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African E-Government Research Landscape

Cover Page Footnote

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African E-Government Research Landscape

Research Note

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ABSTRACT

Over the past decade, African governments have followed the worldwide trends towards establishing e-government with the aim of improving public service delivery to citizens through the use of Information and Communication Technology (ICT). As a consequence, authors from academia, government departments and agencies, civil society, industry, non-governmental and international organizations have embarked into e-government research focusing on Africa. However, the state of the art of e-government research in Africa is poorly documented. This study analyzes the status of e-government research in Africa. A qualitative technique based on online searches and literature reviews is used to collect data that have addressed any aspect of e-government development in Africa. Thereafter, the content analysis of the reviewed literature is performed. The results of the study show: (1) the growth pattern of Africa e-government research within a period of 10 years from 2002 to 2012, (2) the issues addressed by the researchers on e-government development in Africa, (3) the African countries and regional participation in e-government research in Africa, and (4) the affiliation and expertise of authors undertaking research on e-government in Africa. These results provide useful insights that might be of interest to African governments, industry and academia for the future development of e-government on the continent. Also included in the paper is an annotated bibliography of e-government research.

Keywords

Africa, E-government, ICT in eGovernment, African eGovernment Research.

INTRODUCTION

Across the world, governments are embarking on an exciting journey, *viz*, electronic government (e-government). Heeks (2002) defined e-government as the use of the Internet and World Wide Web for delivering governmental information and services to its citizens. It is regarded as an application of ICT to governance processes and decision-making, in ways that provide opportunities for citizens and communities to regularly receive information about government activities and to participate in decision-making by governments (Kaaya, 2004). The benefits of implementing e-government include long term cost savings and improved service quality (Kaisara and Pather, 2009). Moreover, in today's global economy, high quality e-governmental services can provide a nation with competitive advantage for international business (Onyancha, 2007). The growing adoption of e-government by countries is a testimony to its role as an effective tool for public service delivery (Matavire et al., 2010).

Africa is the second largest continent with about a fifth of the world's total land area and the second most populous continent with one-seventh (about 950 million) of the world's population (Burke, 2012). Africa was once labeled a technological desert with respect to technology adoption and use (Ramessur, 2009). However, in the last decade, African governments have followed the trends towards adopting e-government with the objective of enhancing free flow of information, citizens' participation in the public policy processes, promoting productivity among the civil servants, and improving the delivery of public services (Njuru, 2011). This is witnessed by the initiation of several e-government initiatives across the continent including web sites and portals that promote reasonable access to government information and services by citizens and businesses (Rorrissa and Demissie, 2009). Furthermore, Africa has been one of the most dynamic regions in terms of ICT growth over the last decade; thus it is in this context that e-government in Africa has evolved (Burke, 2012).

E-government research in general investigates the use of information and technology, public policy, government operations, government services, and citizen engagement as the key concepts in the field (Heeks and Bailur, 2007). The main themes in e-government research are: technological innovation and modernization in the public sector, e-government program evaluation and policy analysis, e-participation and digital democracy, e-services and accountability, transparency and the dissemination of information (Bolívar et al., 2010). Interest in e-government research has grown in recent years as governments have viewed it as a lever for changing outmoded bureaucracies, making improvements in the efficiency and effectiveness of public service, enhancing service to citizens and businesses, and promoting participation and democracy (Rowley, 2011). Therefore, conducting research on the emergence of e-government in the African context is critically important not only to capture its history but to identify lessons that will inform future e-government policies and strategy formulation (Burke, 2012).

Understanding e-government research in Africa has not been explored in detail with critics stating that e-government research is generally weak (Heeks and Bailur, 2007). Several studies have explained the quality, rigor and relevance of e-government in Africa (Bolívar et al., 2010). The state of the art of e-government research in Africa is not well documented and existing e-government literature focuses mainly on those from countries abroad (Burke, 2012). The aim of this study is to analyze the status of research on e-government in Africa. The method is based on a qualitative technique using online searches and literature reviews to collect data that has addressed any aspect of the development of e-government in Africa. Thereafter, the reviewed literature is analyzed. The results of the study are used to show: (1) the growth pattern of Africa e-government research within a period of 10 years from 2002 to

2012, (2) the issues addressed by the researchers on e-government development in Africa, (3) the African countries and regional participation in e-government research in Africa, and (4) the affiliation and expertise of authors undertaking research on e-government in Africa. These results provide useful insights that may be of interest to African governments, industry, and academia for the future development of e-government on the continent.

The rest of this paper is organized as follows: Section 2 discusses current African e-government research. The methodology of the study is presented in Section 3. Section 4 presents and discusses the results of the study. A discussion of e-government research in other parts of the world is outlined in Section 5. The conclusion and recommendations are discussed in the final section of the paper.

BACKGROUND ON RESEARCH IN E-GOVERNMENT IN AFRICA

Research undertaken on e-government in Africa has primarily focused on gaining an understanding of the adoption and usage of ICT in governments focusing on exploring the implications of transforming traditional governments to e-government, as well as the challenges and constraints to the implementation and advancement of e-government (Menda, 2005; Ifinedo, 2006; Chango, 2007; Njihia, 2006; Ochara, 2008; Bwalya, 2009; Potnis and Demissie, 2009; Yonazi et al., 2010; Matavire, 2010; Nyirenda and Cropf, 2010; Nabbanja and Bada, 2011; Adeyeye and Aladesanmi, 2011; Dhamodharam and Saminathan, 2011; Gebba and Zakaria, 2012; Eliamani, 2012; Monyepao and Weeks, 2012; Mzyece, 2012; Nkomo, 2012; Azeez et al., 2012). Many papers address the technical design of systems for successful implementation of e-government initiatives (Naidoo, 2006; Sagna, 2006; Chigona and Samaai, 2006; Farelo and Morris, 2006; Ssewanyana, 2009; Jakachira, 2009; Kettani and El-Mahidi, 2009; Ochieng et al., 2011; Karokola et al., 2012; Asongwe, 2012).

