent country in which to study the intersection of digital records management (RM) and public services.

Like many other African nations, Botswana is currently implementing Information Communication Technologies (ICTs) in its public service in pursuit of e-government, or public services accessible by citizens via ICTs. As part of this transition, Botswana is grappling with a change from manual recordkeeping practices to digital ones, where records might be supported by ICTs or generated within ICTs themselves. ICTs that manage or contain multiple kinds of records are often known as Enterprise Content Management systems, or ECMs. ECMs can be defined as:

“The strategies, methods and tools used to capture, manage, store, preserve and deliver content and documents related to organizational processes. ECM tools and strategies allow the management of an

organization's unstructured information, wherever that information exists."  
(AIIM 2010)

Enterprise-wide systems exist in Botswana and are a key part of the public service. They are aspects of Botswana's deep and continued interest in the expansion of its e-government services. Botswana's public institutions are managed in a hybrid manual-electronic system, with opportunities for improvement and increased focus on digital RM. The legal context of ARM in Botswana is strong at the national level, but some key pieces of legislation, such as FOI and Access to Information, remain to be implemented. Botswana's ARM education programs, although recognized as strong, have not been effectively utilized for the benefit of the public service, most notably due to failures on the part of government to retain staff. The e-government ICTs have penetrated many or most of Botswana's public sector institutions, even if they do not necessarily interoperate with ARM systems. The review also identified a large number of enterprise-wide systems in the public service of Botswana, it was unable to discern whether any of them were cloud-based. Further their connections to ARM practice were not always clear in that Botswana has a stated interest in tying its ICT and e-government initiatives to ARM (Botswana Government 2011), providing hope for progress in this area. The literature review also showed that the state of digital RM in Botswana presents contrasts in that in some cases it exists may be partial or limited. Moatlhodi (2014:123) sums up the state of digital RM well by arguing that at the, the overall records system in Botswana was a hybrid manual and electronic practice. Therefore, although Botswana has good ICT infrastructure, forward-looking and active policymaking, and strong educational infrastructure on which to draw, it has not effectively capitalized on these strengths when it comes to digital ARM.

## Objectives

The goal of this project was is to address the following objectives;

1. To examine the state of enterprise-wide systems and ECM applications in the Botswana public service.
2. To determine their relationship (if any) to existing archives and records management (ARM) practices.
3. To contextualize these enterprise-wide systems and ECM applications and discern the current and future capabilities of using cloud computing.

## Research Methods and Implementation

The project was executed following the four stages depicted in Figure 1;

### **Phase 1: Literature Review**

A review of the literature on enterprise-wide systems and ECMs in Botswana's public service was done to discern any cloud-based cases. The bibliography covers over 50 published articles to examine the state of enterprise-wide systems and ECM applications in the Botswana public service; to determine their relationship (if any) to existing archives and records management (ARM) practices; and to contextualize these enterprise-wide systems and ECM applications with acknowledged ARM challenges in Botswana and Africa.

### **Phase 2: Annotated Bibliography**

The annotated bibliography of the Botswana study was done and thematically covered:

- a) Policies and regulatory framework for the management and preservation of records in Africa
- b) Policies and regulatory framework for the management and preservation of records in Botswana
- c) Implementation of enterprise wide systems to manage digital records in Botswana's public sector.

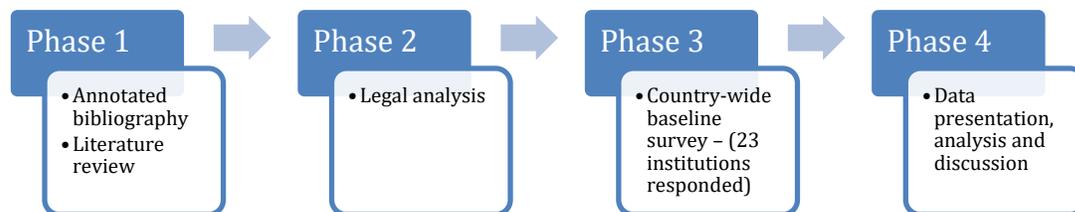
### **Phase 3: Legal Analysis**

The legal analysis revealed that Botswana still lacks behind in the promulgation of legislation that guide the implementation of enterprise wide systems in the Botswana public sector with regards to the issue of trustworthiness. Data protection and Freedom of Information legislations have not yet been enacted. Legislation recognizing electronic records as evidence and in e-commerce transactions is in place in the form of the Electronic Communications and Transactions Act, which gives electronic signatures the legal equivalence to the handwritten signatures and is meant to promote a technology-neutral legal framework for the creation of e-signatures. It also gives legal recognition to certificates created or issues locally or externally. In addition, the Electronic Records (Evidence) Act provides for the admissibility of electronic records as evidence in legal proceedings and authentication of electronic records. There is still need to amend existing legislation such as the National Archives and Records Services Act and the Cybercrime and Computer Related Crimes Act to accommodate the management of electronic records in the country.

