ISSN:2321-1156
International Journal of Innovative Research in Technology & Science(IJIRTS)

E-GOVERNMENT ARCHITECTURE MODEL FOR GOVERNMENT-TO-GOVERNMENT DEPLOYMENT OF INTEROPERABLE SYSTEMS, (A CASE STUDY OF COUNTY AND NATIONAL GOVERNMENT IN KENYA)

Mose S.M, Institute of computer science and information Technology, JKUAT; Wafula J.M, ICT Directorate, JKUAT;
Kimani S, Institute of computer science and information Technology, JKUAT, Nairobi.

Abstract

Rapid advancement and innovation of new technologies have led to global revolution on how governments carry out their businesses. Information Communication Technology(ICT) tools used to re-invent the public sector, have led to unprecedented benefits to government, compelling most countries both developed and undeveloped to embrace e-government. Government agencies are deploying new ICT systems with specifications and solutions relevant to their particular requirements. However, they are not paying attention to the need to connect exchange and re-use data within systems, leading to weak interoperability in government. To address the issue of weak interoperability, we developed e-government architecture to enable smooth deployment of interoperable systems between national and county governments. E-government architecture acts as an information management and planning tool to enable government optimize their ICT assets by rigorously analyzing, and identifying strategic opportunities from its various lines of business and business information. This enables the development of appropriate software applications in-line with technology investments. The exploratory research design and case analyses were used. The output of this research was designed e-government architecture for a devolved government; county and national government.

Introduction

Information and communication technologies provide both developed and developing nations with an unprecedented opportunity to meet vital development goals, via the appropriate utilization of technological tools. There is increasing evidence that e-government, if well implemented strategically, can improve efficiency, accountability and transparency of government processes (Parrish, 2006; Signh et-al, 2010; Hassan et-al, 2011; Bhattacharya et al, 2011 and Haque et al, 2013). However, the full potential of e-governance applications and other ICTs remains to be fully harnessed by developing countries.

For ICT and e-government to work for development, information and knowledge need to flow seamlessly across agency borders and various levels of government, and ultimately different countries, across regions and continents without being locked into specific software packages. Eventually, this will lead to better and more informed decisions, better public service and better governance (Fong, 2007)

In e-government initiative, the key challenge is the existence of patchwork of ICT solutions in different government offices those are unable to talk or exchange data. In the process of digitization, government processes and systems are, in many instances, reinforced rather than transformed. As result, demand to visit different departments to access public services, even after the introduction of ICTs and broadband as systems are not interconnected (Fong, 2007).

Many researchers have defined e-government, but the best suits my area of research is; e-government is the use of ICT tools to re-invent the public sector by transforming its internal and external way of doing things and its interrelationships with customers and the business community (Allen et al, 2010). The analysis of this definition allows one to identify the main issues and components that characterize an e-government framework such as; transformational areas (internal, external, and relational), e-government application domains (e-services, e-democracy and e-administration) and users, customers, actors and their interrelationships.

From (sahraoui, 2007; Signh et-al, 2010; and Haque et al, 2013), the scope of major e-government interactions are; Government to Citizens (G2C), Government to Government (G2G), Government to Business (G2B), Government to Employee (G2E) and Other Governments(OG). In this study I will limit my discussion to Government to Government only (G2G). The G2G sector represents the backbone of e-government. Some researchers suggest that governments at

all levels must enhance and update their own internal systems and procedures before electronic transactions with citizens and businesses are done. So, in the research we focused to cover interoperability of internal systems of government.

Government to Government systems are types of e-government systems that support relation between different structures of government. It helps in sharing some basic information among different governmental bodies which avoids parallel data collections and reduces costs respectively (Haque et al, 2013). The government processes and procedures are simplified to cut the red tape, facilitate delivery of services, increase productivity of the bureaucracy, and increase savings. The transactions between central and local governments, department levels and attached agencies and bureaus, as well as government and its employees would be enhanced.

The internal strategic objective of e-government in government operations is to facilitate a speedy, transparent, accountable, efficient and effective process for performing government administration activities, significant cost savings in government operations. Thus, information can flow much faster and more easily among different governmental departments (Parrish, 2006; Allen et al 2010).