Several researchers have proposed models and frameworks for the successful development, monitoring and implementation of e-government in African countries (Trusler, 2003; Lephot and Lerato, 2006; Ezz and Papazafeiropoulou, 2006; Vitali and Zeni, 2006; Gichoya and Hepworth, 2007; Sellami and Jmaiel, 2007; Azaab et al., 2009; Ochara-Muganda, 2010; Ochara-Muganda and Van Belle, 2010; Mishrif and Selmanovic, 2010; Bwalya, 2010; Bwalya and Healy, 2010; Mundy and Musa, 2010; Vencatachellum and Pudaruth, 2010; Fonou-Dombeu and Huisman, 2010; Lin et al., 2011; Al-Khatib and Lee, 2011; Asianzu and Maiga, 2012; Abdelsalaam et al., Ochara, 2012; 2012; Soumia et al., 2012). The preconditions for successful implementation of Africa's current and future e-government initiatives are discussed in Heeks (2002); Misuraca (2006); Schuppan (2008); Ginindza (2008); Gichoya (2009) and Adeyemo (2011).

Various web measurement frameworks were applied to assess African governments' websites' security, usability, user satisfaction, design, and capabilities for marketing online government services to foreign investors (Korsten and Bothma, 2005; Rorrissa and Demisse, 2009; Onyancha, 2007; Yeratziotis and Van Greunen, 2009; Akakandelwa, 2011; Kaisara and Pather, 2011; Pretorious and Calitz, 2011; Rugina and Chachage, 2012).

Viser and Twinomurizi (2006), Pathak et al. (2007), Abrahams and Newton-Reid (2008), Ruhode et al. (2008), Azab et al. (2009), Wangwe et al. (2009), Kaisara and Pather (2009) and Mbwete and Bhalalusesa (2011) discussed e-government strategies and efforts to facilitate e-readiness in African states and ensure that the e-government systems in place are accessible to a broad spectrum of citizens. Lessons that can be learned from African countries that have successfully implemented e-government

for economic diversification and service delivery are discussed in several papers (Awotwi and Owusu, 2008; Bwalya et al., 2010; Nkwe, 2012; Saadi and Almahjoub, 2012; Verma et al., 2012; Baradei et al., 2012; Abdalla, 2012).

Mutula (2005), Mnjama and Wamukoya (2007), Moloji and Mutula (2007), Aregu et al. (2008), Ng'eno (2010), Mutula and Mostert (2010), and Uutoni et al. (2011) proposed the electronic records management (ERM) to support e-government development and show how utilizing digital content could help decrease the digital divide by enabling the public to efficiently access government information. The utilization of information infrastructures such as telecenters and libraries to provide access to information in isolated African rural communities has been discussed (Ngulube, 2007; Aregu et al., 2008; Hallberg et al., 2012).

Studies from an industry perspective have discussed e-government readiness and evaluated the technological and organizational aspects of e-government systems (Vosloo and Van Belle, 2005; Sukhoo and Kurrumchand, 2012). Some studies have outlined the investments made by African governments in telecommunication infrastructure, human capital development, and interactive portal development to achieve higher e-readiness indices (Njuru, 2011; Lubua and Maharaj, 2012).

An open system theory that emphasized the need for continuous interaction between government organizations and the private sector in implementing e-government was proposed by Andersen and Henriksen (2005). This theory has been applied in Dlamini et al. (2010), Cisse (2005) and Dlodlo et al. (2012) to prescribe that e-government implementation be undertaken collaboratively by the public and private sectors to facilitate the modernization of government services.

E-government models, approaches and frameworks related to the use of ICT in the private sector taking into consideration disparities between rich and poor, and urban and rural views of African cultural dimensions are discussed in Easton et al. (2003) and Friedland and Gross (2010). Mohamed (2011) and Weddi (2005) discussed transformation of African governments through e-government and management of the relationship between governments and citizens with effective use of ICT in delivering public services.

Miriam et al. (2009) proposed guidelines for e-government policy and practice in developing countries and exposed the gaps between design and reality in e-government initiatives. E-government artifacts such as websites and e-services connecting government to its citizens are examined in De Tolly et al. (2006) and Wray and Van Olst (2012).

Other studies examined, investigated, and evaluated various aspects of the adoption and usage of ICT in the public sector with emphasis on the technical, user, and organizational aspects of e-government (Jakachira, 2009; Miriam et al., 2009). Maumbe (2009) and Twinomurizi et al. (2012) discussed the analytical frameworks based on the public sector which could be applied to measure the impact of ICTs on government and its societal role and relationships. The impact and implications of e-government initiatives on the structure and functioning of the public sector and the establishment of transformational change in the public sector are also discussed (Bwalya et al., 2011; Ssempebwa and Lubuulwa, 2011; Elkadi and Abdelsalam, 2012). Finally, efforts to prevent corruption, suggesting e-government strategies that standardize and clarify procedures for delivery of government services are discussed in Phala (2007), Grewan (2011) and Cloete (2012).

Burke (2012) used 50 articles published between 2000 and 2010 from Scopus to discuss the state of e-government research in Africa. Although the methodology employed is closely similar to that of this study, Burke (2012) findings are based on a very limited dataset and does not consider important aspects of e-government research in Africa such as: (1) the countries and institutions involved in e-government research, (2) the African and non-African authors undertaking research on e-government, (3) the growth pattern of e-government research, (4) the number of published e-government research articles per African country, and (5) the regional contributions of African countries in e-government research. This study overcomes these shortcomings and provides a thorough and detailed discussion of the state of e-government research in Africa between 2002 and 2012.