### **Phase 4: Baseline on ECM Implementation in Botswana**

Phase 4 of the Project sought to collect baseline data of institutions which actually have ECMs within Botswana. The institutions targeted include public sector, private sector and quasi-government. Botswana is currently grappling with ICTs that manage records. Digital records may be generated within ECMs, managed by ECMs optimized for recordkeeping, or may require intervention both to identify records as records and to place them in an environment where they can be managed (such as an Electronic Document and Records Management System (EDRMS)). Additionally, some organizations may utilize less specific enterprise wide systems that perform many of the functions of dedicated ECMs. This baseline survey explores the implementation of enterprise-wide systems to manage trustworthy digital records in Botswana's public sector and specifically sought to. The study adopted a survey research design. It was a cross-sectional study undertaken in May 2017. An online web survey was distributed to 50 potential

respondents and 31 responded. An in-depth survey of public sector institutions was done through a Survey Monkey which enabled easy data analysis and presentation of results and reports. A baseline data of institutions which have actually implemented ECMs within Botswana was created. The institutions targeted included public sector institutions, specifically government and quasi-government institutions and the private sector. Figure 1 shows these research phases.



**Figure 1: Research phases**

## Findings

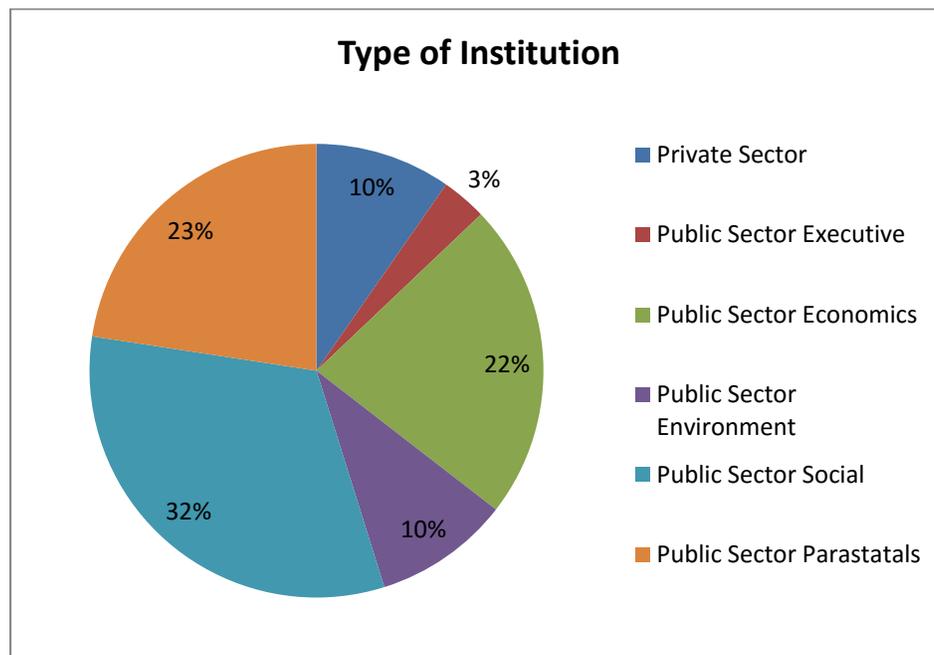
This section presents the results of the study. The team has created a baseline data of institutions which actually have ECMs within Botswana. The institutions targeted include public sector, private sector and quasi-government. This section presents the findings.

### 1. Institutional background information

#### (a) Type of institution

As shown in Figure 2, of the 31 respondents, most 10 (32.6%) indicated that they were from the Public Sector (Executive Branch: Social), followed by 7 (22.58%) from Public Sector (Parastatals/State-owned Enterprises/Independent Offices/Commissions/ Institutions based on Chapters 4, 5, 6 and 7 of the