E-governance can be designed to increase competition, reduce discretionary power, remove bottlenecks in routine transactions, increase reliability, and predictability of government actions, to ensure better and equal access to information and services and promote transparency and accountability (Signh et-al, 2010). E-government strategy of Denmark declared "joined up public service" better collaboration, digital exchange of data between agencies as basic objectives of e-government.

From e-governance of Singapore, ICT provide greater accessibility, facilitate wider multi-communication and dissemination of information, provide automatic record keeping features and generally enable better knowledge management and information sharing, increase government productivity(Signh et-al, 2010). It is argued that e-governance can provide a climate of honesty, integrity, trust and participation.

(Haque et al, 2013), discusses the grid technology has the potential to become a ubiquitous electronic services, which can improve infrastructure utilization, increase access and integration of huge amount of data and enable new levels of communication and collaboration between different levels of G2G e-government system. The grid framework optimizes information process management at different levels of government systems and provides rapid access to various levels of data sources available over the network. This framework is applied in Pakistan to address challenges faced by the G2G e-communication and collaboration system i.e. addresses massive requirements of information processing capacity, reduces inefficiency and processing bottlenecks and improves poor utilization of information.

The scope of a grid technology could range from small departmental network to a vast collection of resources and services running in multiple locations, spread across the organization, and owned by many organizational groups, government bodies, and enterprise or academic institutions (Haque et al, 2013). Much of the initial progress with respect to online initiatives focuses internally and externally, on information proving, connectivity and expanding a new internet based infrastructure to citizens, customers and communities. My argument is that before electronic services are expanded to citizens and Businesses the internal electronic administration infrastructure of an e-government should be in place.

In Canada the government is attempting to achieve the internal capacity for an intra-governmental conversation based electronically. Within government, IT fosters new horizontal opportunities by shifting away from traditional bureaucratic structures towards alternative delivery arrangements i.e. e-governance.(Sahraoui, 2007; Bhattacharya et al, 2011; Kangu, 2011; Haque et al, 2013). The manner in which accountability is perceived and exercised by government leaders will determine the degree to which it embraces more collaborative models of governance.

Traditionalists invoke the underlying principle of ministerial accountability based on a clear and rigid view of vertical control and risk minimization, in order to serve and protect the interests of the publicly accountable political leader. The rise of e-governance, with its pressures for variety of initiatives introduces alternative models of decision making and service delivery promoting shared accountability (Allen et al, 2010). The need for collaboration, partnerships and joint ventures grows both within government and often between private and public organization.

(Allen et al, 2010) Asserts that shared accountability ensures better coordination of activities in a more flexible and more effective way, empower public servants and their partners allowing new solutions to come forward in a dispersed and open matter. The opportunities that come along with e-government include; cost reduction and efficiency gains, quality of service delivery to business and customers, transparency, anticorruption, and accountability, increase the capacity of government, network and community creation, improve the quality of decision making, and promotes use of ICT in other sectors of the society. Traditional government is characterized by static and insufficient information that is infrequently updated, few interactive features, and non-existent online services.

In (Signh et-al, 2010) research on how E-governance can be used to fight corruption in India, Ethiopia and Fiji, identifies monopoly of power, discretion, and lack of accountability and transparency to be the key drivers of corruption. (Naz, 2009) emphasized that to tackle these three drivers, a viable anticorruption strategy must be designed as a multi-pronged endeavor that includes a set of complex measures in different spheres of society and state organization. A pure e-governance solution removes discretion from the equation promoting corruption by dis-intermediating services and allowing citizens to conduct transactions themselves.

A number of analysts argue that to maximize the potential benefits from e-governance applications, transparency need to be consciously built into the public service delivery system beginning from the design and planning phase. The Thailand government uses the E-Thailand system to improve public administration and to support the economic and social development of the nation (Signh et-al, 2010). Use of ICTs in government sector is now well established and had been an integral part of how governments do business in countries like; Australia, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Mexico, Netherlands and the united states. There is scarcely an aspect of government activity that does not involve the use of ICTs (Haque, 2013; Fong, 2007).