RESEARCH METHODOLOGY

Literature Search

Initially, keywords were used in online search engines such as Google and Google Scholar. The keywords included: electronic government in Africa, e-government in Africa, electronic governance in Africa, e-governance in Africa, e-governance in developing countries, e-government in developing countries, electronic government in developing countries and electronic governance in developing countries.

Search Keywords
a) electronic government AND Africa
b) e-government AND Africa
c) e-governance AND Africa
d) internet AND government AND Africa
e) information technology AND government AND Africa
f) digital AND government AND Africa
g) e-services AND Africa
h) e-participation AND Africa
i) e-democracy AND Africa

Table 1: Combined Search Keywords use in the Literature Survey

Thereafter, the search results were expanded by using several keywords combined with the AND operator as shown in Table 1 (Burke, 2012). Secondly, online citation databases such as Science Direct, Elsevier, Emerald, Sage Journals online, Springer Link, Science Target, Scopus and IEEE Xplore were explored to obtain more relevant research. Thirdly, due to the fact that search engines may not find an adequate amount of related literature, the reference sections of the downloaded papers and reports were scrutinized to find relevant literature. Fourthly, specific searches were performed for the individual 55 African states and produced literature that was country specific. Finally, searches were made from the websites of leading E-government and Information Systems journals and conferences. Leading e-government journals included: Electronic Journal of Electronic Government, International Journal of Electronic Government Research, Journal of Electronic Government, Journal of e-Government, Government Information Quarterly, Journal of Government Information, European Journal of Information System, Information Systems Journal, Information Systems Research, MIS Quarterly, African Journal of Information Systems, The African Journal of Information and Communication,

International Journal of e-Business and e-Government Studies, Journal of e-Government Studies and Best Practices, The Electronic Journal of Information Systems in Developing Countries, The Electronic Journal of Information Systems Evaluation, International Journal of Technology and Management, etc. Conferences encompassed: Information Society Technology for Africa (IST-Africa), European Conference on E-government, International Conference on ICT for Africa, International Conference on Theory and Practice of Electronic Governance, International Conference on Digital Government Research and International Conference on Theory, Practice of Electronic Governance, International Conference on Information Resources Management and Hawaii International Conference on System Sciences.

Data Collection

After the search described above, the next step was to delimit the literature. Overall, the preliminary search produced 261 research papers including journal articles, conference papers, research reports, Master's theses and Doctorate dissertations. The number of research papers was then reduced to 216 based on their relevance to the study. This was ascertained by reading their titles, abstracts and conclusions. Thereafter, different perspectives for analyzing the collected e-government research were defined on the basis of the work in Bolivar et al. (2010) including: issues addressed in e-government research, the countries and institutions involved in e-government, the African and non-African authors undertaking research on e-government, the number of published African e-government research papers per year, the number of research papers per African country, etc. This resulted in the list of themes depicted in Figure 1. These themes constitute the perspectives in which e-government research in Africa is analyzed later in this study.

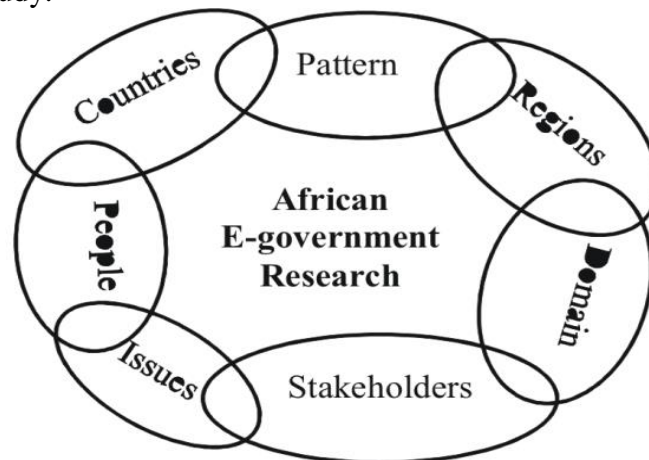


Figure 1: Dimensions of E-government Research in Africa

In Figure 1, Pattern refers to the curve of growth of e-government research in Africa from 2002 to 2012; countries include African and non-African countries involved in e-government research related to Africa; Domain refers to the fields of study in which research on e-government in Africa are been undertaken; People are the authors of e-government research in Africa and Issues are the research problems addressed by these authors; regions refer to African regions involved in e-government research. The Stakeholders of e-government research in Africa are classified into four main categories namely, academia, industry (I), public administration, and civil society. Academic research includes contributions from authors affiliated with universities; the category of industry research encompasses contributions of authors from private companies and non-academic research centers. Public administration research refers to the contributions from authors affiliated with government departments

and agencies, whereas, civil society research refers to contributions from non-governmental organizations (NGOs) (ROP, 2004; ROS, 2004; Lekorwe and Mpabanda, 2007) and international organizations (IO).

Only 24 African countries are involved in e-government research according to the sample of research papers found. Countries represented are: Algeria, Botswana, Burkina Faso, Cameroon, Comoros, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Libya, Mali, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Tunisia, Uganda and Zambia. Further, although significant literature was discovered for these 24 countries, the number of research papers found for some of them was quite low. These countries include: Algeria, Burkina Faso, Comoros, Ethiopia, Mali, Rwanda, and Tunisia, of which only 1 e-government research paper was found. The next section presents and discusses the results of the study.

RESULTS AND DISCUSSION

Stakeholder Contributions in E-Government Research in Africa

On the basis of the categorization of stakeholders presented in the previous section, this study shows that, as expected, the majority of discovered e-government research in Africa is carried out by the academic world with an 82% contribution followed by public administration with a 14% contribution (Figure 2). The latter is 10% more than the contribution of 4% for civil society, i.e., NGOs and international organizations. The industry scored 0% contribution in e-government research in Africa. However, the above findings largely exclude research reports on e-government strategies and policies of African governments. In fact, many African countries have adopted basic legislations, policies, and strategies (Korsten and Bothma, 2005; Rorrissa and Demisse, 2009) for e-government implementation, which may be considered to a certain extent as e-government research results. However, most of these research reports were unavailable at the time of this study due to certain factors such as the low online presence and visibility of African research in general (Burke, 2012) and the language barrier. In fact, this study has only targeted e-government research written in English. Any research written in other African countries' official languages such as Arabic, French, Portuguese, Swahili, etc., could not have been discovered.