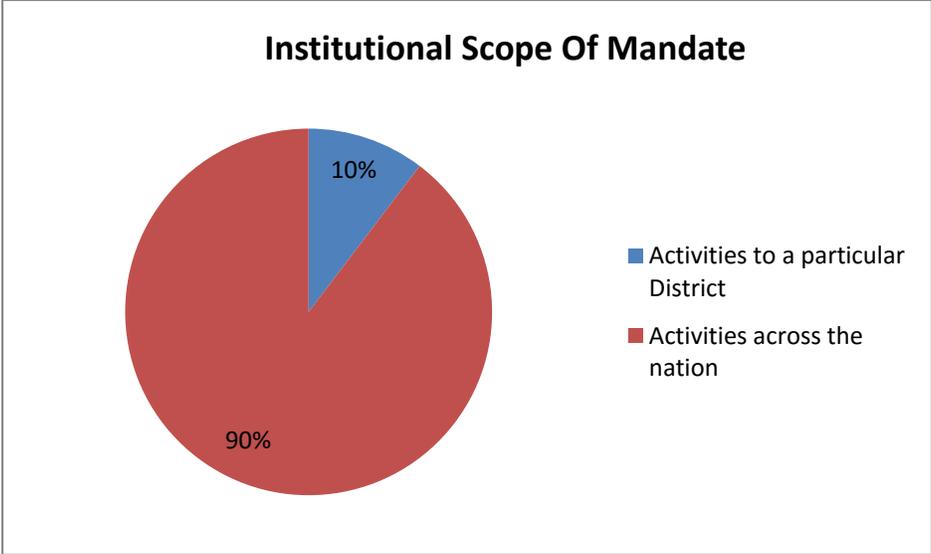
Constitution), 7 (22.58%) from Public Sector (Executive Branch: Economics / Infrastructure), 3(9.68%) from Public Sector –(Executive Branch: Environment / Natural resources), 3(9.68%) from the Private sector while only 1(3.23%) indicated they were from the Public Sector (Executive Branch: Leadership). There were no respondents from Voluntary sector - (i.e. Non-governmental organizations and not-for-profit institutions, Public Sector – Executive Branch: External affairs, Public Sector – Judiciary Branch and Public Sector – Legislature Branch.



**Figure 2: Type of Institution**

**(b) Scope of Institution Mandate**

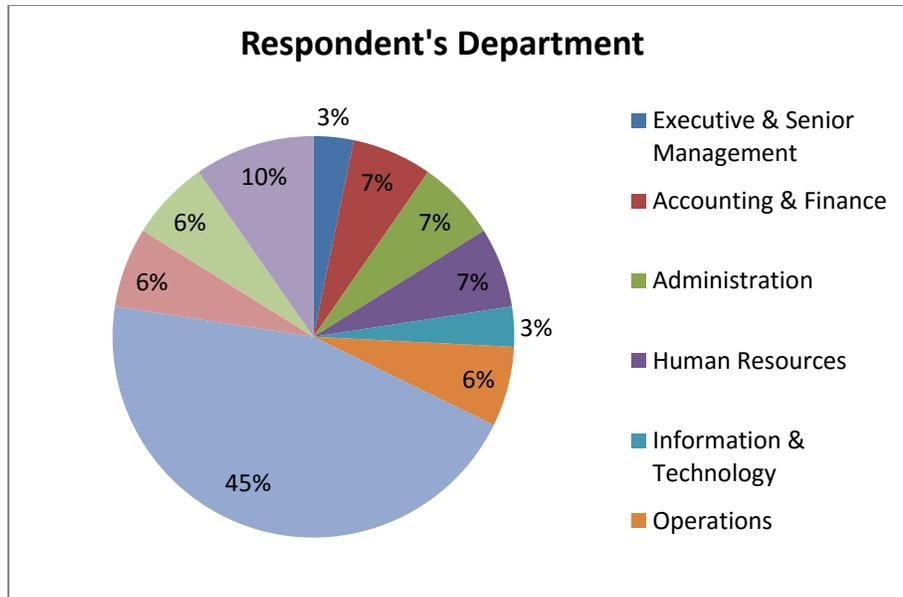
The institutions were asked to characterize the scope their mandate. Only 3(10.34%) indicated that their activities were limited to a particular District while most of the respondents 26(89.66%) indicated that their activities took place across the nation where as two (2) respondents did not respond as shown in Figure 3.