According to the constitution of Kenya 2010 (COK, 2010), Kenya adopted a multidimensional approach to the organization of governance and management of state power. It combines vertical and horizontal dimensions and forms the foundation of the devolved system and structures of government. The two levels of governments can be described as being distinct and inter-dependent and which conduct their mutual relations on the basis of consultation and co-operation (Kangu, 2011).

Kenyans, through Article 4 of the COK 2010, adopted republication as a key value foundation. In several other articles, the various other doctrines include; openness, transparency and accountability as opposed to secrecy in governance. It is for this reason that Article 35 of the COK 2010 makes provision for the right of access to information held by state. According to Articles 6(2) and 189(1) (b) and (c), inter-dependence requires that the two levels of government liaise with each other for the purpose of exchanging information, coordinating policies and administration and enhancing policy.

Counties will compete and cooperate with and between themselves if they are to achieve the desired development outcomes. The effectiveness and efficiency with which public services are provided to support inclusive growth, economic innovation and competitiveness and maintaining quality places will be essential to the success of the counties (Kangu, 2011).

The promotion of various forms of development activities and goals, in one way or another, will require the inclusion and full integration of communication and information. (Kangu, 2011) information is power, and power to influence public policy decisions is the right to every citizen. For effective participation to benefit society it must rely on accessible, timely, accurate and user friendly information. Therefore, both national and county governments must embrace the central roles of communication and information in their broader meaning.

It is considered that both national and county governments can benefit in using the wider reach of effectiveness of both the print and electronic media in sharing extensively on various aspects of their government. (Allen at el, 2010) considers this means to have limitations because of their static and insufficient information that is infrequently updated, few interactive features, and non-online services, especially with the advent of new technologies and broadband of higher speed.

Streamlined sharing of information between government agencies to conduct government –to-government (G2G) simplify the navigation of government-to-citizen (G2C) and government-to-business (G2B) transactions (Haque et al, 2013). The role of communication and information remains a critical component of generating information needed for decision making processes, analysis and interpretation of core issues of governance (Kangu, 2011).

Dissemination of government information through e-governance is very crucial because it is a voice on behalf of the silent majority, by keeping governments on check, by comparing what government promise to deliver and the actual levels of government delivery

Problem Statement

The Kenyan constitution established two levels of government that are distinct and interdependent which conduct their mutual relations on the basis of consultation and co-operation to promote; openness, transparency and accountability. Deployment of new ICT systems with specifications and solutions relevant to particular needs of every county without adequate attention to the need to connect, exchange and re-use data with national government systems, has seen the government incur huge losses in terms of finance, lost opportunities for enhanced effectiveness and time. This proliferation of independent e-government systems has largely remained uncoordinated with limited coherence. If e-

government initiatives were to be implemented with focus on addressing interoperability, up to 85% of government budget could be saved.

Objective

To develop e-government architecture that supports interoperability between national and county government of Kenya.

Developed county and national E-government architecture

The COK2010 establishes two levels of government; the county and national government, of distinctiveness, interdependence and intergovernmental relationships. The basis and framework for distinctiveness, interdependence and intergovernmental relationships are statutory and by best practice. The provisions of section 6(2) and 189 of COK2010 provide lead in this regard. Whereas section 6(2) lays emphasis on distinctive and interdependence, Section 189, demand close liaison, consultation and exchange of information, this is necessary for appropriate working of structures of governance.

The need for a framework to govern the intergovernmental relations is premised on the provisions of section 6(2), 187 and 189 of COK2010. The framework has been consolidated in the intergovernmental relations Act, 2012, whose principles and objective among others include; consultation and co-operation between the national and county governments, and among county governments, providing a forum for sharing and disclosing necessary data and information. This is conceptualized in figure 1.

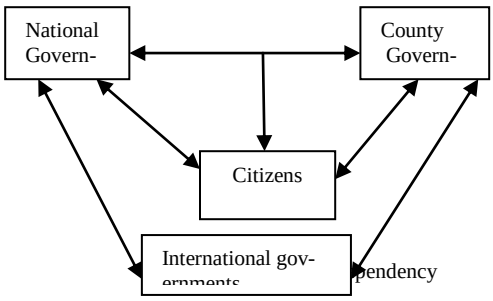

Figure 1: conceptual service interactions of County and

The Kenya e-government architecture was informed substantially by the following literature surveyed: MUL_NET conceptual framework (Wafula,2007), giving an insight of how government can achieve great success by letting ICT play the role of an enabler rather than facilitator in e-government. Architecture framework of e-government (Ebrahim and Irani, 2005), and the Federal Enterprise Architecture of U.S.A(ECLAC, 2007), an ideal government with two distinct but interdependent governments, which operate by cooperation and collaboration through consultation require its systems to be interoperable in nature so that there can be seamless flow of information that can be required for decision making.