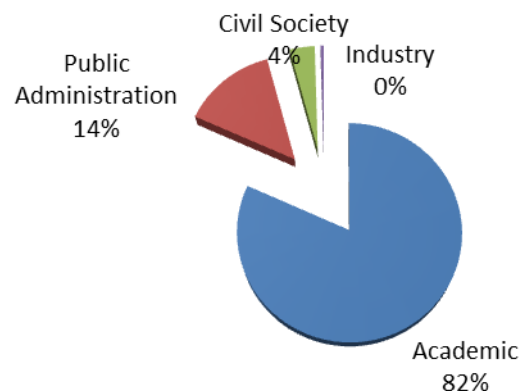


Figure 2: Stakeholder Contributions in E-Government Research in Africa

Public administration's contribution included research from authors from government departments and agencies as in Table 2.

Public Administration Institution	Country
Department of public service and administration	South Africa
Center for e-Innovation (Government Agency)	South Africa
Provincial government of Western Cape	South Africa
Department of economic development and tourism	South Africa
The ICT policy implementation technical unit (Government Agency)	Mozambique
Center for e-Governance (Government Agency)	Ghana
Ministry of finance planning and economic development	Uganda
National health insurance authority	Ghana
Gauteng city-region observatory	South Africa
Ministry of state for administrative development	Egypt
The new vision online (Government Agency)	Uganda
Council for scientific and industrial research (Government Agency)	South Africa
Bureau of statistics (Government Agency)	Uganda
Central informatics bureau (Government Agency)	Mauritius

Table 2: Public Administration Institutions Contributing in E-government Research in Africa

Table 2 shows that authors from only 6 African countries including: Egypt, Ghana, Mauritius, Mozambique, South Africa, and Uganda are affiliated with government departments and agencies. These countries are those with the highest online presence of government departments on the continent (Rossissa and Demisse, 2009).

The civil society and industry institutions contributing to e-government research in Africa including privates companies, non-academic research centers, NGOs, and international organizations are presented in Table 3.

Institution	Classification	Country
Shuttleworth Foundation	NGO	South Africa
L'Evenement	NGO	Burkina Faso
CIO World	NGO	Ghana
Eco perspectives	NGO	Mali
Union for science and technology advancement Africa	NGO	Tanzania
United Nations department of economic and social affairs	IO	United Nations
The World Bank	IO	World Bank
State informatics limited	I	Mauritius
Virginia department of health	IO	USA

Table 3. Civil Society and Industries Contributing in E-Government Research in Africa

Table 3 and Figure 2 show that industry in African countries is not undertaking much e-government research; only 1 research paper discovered was authored from an Information Technology company based in Mauritius. The contribution of both African and Non-African academic institutions (universities) is presented in the next subsection.

Contributions of Academic Institutions in E-Government Research in Africa

Overall, according to the sample papers collected, authors from 50 African universities are conducting e-government research. These universities are distributed amongst 20 countries including: South Africa (17), Botswana (1), Mauritius (1), Namibia (1), Nigeria (4), Zambia (1), Egypt (3), Morocco (1), Tanzania (5), Kenya (1), Uganda (3), Mozambique (1), Lesotho (1), Rwanda (1), Cameroon (2), Ghana (1), Ethiopia (1), Algeria (1), Libya (3), and Tunisia (1). Figure 3 presents the number of African universities publishing e-government research in different countries.

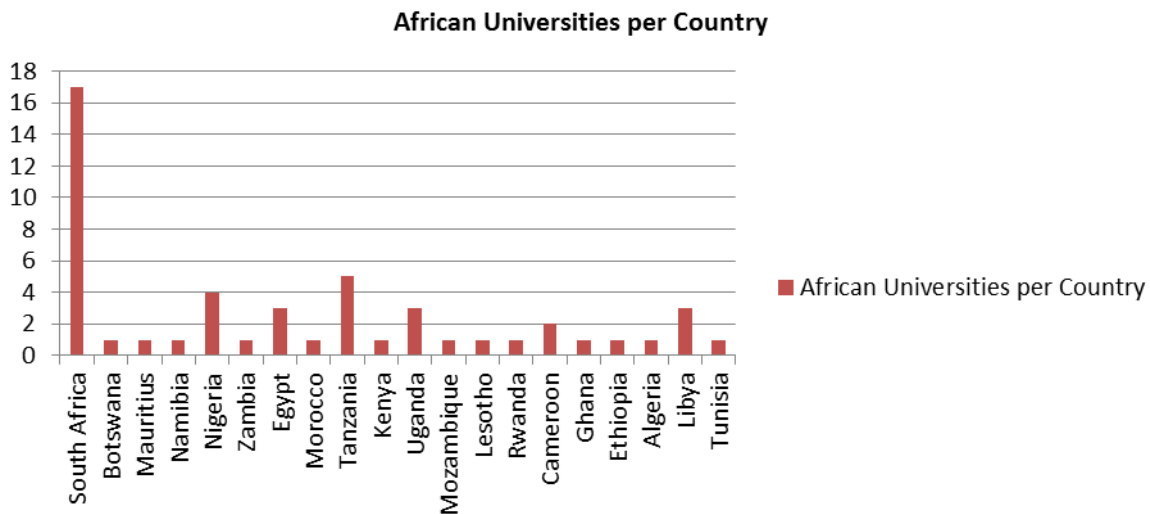


Figure 3: Number of African Universities Contributing to E-Government Research and Corresponding Countries

Authors from 25 non-African universities are also involved in e-government research publications related to Africa. These overseas universities are distributed in 12 countries including: United States of America (7), Germany (2), United Kingdom (6), Netherlands (2), Finland (1), Taiwan (2), Thailand (1), United Arab Emirates (1), Sweden (1), Calcutta (1), Norway (1), and Italy (1). As shown in Figure 4, and as expected, authors from African universities produce more research papers (76%) on e-government in Africa than their counterparts in non-African universities (24%).