**Figure 3: Institutional Scope of Mandate**

**(c) Location of Respondents in the Institution**

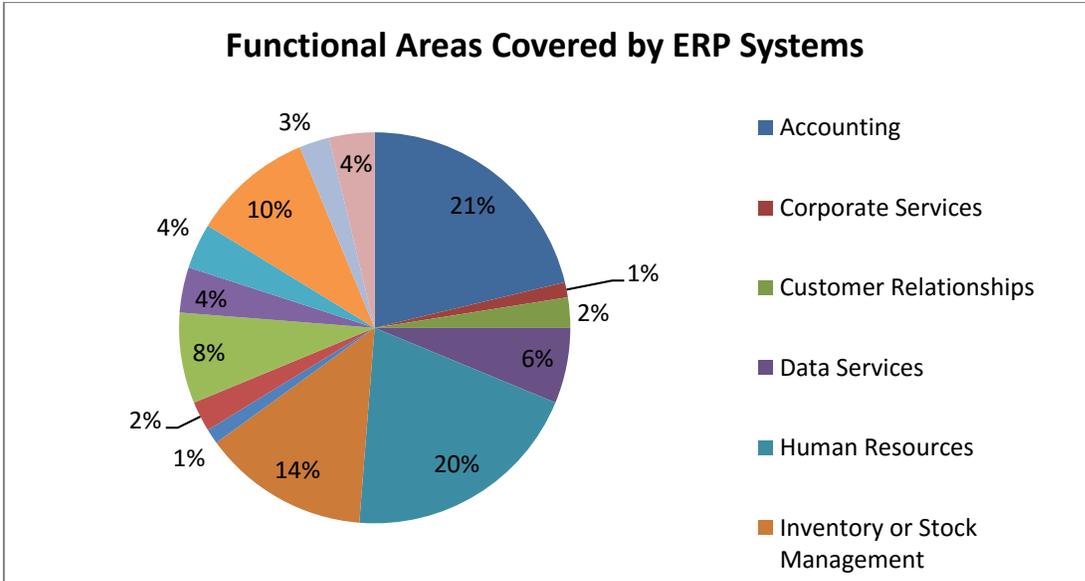
Figure 4 indicates that most of the respondents 14(45.16%) were Records/Archives professionals, followed by 2(6.45%) Accounting/Finance, 2(6.45%) Administration, 2(6.45%) Human Resource, 2(6.45%) Operations (specific to the core business of the institution), 2 (6.45%) were from Technical Services while 1(3, 23%) were from Information Technology and 1(3.23%) came from the Executive/senior management. None of the respondents indicated they belonged to Audit, Communication/Public Relations, Legal Affairs, Marketing/Sales, Policy Development and Planning, Research, Risk and Compliance Management sections/ Departments. 3 (9.68%) chose none of the above stated departments.



**Figure 4: Location of the Respondents**

## 2. Functional Areas Covered by ERP Systems

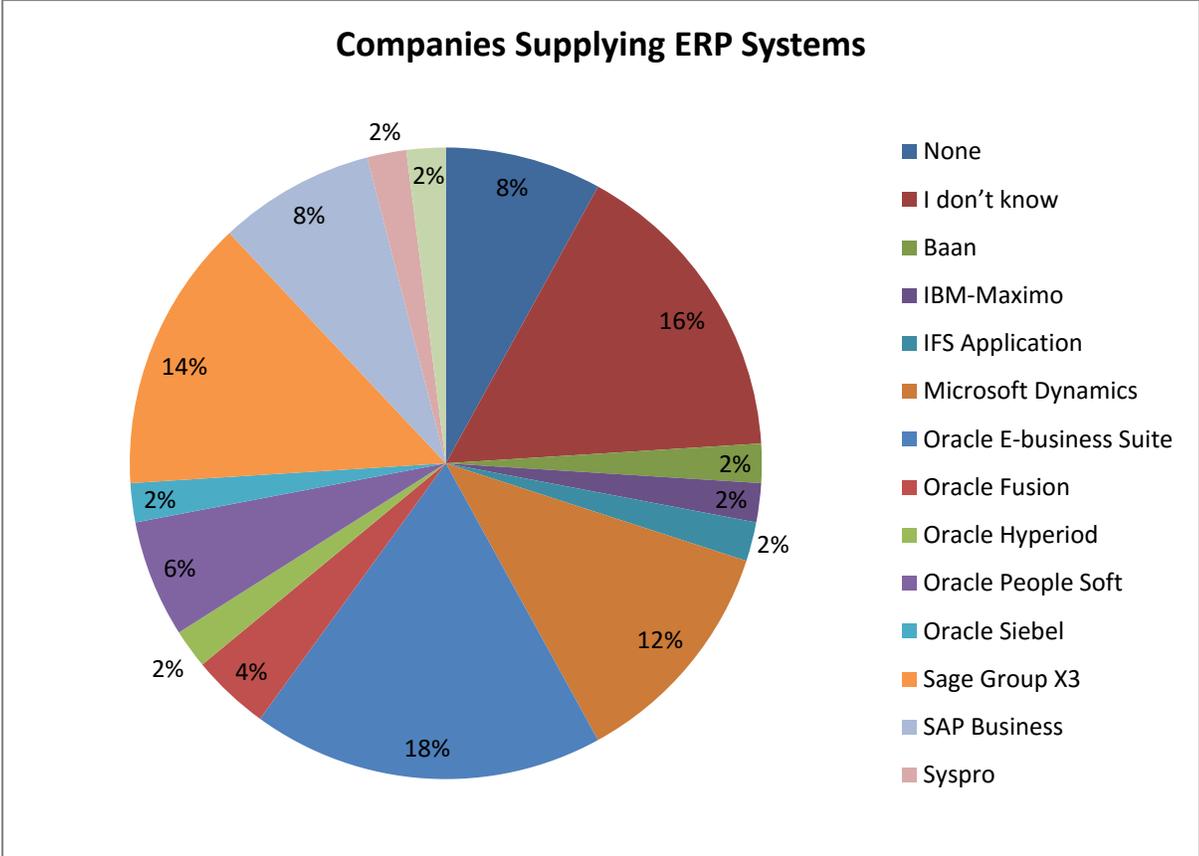
Many institutions have implemented transactional systems such as enterprise resource planning (ERP) systems. These systems are business applications that integrate the management of core business processes. The respondents were asked which functional areas are covered by the transactional system in their institution. Results indicate that Accounting was chosen by most of the respondents 17(54.84%) as a functional area covered ERP systems in their institutions, followed by Human Resources 16(51.61%), Inventory or stock management 11(35.48%), Supply chain management 8(25.81%) operations 6(19.35%), Data services, 5(16.13%), Order Processing and Project management Marketing and sales stood at 3(9.68%) each while 2(6.45%) chose Customer relationship management, another 2(6.45%) chose Marketing and sales. 1(3.23%) indicated Corporate services and another 1(3.23%) indicated Manufacturing. 3(9.68%) of the respondents indicated that they did not know which functional areas were covered by ERPs in their institutions while 2(6.45%) indicated none. The details are shown in Figure 5.