According to (Kangu, 2011), the role of communication and information remains a critical component of generating information needed for decision making processes, analysis and interpretation of core issues of governance. To realize such intents, we developed a five layer e-government architecture as shown in fig: 2.6. This architecture builds a need-based and innovative action to thrive in the culture of interoperability, where both governments will be enabled to create, access, utilize and share information and knowledge they need for their own wealth creation and development.

The Kenyan E-government architecture took a structructed approach, which is rated the best according to (Flak et al,2009). This is because interoperability and architecture are intertwined in the execution of government services, thus care and attention must be given to each and every detail of the architecture, bearing in mind that e-government is about a set of organizations including; many autonomous agencies having various levels of readiness and different circumstances, governed by a democratic system and embedded in a certain institutional situation.

ICT provide greater accessibility, facilitate wider muilt communication and dissemination of information, enable better knowledge management and information sharing, increase government productivity once the processes have been transformed. In order to achieve this; the Kenyan E-government architecture aims at overcoming the observed limitations in e-governmet such as;

- Exchange of information and services being fragmented and complex, plagued by technical and organizational problems.
- The habit of reinforcing of old barries that make government decision making difficult rathe than transforming them through proper use of ICT as an enabler.
- Concentration to technical interoperability that is easy to achieve at the expense of organizational and semantic interoperability.
- Backend systems not being interoperable in nature due to legacy sytems and new systems that are sectored with specific solution, to only specific agencies

The county and national E-government Architecture Building principles

The Architecture was based on the following principles;

1. Establishment of good governance and organizational structures.
2. Interoperability being the state of the art for successful e-government.
3. Development of administrative environment that enables better and equal access to information and service, promote transparency and accountability.
4. Capacity building for enabling creation and Customization of services and applications due to increased diversity and choices of information, sources, products and services.

.

5. Consistent processes with clear collaboration to the other service consumers.
6. Capacity building of stable systems that are efficient and easy to maintain guided by use of standard technology.

The county and national e-government Architecture structure

The county and national e-government architecture marks a shift from the conventional hard-coding way of implementing business processes, which led to inflexible systems that were hard to modify and maintain, to a new four layered architecture for e-government as shown in figure 2**,** in which the process of transforming government processes is conceptualized in an integrated and structured approach.

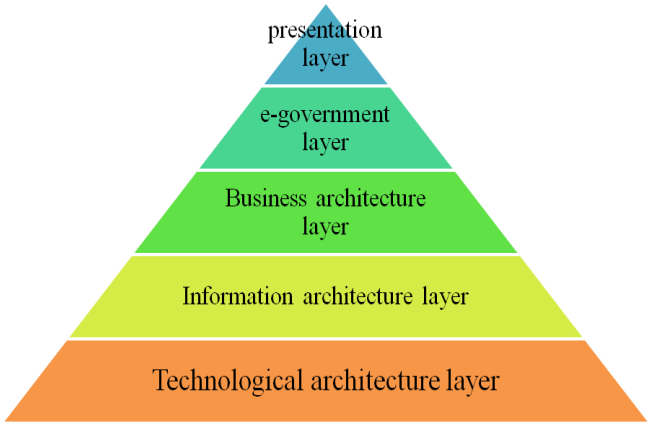

Figure 2. Basic representation of the Kenyan E-government Architecture

The pyramidal representation of the architecture figure 2, describes the structural relationship of the layers, where lower levels comprise the material of higher levels and it's integrated in nature. Typically, e-government is influenced by new and able ICT technologies that can act as an enabler in the re-engineering of government business processes and sustain an accountable and transparent government.

