Evaluation of Integrated Financial Management Information System (IFMIS) in Tanzania

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Abstract

The purpose of this study is to evaluate the integrated financial management information system (IFMIS) in Tanzanian local authorities. In the 1990s, Sub-Saharan African governments and other developing countries embarked on plans to automate their business processes. Public financial management is one of the areas that were automated. The first author has been involved in the evaluation of IFMIS in the governments of Lesotho and Malawi. He has also provided IFMIS support to the Tanzanian local authorities and Namibia Tender Board. During these assignments, different data related to IFMIS success and challenges were collected. The methods used for the IFMIS audit and support were; desk review i.e. reviewing documents related to business processes analysis, functional requirements, user acceptance tests, government-vendor contracts, systems produced reports, project charter, and other documents related to IFMIS. We also conducted interviews with different users confirming their involvement and the use of IFMIS. Vendors were also interviewed to find out the approaches used in system design and implementation. System access was adopted to see the actual settings such as budget rules, user matrix, and chart of accounts, budget planning and management. IFMIS has been implemented for more than 16 years in Tanzania; however, some important objectives are yet to be realized. This study uses data collected in 2012 from Tanzanian local authorities; the first author worked with local authorities as an ICT consultant. The main challenges of IFMIS that were identified are related to interoperability, systems proliferation, running manual and automated systems in parallel, a lack of IFMIS policies, a lack of standards and principles. Among the main objectives of IFMIS are timely and accurate reports for n making decisions related to finance management. Furthermore, IFMIS reports are supposed to support the process of building transparency, accountability, and the reduction of corruption within governments. The current challenges facing IFMIS hinder the achievement of its core objectives. The study adopted System Development Life Cycle (SDLC) as a tool for evaluating the IFMIS used by Tanzanian local authorities.

Keywords: E-government; IFMIS; SDLC; Design; Integration; Proliferation

1. Introduction

Integrated Financial Management Information System (IFMIS) is one of the major components of e-government. IFMIS is defined as computer-based systems that automate and store key financial information in large organizations like governments (Laura 2009, USAID Report 2008, and Casals 2008). On the other hand, e-government is defined as the use of information communication technologies by the government to offer citizens and businesses the opportunity to interact and conduct business with the government by using different electronic media (Almarabeh and AbuAli 2010). A strong public financial management system is a catalyst for economic growth and development. It ensures that the government and its departments raise, manage, and spend public resources in an efficient and transparent way with the aim of improving service delivery (Ajayi and Omirin 2007). IFMIS is built through ERP solutions such as EPICOR, SAP, Free Balance, ORACLE, Serenic Navigator, etc. Since most ERP solutions do not have all modules required by public finance management, third party systems are acquired and integrated.

Good governance requires local authorities to demonstrate fiscal accountability and transparency in all revenue mobilization and expenditure decisions. This means, citizens should be able to hold governments accountable for the services they provide. This requires governments to provide information to the citizens about decisions they make and how public money is being spent. Therefore, IFMIS is supposed to produce information showing monthly revenue and expenditure. Governments use different communication media such as notice boards and websites to disseminate information to their citizens.

The automation of public finance management also involves procurement processes such as tenders to allow vendors to submit their bids online. The online communication between suppliers and the government makes IFMIS one of the components of e-government.

Sub-Saharan African countries embarked on implementing e-government systems, including IFMIS in 1990s. The literature shows one of the areas that were planned to be reformed from manual to e-services by governments was public finance (Stone 2013). Countries that were successful in the implementation of e-government usually adopted one of the MIS frameworks and had political willingness, and sufficient resources. The reviewed literatures and interviews conducted for this study indicate that the implementation of e-government in Tanzania was not supported by a defined framework or strategy. In contrast, countries such as Sri Lanka and Singapore are reported as being successful in e-government because they adopted e-government framework (James 2004 and Sin 2007). Another example of successful IFMIS implementation comes from Slovakia. It is very hard to emulate the rapid success of the Slovakia's IFMIS, the strong political will to implement IFMIS was a key driving force. It was also underpinned by a clearly defined strategy and timeframe (USAID Report 2008). Therefore, among the advantages of using an MIS framework such as an e-government framework are the ability to categorize, classify, and compare competing versions of electronic government, strategic agendas, and the potential results of initiatives. The framework acts as a lens to focus attention and awareness on the underlying issues and elements that should be debated, discussed, and further developed (Grant 2005). The literature and interviews conducted, and researcher observations made while implementing IFMIS in Tanzanian reveal e-government in Tanzania was introduced through reform programs such as public finance management reform, public health reform, water supply management reform, etc (Stone 2013). Frameworks such as SDLC are used in systems audit, therefore it is worth adopting them during the design and implementation of MIS.