**Figure 5: Functional Areas Covered by ERP Systems**

### 3. Companies Supplying ERP Systems

The respondents were also asked which company supplies the transactional system such as the ERP to their institution. Most of the respondents 9 (29.03%) of the respondents indicated Oracle E-Business Suite as their ERP supplier, 8(25.81%) indicated that they did not know which companies supplied their institutions with ERPs. 7 (22.58%) indicated Sage Group X3 as the supplier, 6(19.35%) Microsoft Dynamics, 4(12.90%) SAP Business, 2(6.45%) indicated Oracle Fusion. IFS Applications, Oracle Hyperperiod, Oracle Siebel, Syspro, IBM Maximo, Baan were chosen by 1(3.23%) each of them. 4(12.90%) of the respondents indicated none of the suppliers while only 1(3.23%) indicated other not on the list. Figure 6 illustrates this.

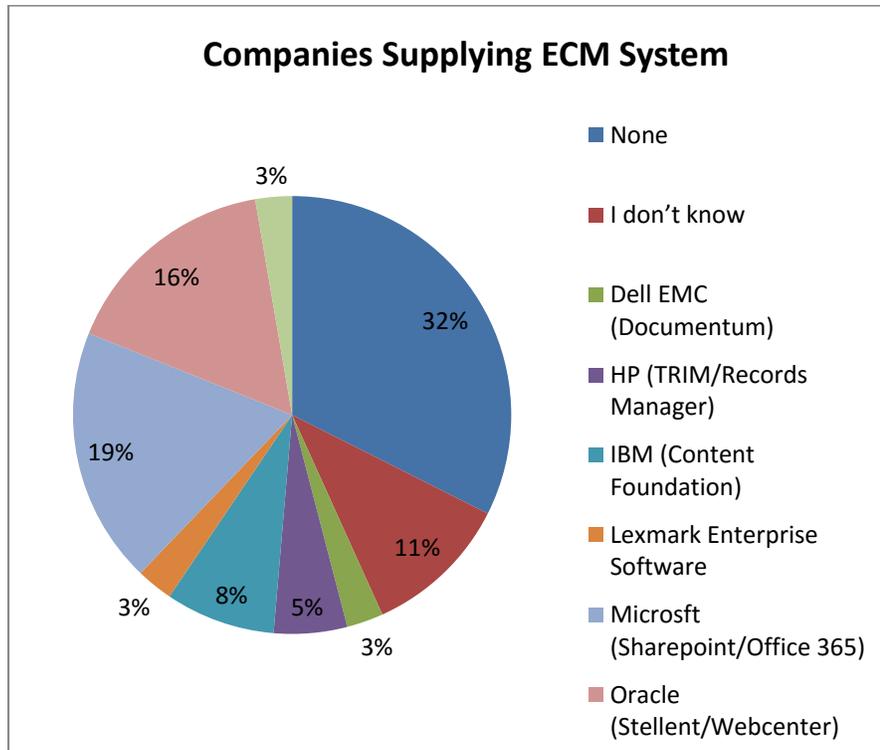


**Figure 6: Companies Supplying ERP Systems**

**4. Companies Supplying ECM System**

The respondents were also asked which company supplies the ECM to their institution. Figure 7 shows that most of the respondents 12(42.86%) indicated none of the companies listed as the suppliers ECM in their institutions. 7 (25.00%) indicated that Microsoft (SharePoint/ Office 365) supplied them with ECM, 3(10.71%) indicated IBM (Content Foundation/ Manager aka Filenet), 2(7.14%) chose HP(TRIM/Records Manager). 1(3.57%) indicated Lexmark Enterprise Software (aka perspective Software) while the other 1(3.57%) indicated Del EMC (Documentum). 4(14.29% of the respondents indicated that they did not know

which company supplied ECM at their institutions. 1 (3.57%) indicated other not on the list.