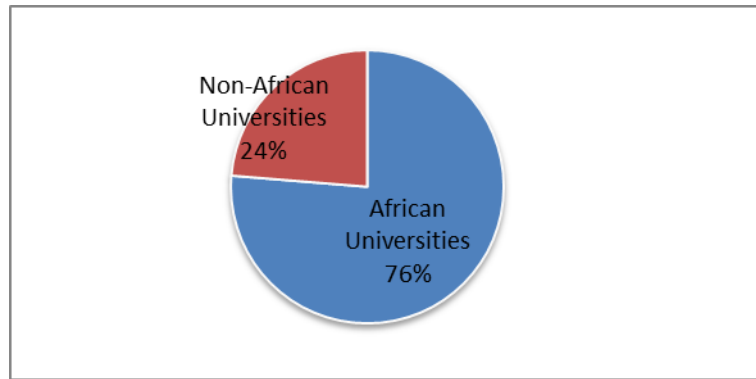


Figure 4: Contributions of African and Non-African Universities in E-Government Research in Africa

The next subsection presents the scale of African e-government research between 2002 and 2012.

Growth Pattern of E-Government Research in Africa

An analysis of the number of research papers on e-government in Africa, published between 2002 and 2012 inclusive, indicates that 2012 was the most productive year with the highest publication rate of 26% (57 publications) (Figure 5). The trend in terms of the number of published research papers from 2002 until 2012 indicates an upward trend except for 2002 and 2004, in which there were 3 published research papers (1.4%). On the other hand, Figure 5 shows that 16 research papers (7%) were published in 2006. This is slightly higher than the numbers for 2007 and 2008, in which 10 (4.5%) and 14 (6.3%) research papers were produced, respectively.

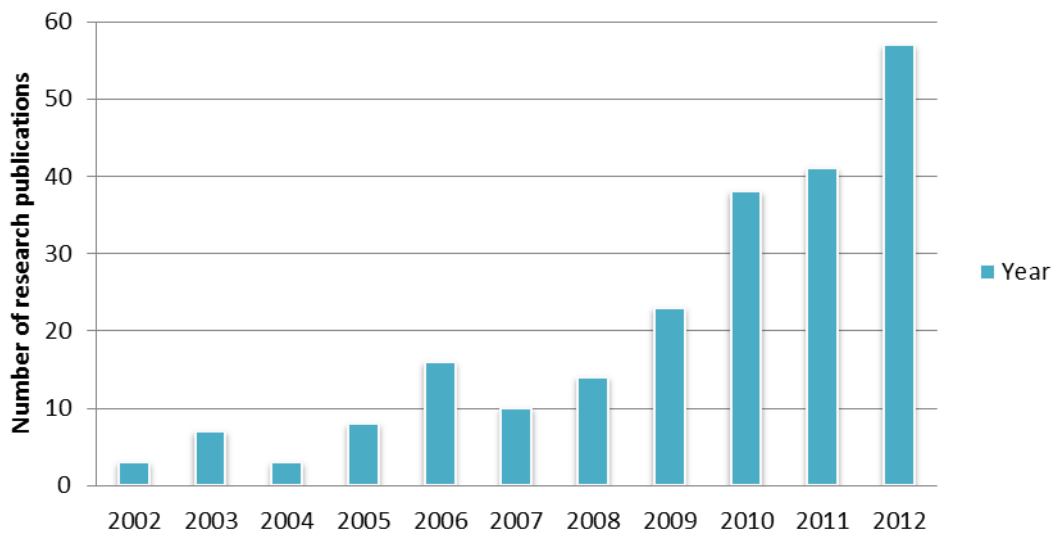


Figure 5: Growth Pattern of E-government Research in Africa

The contributions in e-government research made by different African regions are presented in the next subsection.

Regional Contribution in E-Government Research in Africa

Regionally, Figure 6 shows that all 5 African regions contribute to E-government research in Africa. Southern African is the dominant region with 100 (63.2%) published research papers; the Central Africa

region occupied the last position with 2 (1.2%) published research papers. This indicates that more countries in the Southern African region participate in e-government research as compared to countries in Central Africa. Southern Africa is followed by the Eastern African region, which produced 28 (17.7%) published research papers; the Western African region produced 17 (10.7%) published research papers, which is more than 11 (6.9%) published research papers produced by the Northern African region.

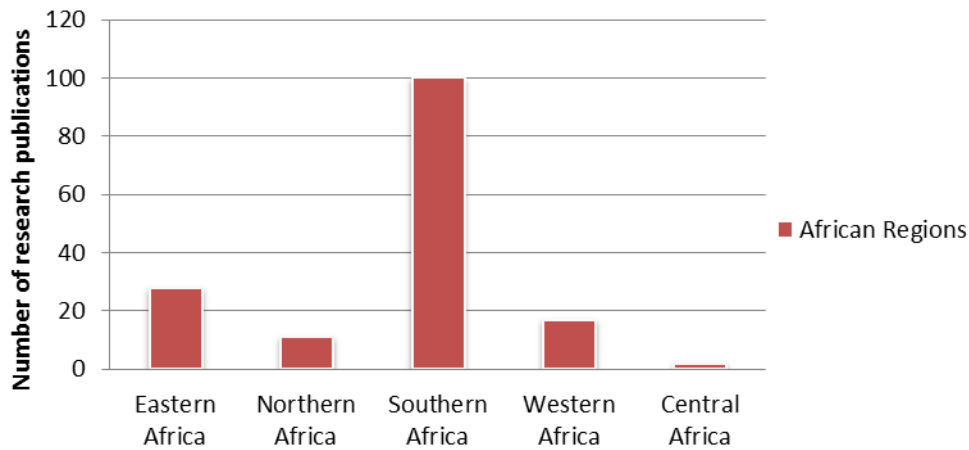


Figure 6: Contributions of African Regions in E-government Research

African countries and their academic institutions participating in Africa e-government research are discussed in the next subsection.