The kind of infrastructures or technology required is informed by the kind of government information available and how it is accessible to relevant agencies on time. Business process redesign depends on the information from the information architecture to depict a clear picture as-is and to be. Successful Business redesign will lead to an integrated e-government with fully interoperable systems, which can be accessed by users, stakeholders and organization in the government.

In simple terms one can conclude from the figure 2 that, e-government is influenced by technology, business architecture in terms of information architecture layer, e-government layer in terms of business architecture layer and finally presentation layer by e-government layer. According to the Kenyan E-government architecture, before reaching at the apex of the pyramid, the information must have been processed in such a way that the information has relevance for specific purpose or context and is therefore meaningful, valuable, useful and relevant, as shown in figure 3.

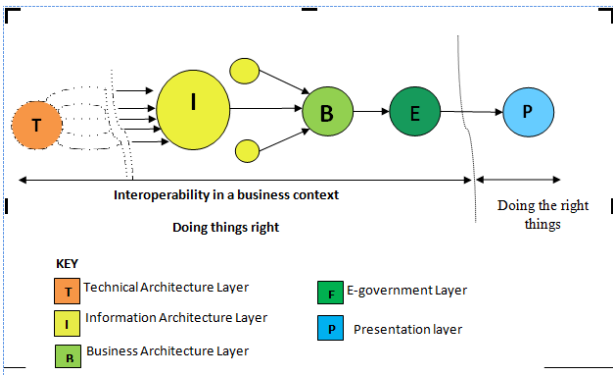

Figure 3. Functional representation of e-government architecture

The dotted link between the technology architecture layer and the information architecture layer shows the instability of e-government influenced by ICT capabilities and its availability (technical approach) rather than data that are the only stable elements. The solid links between the, information architecture layers, business architecture layer, E-government layer, and presentation layer shows the necessi-

ty of each and every action taking place if integration and interoperability is to be achieved in interoperable systems.

According to the figure 3; before service could be reached through channel and pervasive technology, the information foundation needs to first be consolidated for the purpose of building up a master data as a single source of truth that is established through, data identification, consolidation, cleansing and validation process that information can follow both a global-local structure and principles such as a single point data manipulation and channel communication elimination.

This means that the information architecture layer, business architecture layer and e-government layer shown figure 3**,** plays a very important role in the alignment of business processes to the appropriate technology, and defining the best means of access needed information. Figure 4, shows the overall structure of figure 2, describing its functions in detail at each and every layer.

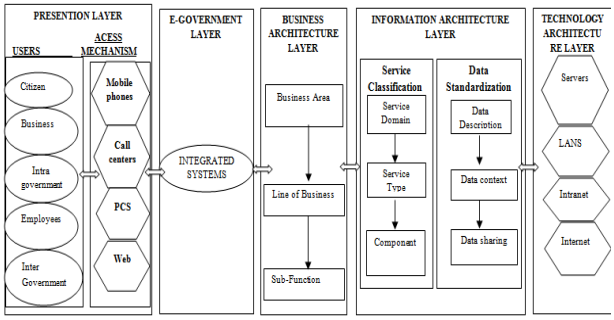

Figure 4. Overall E-government architecture structure With its functions

Presentation layer

The presentation layer identifies and describes the system users, who require access to government information at different capacities, and the channels through which information can be accessed. During system development, one is required to explicitly identify the government user, the system is intended to serve and also the means through which this information is to be accessed, so that the system can be tailored to meet these requirements.

It manages the user's interface with the system. If a project is to be successful, different stakeholders need to be identified in the beginning, involved in the initial stages, and kept involved throughout development and implementation.

E-government layer

E-government public services utilize very specialized applications those are only available to certain agencies and not all agencies participating in the consortium. The main goal of e-government layer is to achieve a government that;

- does not ask for information it already has
- Is focused on better services towards
- counties and national governments
- Will not allow its facilities to be misused
- Is well informed
- Is efficiently organized and in control of its internal affairs.

According to the Kenyan E-government architecture; with databases only in place semantic interoperability could not be realized due to the coherence between semantics within a more decentralized approach. This has been the greatest hindrance on the initial e-government initiatives; since public agencies develop their own systems independently from each other, and the granularity of how information is expressed differ greatly thus making seamless information flow a nightmare. Semantic interoperability should be at the core on all levels between databases and documents, processes and life events as can be seen in the subsequent layers. Therefore, e-government layer is the Culmination of the one source point of truth between the integrated national and county services.