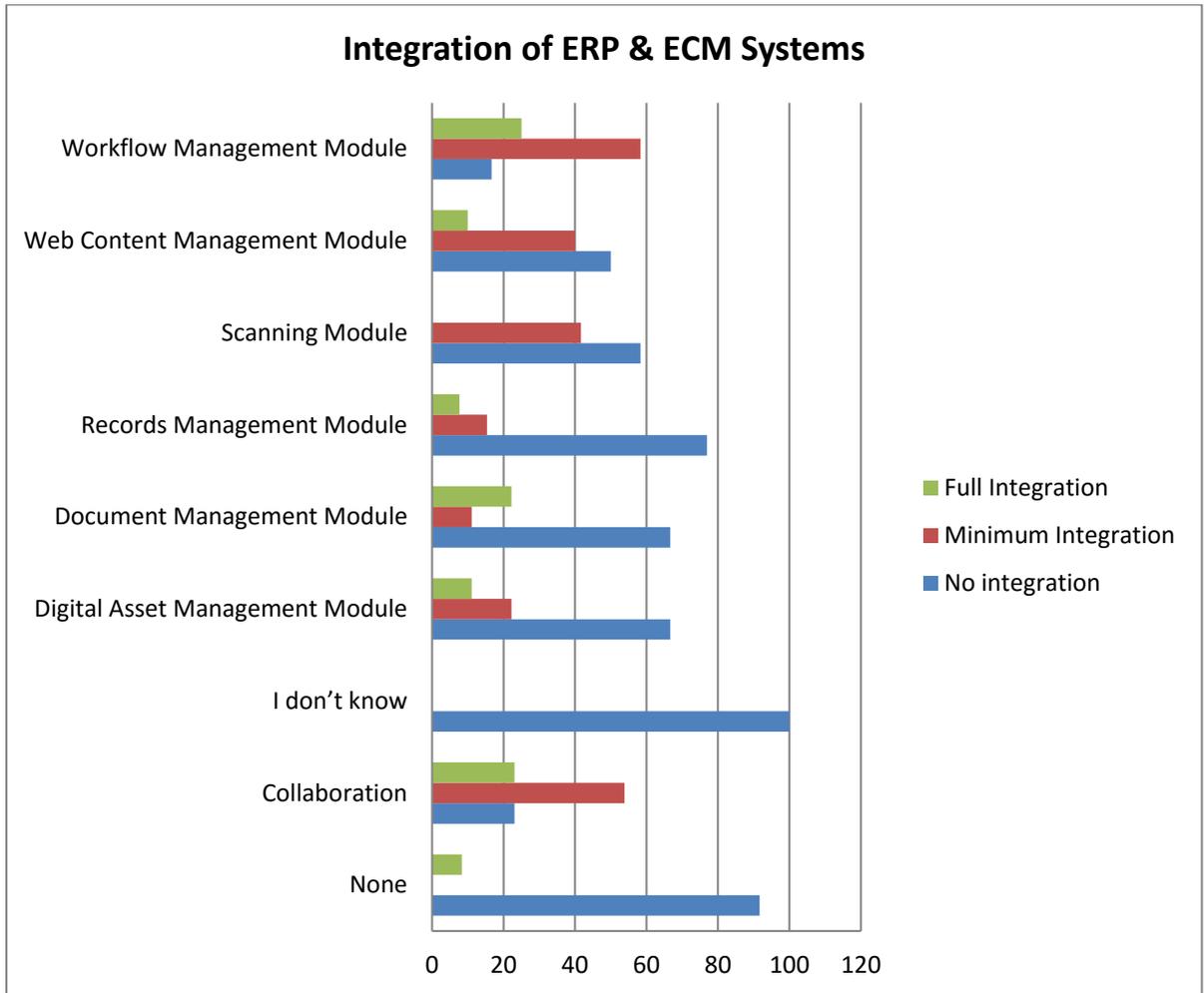


**Figure 7: Companies Supplying ECM System**

## 5. Integration of ERP & ECM Systems

ECM systems often have different modules performing different activities. As well, there are some instances where institutions have integrated their transactional systems such as ERP systems with their ECM systems. This implies that institution could have the different modules to choose that would be implemented. In addition, an institution could have both an ECM system and transactional systems such as an ERP system, and may have significant integration. As shown in Figure 8, there was either no or less integration of the various modules of the ECM. In order, the records management module was not integrated at all, followed by the documents management and digital assets

management modules, then scanning and web content modules. Full integration was greater with the workflow management module