African Countries’ Contributions in E-Government Research

Let’s recall that research papers considered were those where all or part of authors were affiliated with institutions located in Africa. Each paper written by author(s) from an/the same academic institution was assigned to the host country of the institution. A paper with multiple authors from different institutions was shared amongst all the countries hosting these institutions. This decision was guided by the fact that there is no universally approved rule that defines the sequence of authors in a research paper according to the weight of their contributions (Basel, 2013). If an author was affiliated with more than one institution, the paper was assigned to all the host countries of these institutions. Figure 7 shows the distribution of e-government research per African country. South Africa occupies the leading position with 78 (48%) published research papers followed by Uganda, Kenya, and Tanzania with 11 (7.2%), 9 (5.9%), and 9 (5.9%) publications, respectively. Nigeria recorded 8 published research papers. Countries such as Botswana and Mauritius stand with 6 (3.9%) and 5 (3.2%) publications respectively, with Zambia and Egypt having 4 (2.6%) each. Mozambique, Namibia, Ghana, and Libya published 3 (1.4%) research papers each while only 2 (1.3%) research papers were recorded for each of Lesotho and Cameroon. Finally, countries including: Algeria, Burkina Faso, Comoros, Ethiopia, Mali, Rwanda, Senegal, and Tunisia were represented by only 1 (0.6%) research paper each in the corpus of papers found (Figure 7).

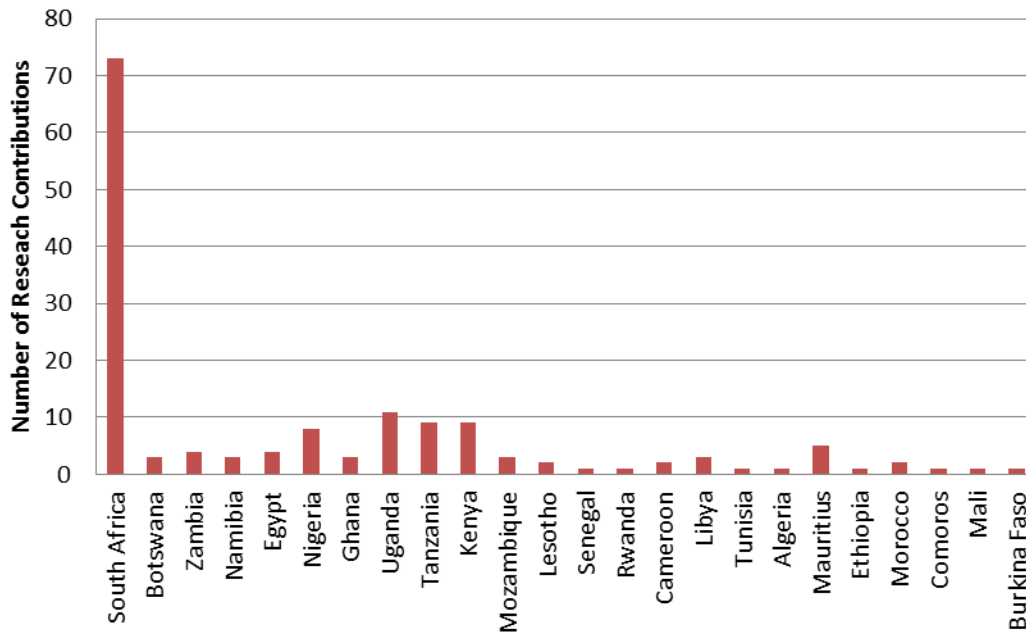


Figure 7: Contributions per African Country in E-Government Research

The disparities of contributions of African regions and countries in e-government research, displayed in Figures 6 and 7, respectively, may be attributed to the fact that this study has focused only on published research written in English. Research written in other African countries’ official languages, such as Arabic, French, Portuguese, Swahili, etc., was not considered. Another reason is the low visibility of African research in general. In fact, African research is poorly documented and often not represented online or indexed in larger research repositories for worldwide access (Burke, 2012). The next subsection discusses different domains under which authors are undertaking e-government research related to Africa.

Domains of E-Government Research in Africa

Figure 8 depicts several domains involved in e-government research in Africa. The study could not assign all the identified research papers (222) in the domains identified in Figure 8; only 93 research papers were allocated to the different domains based on the affiliations of the authors.