Business architecture layer

The first-step toward a successful e-governance initiative is process re-engineering. This aims to simplify the existing processes and procedures, reduce the manual touch points and make the entire transaction cycle friendly. For E-governance to succeed, it is imperative that processes are simplified and understood by all stakeholders.

The business layer provides a functional rather than organizational view of the government's lines of business; including its internal operations and services for citizens, independent of the agencies, bureaus and offices performing them.

The business layer describes the devolved government around common business, thus promotes agency collaboration and serves as the underlying foundation for government process redesign and e-government strategies. Each business function is analyzed for potential for streamlining in order to facilitate optimization via collaboration and sharing.

The whole government agrees on which domains there are to uniquely identifiable and how they are going to identify

them. Both governments need to decide to which domain their process relates. Also, analysis of processes that might be affected or need to be integrated with legacy systems for efficient delivery of services, thus in this layer it not only touches organizational interoperability but also semantic and more insight to technical.

Information architecture layer

This layer can be divided into two;
Service classification sub-layer;
The service classification sub-layer classifies service components according to how they support business and performance objectives e.g ERPS,CRMs. It serves to identify and classify horizontal and vertical service components supporting government and their IT investments and assets.

It is organized across horizontal service areas independent of the business functions, providing a leverage able foundation for reuse of applications, application capabilities and business services.

Data standardization sub-layer;

The data standardization sub-layer is flexible and standard based to enable information sharing and reuse across the government via the standard description and discovery of common data and the promotion of uniform data management practices. It provides a standard means by which data may be described, categorized and shared. These are reflected within each of the three standardized areas;

Data descriptions;

Data descriptions, provides a means to uniformly describe data, thereby supporting its discovery and sharing.

Data context;

Data facilitates discovery of data through an approach to the categorization of data according to taxonomies.

Data sharing;

Data sharing, supports the access and exchange of data; where access consists of ad hoc requests (such as a query of data access asset) and exchange consists of fixed, recurring transactions between parties, enabled by capabilities provided by both the data context and data description standardization areas.

It provides guidance for implementing repeatable processes to enable data sharing in accordance with government-wide agreements encompassing national, county as well as other public and private non-governmental institutions. The intent is to mature, advance and sustains their data agreements in and iterative manner.

Technology architecture layer

The technology architecture layer categorizes the standards and technologies that support and enable the delivery of service components and capabilities. It also unifies existing agency technologies and e-government guidance by providing a foundation to advance the reuse and standardization of technology and service components from a government wide perspective.

Conclusion

In this Paper, an e-government architecture model for a devolved government is developed. It shows clearly how government can redesign their business processes based on the information and government policy to develop software. For a devolved government that operates through consultation and collaboration interoperability is of great value.

Acknowledgement

The author Mose S.M is thankful to supervisors; Pro Wafula J. M, and Dr. Kimani S. for their support to develop this document.

References

[1] Al-Busaidy, M. (2010). E-government diffusion in Oman: a public sector employees perspective. *Transforming Government: people, process and policy , 3,4*, 350-390.

[2] Al-Khouri, A. (2011). An innovative Approach for E-government Transformation. *Internation journal of managing value and supply chains , 2*(1), 20-30.

[3] Al-khouri, A. (2013). E-government in Arab countries, A 6-staged roadmap to develop the public sector. *Journal of management and starategy, 2013* .

[4] Allen, B. A., Julliet, L., Paquet, G., & Roy, J. (2011). E-governance and Government online in canada: partnerships, people and prospects. *centre of governance* .

[5] Bhattacharya, D., & Gulla, U. (2012). E-service Quality model for Indian government portals: citizens' perspective. *journal of enterprise management , 25* (3), 246-271.

[6] Cheng YI-WU, R. (2007). Enterprise integration in e-government. *Transforming Government; people, process and policy* , 88-89.

[7] Ebrahim, Z., & Irani, Z. (2005). E-government architectur and barriers. *Business management journal* , 589-611.

[8] ECLAC. (2007, April). E-government architecture, technical and political situation in latin America. *project document collections* .