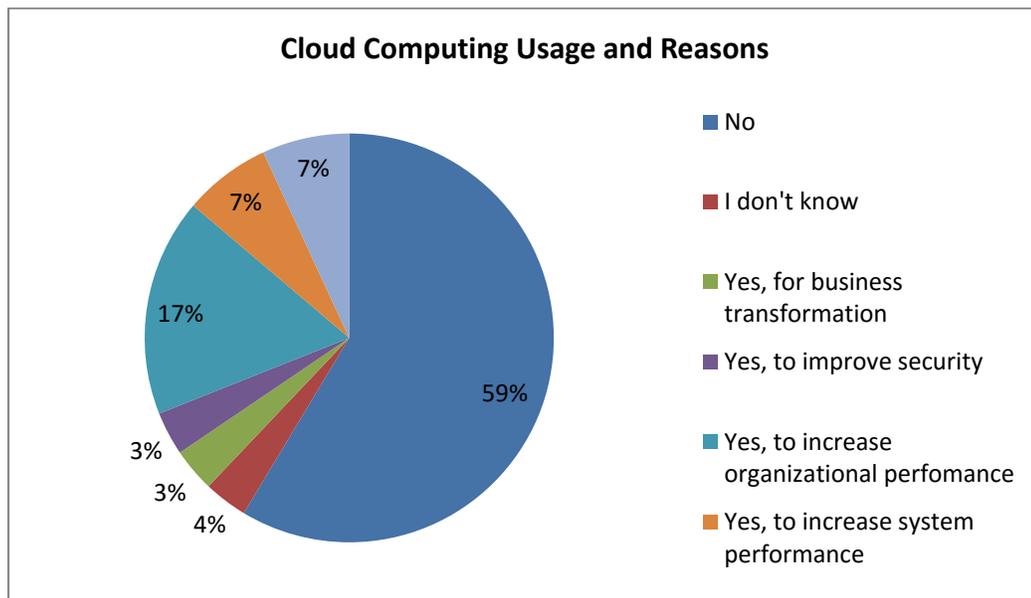


**Figure 8: Integration of ERP & ECM Systems**

## 6. Deployment of Cloud Computing

The study assumes that increasingly many institutions around the world are employing cloud computing which is internet based computing that provides shared computer processing resources and data to computers and other devices on demand. In that regards, the institution ideally will use cloud computing to manage its information assets. The respondents were thus asked to indicate the most important reason why they would use cloud computing.

As presented in Figure 9, out of the 29 respondents who answered this question, most of them 17(58.62%) indicated that they did not use cloud-computing to manage their assets, 5 (17.24%) of the respondents indicated that they use cloud-computing in order to increase organizational performance, 2 (6.90%) showed that they use cloud computing to increase system performance and another 2 (6.90%) indicated that they use cloud computing to increase storage capacity. 1 (3.45%) used cloud computing to drive business process transformation, 1 (3.45%) to improve security while the other 1 (3.45%) indicated that they used they don't whether their institutions used cloud computing or not. None of the respondents indicated that whether they used cloud computing for collaboration, keep pace with the industry or reduce costs. 2 of the respondents did not answer this question.

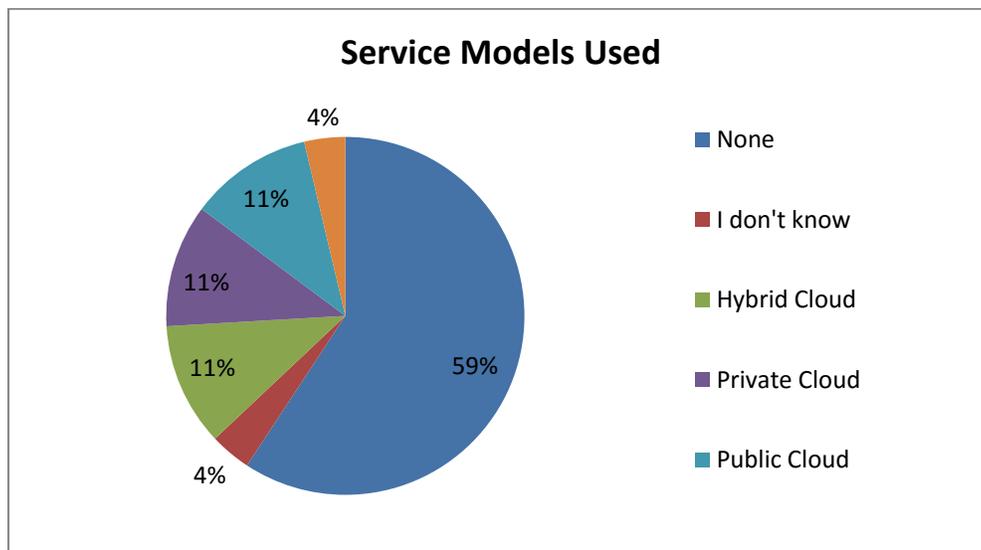


**Figure 9: Cloud Computing Usage and Reasons**

## 7. Cloud Service Models Adopted

The institutions that used cloud computing services were asked to indicate the service models are used in their institutions. Figure 10 shows that 3 (11.11%) of