Previous research shows e-government projects in countries such as Lesotho, Malawi, Namibia and Tanzania consume significant public funds. In addition governments around the world have made and continue to make massive financial and political commitments to establishing e-government (Grant 2005 and Accenture Report 2004). Regardless of these massive financial commitments, such projects still face high rates of failure from 60 percent to 80 percent. A survey conducted on 40 e-government projects in developing nations found that 35 percent of the projects were considered total failures, 50 percent were considered to be partial failures and only 15 percent of the projects could be classified as a success (Heeks 2003). This shows that failure in developing countries is higher than in developed countries. Furthermore, 80 percent of organizations say that ERP is vital to them, but 60 percent of those are not satisfied with what they have. There is a perception that ERP vendors keep talking about the latest technologies, whereas what their customers want are hard, bankable benefits as stated in the ERP implementation objectives (Martin 2014).

The literatures on this issue state that IT teams that adopt the SDLC method often increase their project success rates. SDLC provides careful examination of functional goals and detailed guidelines for system development and system implementation (Lai 2013). Other research papers argue that failures in e-government are caused by a lack of sufficient financing and political willingness (Heeks 2003).

2. Literature Review

2.1 IFMIS in the Government Domain

IFMIS has many advantages in the government domain including prompt and efficient access to reliable financial data, helping to strengthen a government's financial controls, improving the provision of government services, raising the budget process to higher levels of transparency and accountability, and expediting government operations (Peterson 2008). The scale and scope of IFMIS can vary from simple general ledger system to a comprehensive system addressing budget, revenue, expenditure control, debt, resource management, human resources, payroll, accounting, financial reporting, and auditing processes across central government or even including local government and other public sector and quasi-governmental agencies and operations (USAID Report 2008). USAID IFMIS report mentions the expected functionalities of IFMIS as shown below:-

- Provide timely, accurate, and consistent data for management and budget decision-making;

- Support government-wide as well as agency-level policy decisions;
- Integrate budget and budget execution data, allowing greater financial control and reducing opportunities for discretion in the use of public funds;
- Provide information for budget planning, analysis and government-wide reporting;
- Facilitate financial statement preparation; and
- Provide a complete audit trail to facilitate audits.

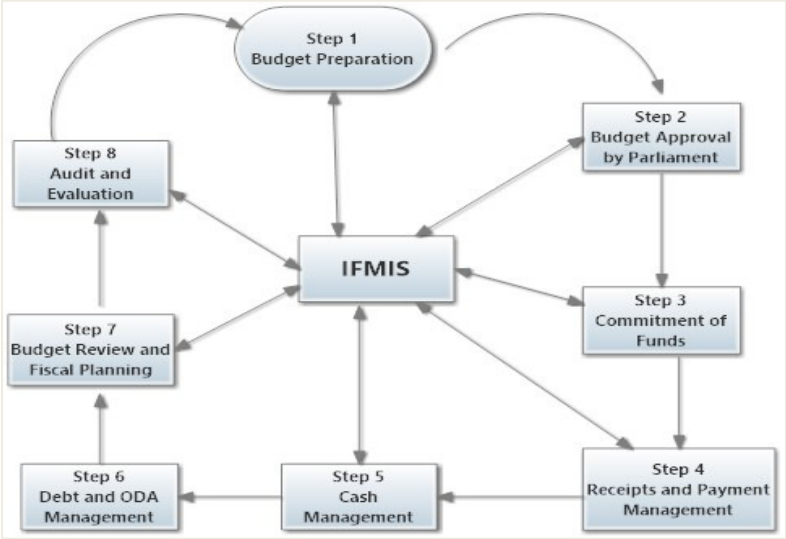

Figure 1: IFMIS and Public Financial Management Life Cycle Adopted from USAID Report 2008.

The figure above shows the way IFMIS is supposed to integrate. Based on the serious challenges faced in many governments such as resources and coordination, only a few projects are successful in the integration and production of aggregate reports (Heeks 2003).