[9] Flak, L. S., Dertz, W., Jansen, A., Krogstie, J., & Spjelkavik, I. (2009). What is the value of e-government and how can we actually realize it? *Transforming Government: people, process and policy , 3*, 220-6.

[10] Fong, E. (2007). *E-government interoperability.* Bangkok: UNDP.

[11] Gatra, A. S. (2011). E-government servive delivery and integration. *Information Technology for development* , 245-268.

[12 Geist, M. (2013). e-government failures. *threats to e-government initiatives and how to reduce failure risks* .

[13] Gouscos, D., Kalikakis, M., Legal, M., & Papadopoulou, S. (2007). A general model of perfomance and quality foe one-stop e-government service offerings. *Government information quarterly , 24*, 860-885.

[14] Gulla, U., Dash, S. S., & Gupta, M. (2011). A critical survey of selected government interoperability frameworks. *Transforming government people, process and policy , 5* (2), 114-142.

[15] Gupta, M. (2012). E-service quality model for indian government portals: citizens' perspective. *journal of enterprise information management , 25* (3), 246-271

[16] Haque, S., memon, R. A., & Shalkh, A. (2013). E-government using grid Technology:Developing a Grid framework for E-communication and collaboration system. *international journal of independent research and studies , 2* (1), 2226-4817.

[17] Hassan, H. S., Shehab, E., & Peppard, J. (2011). Recent advances in e-services in the public sector; state-of-the-art and future trends. *Business management journal , 17* (3), 526-545.

[18] Janssen, M., Charalabbis, Y., Kuk, G., & Cresswell, T. (2011). E-government Interoperability,Infrastructure and Architecture: State-. *Journal of Theoretical and Applied Electronic Commerce Research , 6*, 23-40.

[19] Kangu, M. (2011). *A report on the implementation of devolved government in kenya.* Nairobi: Government press.

[20] Kaylor, C. (2005). The next wave of e-government the challenges of data architecture. *Bulltein of the american society for information science and technology* , 18-22.

[21] Kumar, S. P., & Vijaykumar, N. (2011). E-governance projects, exploring the way to success. *SETlabs Briefing , 9*, 157-167.

[22] Naz, R. (2009). E-government for improved service delivery in Fiji. *Journal of service science and management , 2* (3), 190-203.

[23] Parrish, J. L. (2006). Power Issues in G2G e-government Applications. *proceedings of the 2006 southern Association for Information Systems Conference* , 170-175.

[24] peristeras, V., Loutas, N., Goudos, S. K., & Tarabanis, K. (2007). Semantic interoperability conflicts in pan-European public services. *proceedings of the 15th European Conference of Information Systems* , 2173-2184.

[25] research, D. (n.d.). At the dawn of e-government. *A global public sector study by deloitte consulting and Deloitte & Touch* .

[26] Sahraoui, S. (2007). E-inclusion as a further stage of e-government. *Transforming Government: people, process and policy , 1* (1), 44-58.

[27] Seifert, J. W. (2011). Federal Enterprise Architecture and E-government issues for information management. *CRS report for congress* .

[28] Sharma, S. K., & Gupta, J. (2003). Assessing e-government implementations. *Electronic government,an nternational Journal, 2004-inderscience* , 119-122.

[29] Signh, Gurmeet, Pathak, Raghuvar, D., & Naz, R. (2010). e-government for improved public sector service delivery in India, Ethiopia and Fiji. *International journal of public management , 23* (3), 254-275.

[30] Tripathi, R., Gupta, M. P., & Bhattacharya, J. (2011). Identifying factors of integrating for an interoperable government portal: study in indian context. *International Journal of Electonic Government Research , 7*, 64-88.

[31] UNPAN. (2012). Global e-government Survey. *United Nations Public Administration Network* .

[32] Wafula, J. M. (2007). ICT Policy strategies: Towards E-governance and sustainable development_the case study of EAST AFRICAN COMMUNITY AND KENYA. In J. M. Wafula, *ICT Policy strategies: Towards E-governance and sustainable development_the case study of EAST AFRICAN COMMUNITY AND KENYA* (pp. 90-125). Nairobi: JKUAT.