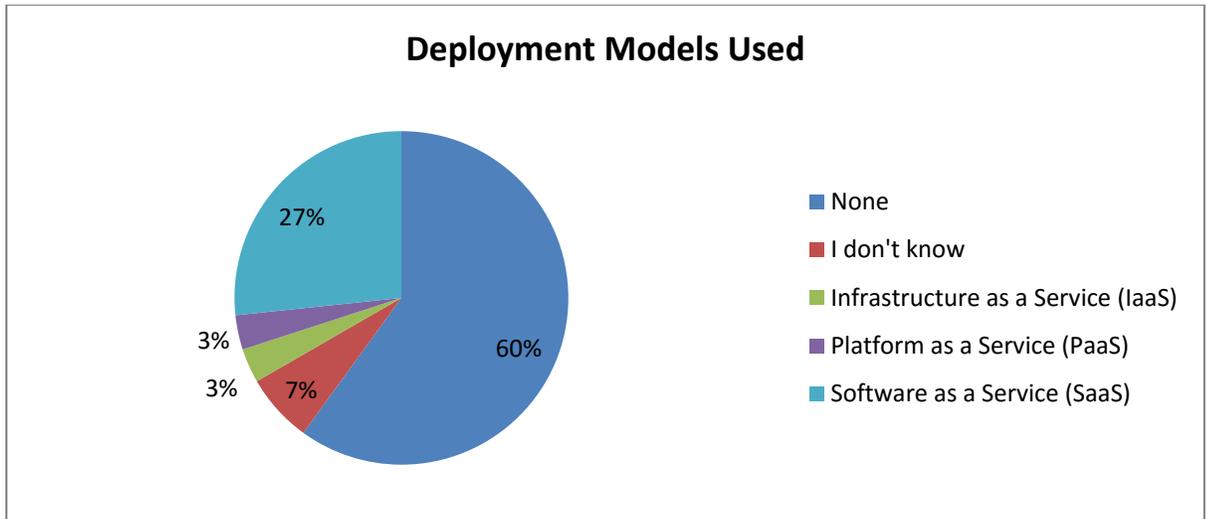
the respondents indicated that used hybrid cloud, 3 (11.11%) private cloud, and the other 3 (11.11%) indicated they used public cloud. Most of the respondents 16 (59.26%) indicated that they used none of the service models outlined. Only 1 (3.7%) showed that they didn't know which cloud service their institution used while the other 1 (3.7%) indicated that they used a combination of two service models. None of the respondents indicated whether they used a combination of three service models or a combination of all four service models. Four (4) of the respondents skipped this question.



**Figure 10: Service Models Used**

## 8. Deployment Models Used

The institutions that used cloud computing services were asked to indicate which deployment models are used for supporting cloud computing in their institutions. Most of the respondents 18(60%) indicated that they used none of the cloud computing deployment models. 8(26.67%) indicated that they used Software as a Service (SaaS), 1(3.33%) showed that they used Infrastructure as a Service (IaaS) while the other 1(3.33%) chose Platform as a Service (PaaS). 2 (6.67%) indicated that they did not know which deployment models were used at their institutions and one ( 1) respondent skipped the question as shown in figure 11.



**Figure 11: Deployment Models Used**

## 9. Conclusion and the Way Forward

Enterprise-wide systems exist in Botswana and are a key part of the public service. They are aspects of Botswana’s deep and continued interest in the expansion of its e-government services. After examining Botswana, the study makes several statements regarding the state of its recordkeeping. For one thing, digital records in Botswana’s public institutions are managed in a hybrid manual-electronic system, with opportunities for improvement and increased focus on digital RM. For another, the legal context of ARM in Botswana is strong at the national level, but some key pieces of legislation, such as FOI and Access to Information, remain to be implemented. Botswana’s ARM education programs, although recognized as strong, have not been effectively utilized for the benefit of the public service, most notably due to failures on the part of government to retain staff. Finally, e-government ICTs have penetrated many or most of Botswana’s public sector institutions, even if they do not necessarily interoperate with ARM systems.

Although this study has identified a large number of enterprise-wide systems in the public service of Botswana, it was unable to discern whether any of them were cloud-based. Although their connections to ARM practice were not always clear,

Botswana has a stated interest in tying its ICT and e-government initiatives to ARM (Botswana Government 2011), providing hope for progress in this area.

The challenges that Botswana faces regarding its ARM, e-government, and ICT initiatives are important, but not insurmountable. The Government of Botswana seems to be aware of them, and its willingness to take on difficult reform issues provides evidence that the future for ARM practice in Botswana is likely to be bright.

## **Products**

1. Annotated Bibliography
2. Legal Analysis
3. Literature Review
4. Survey Report

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