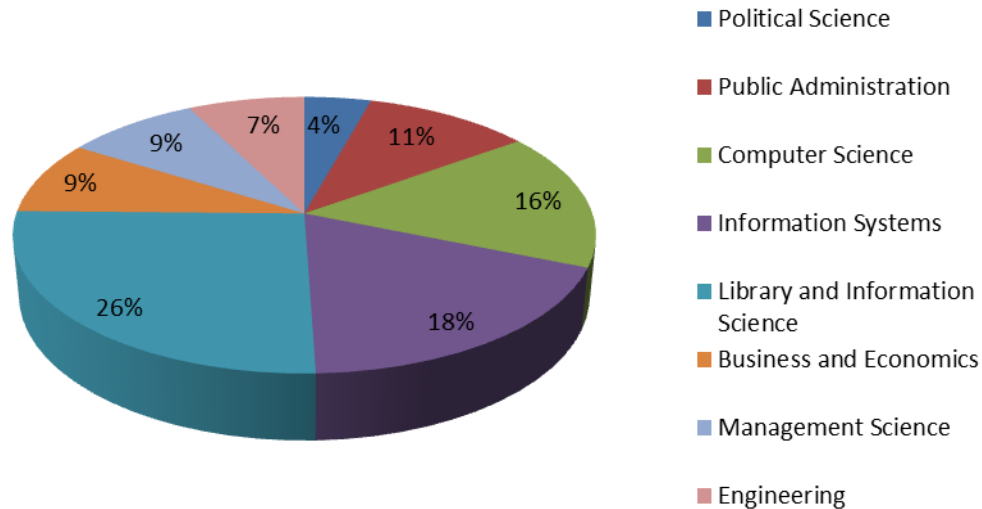


Figure 8: Contributions in E-Government Research per Domain

The domains considered include Public Administration, Computer Science, Information Systems, Business and Economics, Library and Information Science, Management Science, Political Science (Bolivar et al., 2010), and Engineering. It appeared that the largest number of research papers is produced by authors from the Library and Information Science domain; they contributed 26% of the overall publications while the least contribution is from the Political Science domain with a 4% contribution. The Library and Information Science domain was followed by the Information Systems, Computer Science, and Public Administration, which contributed 18%, 16%, and 11%, respectively. An equivalent contribution of 9% was produced by Management Science and the Business and Economics domains. The Engineering domain scored 7% research contribution. Issues addressed in different African e-government research publications are presented in the next subsection.

Issues Addressed in E-Government Research in Africa

Based on the corpus of paper found, authors undertaking e-government research in Africa tackle certain issues as listed in Figure 9. Even though the issues varied from country to country, some were commonly addressed by many authors. This is witnessed by the number of published research papers per issue provided in Figure 9. Challenges and opportunities of e-government in Africa are addressed in 28 research papers. The least addressed issue is the proposal of e-government strategies, which was covered in 5 research papers. Best practices of e-government implementation were covered in 6 research contributions. Furthermore, Figure 9 portrays that evaluation of government websites is covered in 16 research papers. On the other hand, models and frameworks for implementing e-government, and assessment of the state of e-government were covered in 11 research papers, respectively. The implication of e-government on public policy and citizen roles and participation in e-government were covered in 8 research papers, respectively. Lastly, Figure 9 shows that the accessibility of e-government services, analysis of e-government readiness, and usage of ICTs in e-government implementation were addressed in 7 research papers.

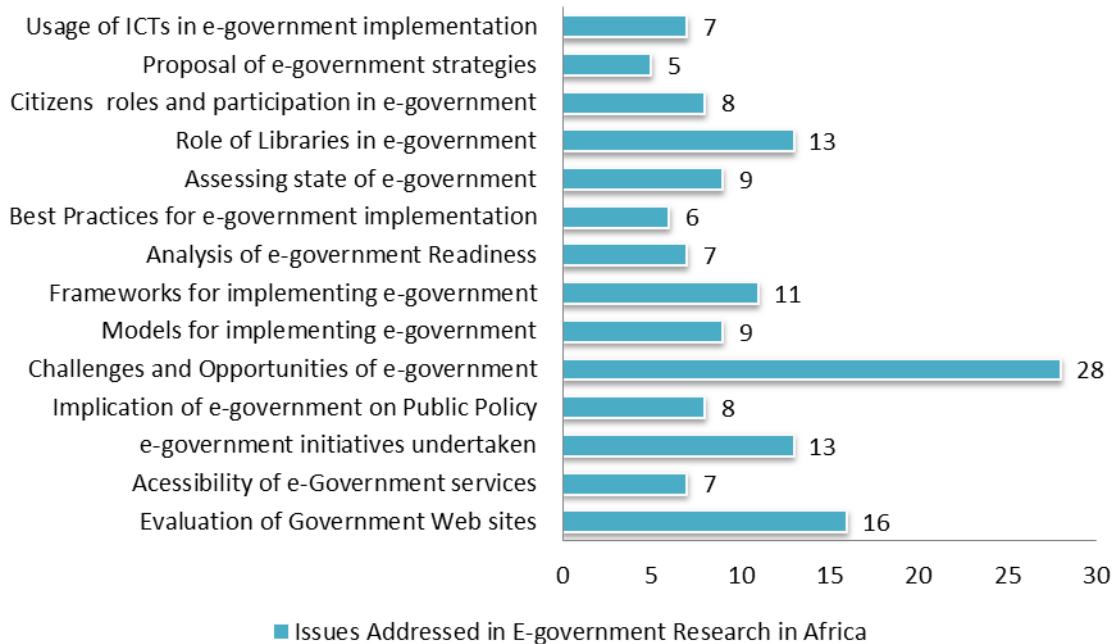


Figure 9: Issues Addressed in E-Government Research in Africa

A discussion of e-government research in other parts of the world is done in the next section so as to compare our findings with other similar studies.

E-GOVERNMENT RESEARCH IN OTHER REGIONS OF THE GLOBE

The state of e-government research in Europe, United States of America (USA), and Australia was presented earlier (Codagnone and Wimmer, 2007). The study discussed funding mechanisms of e-government research in these three regions in terms of: (1) the funding bodies of e-government research, (2) stakeholder participants in e-government research, (3) topics addressed in e-government research, (4) partnership mechanisms between government and stakeholders in e-government research, (5) direction and policies of e-government research, and (6) e-government research programs and strategies. The above items show that e-government research in these regions is well structured. Compared to e-government research in the rest of the world, many African countries do not have any clearly defined direction, policies, programs, or strategies for e-government research and there are no dedicated funds allocated to this type of research. Moreover, it is worth noting that the main e-government research topics or issues in Europe, USA, and Australia (Codagnone and Wimmer, 2007) are largely different from those presented in this study (Section 4.7); this may be explained by the technology advancement in these regions compared to that in Africa as well as the specific social and cultural characteristics of Africa. This has an impact on the nature of issues addressed in e-government research in the respective regions.

Another interesting study by Bolivar et al. (2010) analyzed the trends of e-government research worldwide. The analysis focused on: (1) the growth pattern of e-government research between 2000 and 2009, (2) universities and departments that produced e-government research, (3) authors that took part in e-government research and their affiliations, (4) the subjects or issues addressed in e-government research, and (5) the methodologies employed in e-government research. In their findings, Bolivar et al.

(2010) showed that the outputs of e-government research have increased gradually between 2000 and 2009; this finding is similar to that reported in this study on e-government research in Africa between 2002 and 2012. On a global scale, Bolivar et al. (2010) revealed that the highest number of published e-government research is produced by American universities (45.58%), followed by European (29.36%), Asian (15.64%), Canadian (4.45%), Australian (2.20%), New Zealand (1.39%), South American (0.93%), and African (0.46%) universities; these findings agree with that of this study (Section 4.2) on the overseas countries and universities that are undertaking e-government research focusing on Africa. Furthermore, Bolivar et al. (2010) provided the key domain of expertise of authors undertaking e-government research including: public administration, public and policy, library and information science, computer science and information systems, accounting, business and economics, marketing and communication, and management science; these domains are similar to those discussed in this study in Section 4.6.

Many other studies (Yildiz, 2007; Heeks and Bailur, 2007; Todorovski and Erman, 2009; Goldkuhl, 2012) have discussed e-government research. Authors of these studies mainly analyzed the current literature on e-government research and suggested (1) guidelines for strengthening best practices in e-government research (Yildiz, 2007; Heeks and Bailur, 2007), and (2) methodologies (Todorovski and Erman, 2009) and models (Goldkuhl, 2012) for transforming e-government in an established research field in future where high quality research outputs could be produced. The next section concludes the study and provides some recommendations.

CONCLUSION AND RECOMMENDATIONS

This study analyzed the status of e-government research in Africa. Online searches and content analysis of published research contributions were used to collect the data for the study. The data analysis revealed that the rate of publications of e-government research related to Africa has increased over the past 10 years with 2012 being the most productive year. This trend is expected to grow in the upcoming years and will maintain a desirable path for Africa e-government research. It was also found that only 24 (43.6%) out of 55 African countries are represented in the e-government research that was found, i.e. more than the half of countries on the continent were not represented in the e-government research. This poor visibility of African countries in published e-government research is probably due to the fact that most African countries do not have any clearly defined direction, policies, programs, or strategies and dedicated funds for e-government research as compared to other parts of the world (Codagnone and Wimmer, 2007). Further, the results suggest that most of the current research on e-government in Africa is undertaken by authors affiliated to academic institutions from only 15 (27.3%) countries on the continent; this may be due to common barriers at African universities such as (1) heavy teaching loads for academic staff (large classes and many teaching contact hours), (2) additional consulting work to supplement the low income from academic work, (3) low capabilities/qualifications of academic staff for advanced level research such as Master's and Ph. D. degrees as well as supporting mechanisms for conducting research including funding, publication incentives, conference hosting/participation, etc. (Sawyer, 2004; Kizza, 2011). It was also shown that the industry participation in e-government research is quite low with few contributions from private companies and non-academic research centers. The results also show that the contribution of government departments and agencies in published e-government research on the continent is quite low. This is witnessed by the few contributions from government divisions in only 6 African countries (14%). A regional consideration of African countries portrays Southern Africa as the leading region in terms of e-government research with 63.2% contributions and the least contribution of 1.2% comes from Central Africa. However, it was appealing

to find out that all 5 African regions are involved in e-government research. With regard to stakeholders, the academic world showed the largest contribution to Africa e-government research with African universities showing an upper hand (76% contributions) over universities abroad (24% contributions). Several research domains contributed to e-government research in Africa. However, authors from the library and information science, information systems, and computer science domains produced the largest number of research publications (26%, 18% and 16%, respectively). Similar findings were reported in Heeks and Bailur (2007); Bolivar et al. (2010) and Burke (2012). Finally, several issues were addressed in e-government research in Africa and the challenges and opportunity of e-government for African governments was the most prominent issue; this is in line with the fact that most authors of e-government research focusing on Africa are interested in analyzing the impact of the adoption and use of ICT in government on the continent (Bwalya, 2009; Yonazi et al., 2010; Matavire et al., 2010; Adeyeye and Aladesanmi, 2011; Nkomo, 2012; Azeez et al., 2012).

In light of the above findings, this study makes the following recommendations that would certainly boost the research outputs on e-government in Africa in the long-term and strengthen the capacities of African countries in adopting e-government:

- The establishment of a strong partnership between African governments, industries, and academia for the frequent update and definition of contents of African e-government programs according to the countries' specificities,
- The initiation of mechanisms for financial support of e-government research from African governments, industries, bilateral and multilateral partners,
- The creation of research centers and various institutes specializing in e-government studies, either in government divisions, academic institutions, industries, or non-governmental organizations and
- The initiation of various e-government related workshops and conferences to be organized and held on the African continent.

This study has focused on published research on e-government in Africa written in English only. Related research publications in other African countries' official languages such as Arabic, French, Portuguese, etc. were not considered. The methodology of the study was also undermined by the fact that (1) African research is poorly documented and often not represented online or indexed in larger research repositories for worldwide Internet access (Burke, 2012) and (2) The size and the ever-growing nature of the Internet (Bughin et al., 2011) may have made some sources of relevant publications (conferences, journals, etc.) to be left out at the time of data collection. However, due to the intensity and diversity of the collected research papers for this study, the authors believe that these limitations would not significantly affect the overall findings of this study.

APPENDIX: ANNOTATED BIBLIOGRAPHY

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