2.2 System Development Life Cycle (SDLC)

SDLC can be used to design information systems, although it requires the objectives of the information system to be well defined. Adopting the SDLC helps designing a system which satisfies user requirements and performs the required tasks (Mohamed 1996). In order to do that building a computer – based information systems involves some basic tasks: problem detection; identification; and definition; solution definition (functional requirements); system analysis; logical and physical system design; procedures and program design; program writing; program testing; integrated testing; conversion and installation; and operation (Weitzel and Kerschberg 1989). To break that down, there are four main activities required for the development of an information system; a feasibility study or analysis, design, technical construction, and implementation. The designing involves the following activities:-

1. Studying information system requirements;
2. Analyzing functional requirements;
3. Describing functional specifications;
4. Deciding on the necessary changes for the new system; and
5. Assessing the technical support requirements of the new system (Franz 1985)

The adoption of SDCL guides the controlling of risks during the development of a new system in order to best promote success (Yu et al 2013). Aligning MIS development with SDCL minimizes queries from system's auditors (Snyder and Cox 1985). SDLC and other system development frameworks have their own challenges, nevertheless, they are still useful tools for system development. However, this paper will not discuss the limitations of frameworks like SDLC.

3. Methodologies

The data used in this paper was collected in 2012 from Tanzanian local governments. The assignment was conducted by a team of five people who collected data from the 21 regions of Tanzania's mainland. The Tanzanian regions were divided into five zones based on the number of data collectors as shown in Table 1 below.

Table. 1: Five of Zones of Tanzania Mainland and data collectors.

Location	Responsible Person	Position in the Ministry
Kagera, Kigoma, Tabora, Rukwa, Mbeya	Ebenezer Laizer	ICT Consultant
Tanga, Kilimanjaro, Arusha, Manyara	Archbold Kundasai	Ministry Statistics officer
Mwanza, Shinyanga, Musoma, Singida	Mtani Yangwe	Ministry System Analyst
Coastal , Dar, Mtwara, Lindi,	Emmanuel Mahinga	Head of ICT Department
Dodoma, Morogoro, Iringa, Ruvuma	Erick Kitali	Assistant Head of Department

The team adopted a purposive approach whereby the study sample was drawn from all Tanzanian mainland regional secretariats (RS). As mentioned above, the regional secretariats were divided into five zones based on the number of data collectors and each team member visited and collected data from one zone. From each RS, three local authorities (at least one from rural areas) were included in the sample. Therefore, the data collection covered all 21regions and 66 local authorities of Tanzania's mainland. During this study, Tanzania's mainland had a total of 160 local authorities. Therefore the sample covered 41 percent of all local authorities within Tanzanian mainland. The respondents were; top RS and Local Authorities management including regional administrative secretary (RAS); district executive director (DED)/municipal treasurer (MT)/council director (CD)); the head of human resource department; the head of planning department; the local government unit at RS; ICT personnel; the procurement management unit (PMU); internal audit unit, IFMIS users; users of human capital management information system (HCMIS); users of local government human resource information system (LGHRIS); users of PLANREP; users of local government monitoring database (LGMD). The top management and heads of departments were interviewed while other users filled in a questionnaire. The observation focused on the usability of the information systems available in the Tanzanian local authorities such as how many information systems, availability and status of computer networks, workstations, the distance between departments, the disposal of ICT devices, the condition of computer rooms, the availability and usability of power and data backup. The sampling technique that was adopted involved selecting certain units or cases based on a specific purpose rather than randomly sampling (Teddlie and Yu 2007). The data collection from the selected sites, systems users, and systems of the Tanzanian local authorities was conducted purposively.

4. Introduction of IFMIS in the Tanzania Government

The Tanzanian Ministry of Finance website says IFMIS was introduced in Tanzania through the Public Finance Reform Program Phase One (PFMRP I) of 1998. The website further informs that the Tanzanian IFMIS for central government and local authorities is built on EPICOR ERP which is a commercial off the shelf (COTS) and designed for business firms. Some of the governments in Africa such as Tanzania, Lesotho, Malawi, Gambia, and Nigeria use EPICOR. The structure of public and business firms finance management are different, therefore the ERP is normally customized to fit the public finance management structure.

Tanzania has been reported as one of successful countries in implementing IFMIS. The reported success of the Tanzanian IFMIS is based on political willingness, ICT readiness, sound project design, the phased approach of implementation, changes in the legal framework (to be IFMIS-compliant), project management capability, and adequate resources supply like money and human resource (Chêne 2009 and International Transparency IFMIS Report 2009). Regardless of the described success, some literatures demonstrate the challenges facing Tanzania's IFMIS. Both - the - central government -and - local authorities in - Tanzania have multiple - IT - systems - for planning, - accounting - and reporting - that are not able to interface with each other. This lack of an interface between IFMIS components weakens financial management and control.

It is reported that only 7 out of 12 modules had been implemented over the last decade and that there were ongoing fiduciary concerns about the manner in which the system was being used. Some concerns result because the inbuilt IFMIS controls have not been adequately activated, bank reconciliation weaknesses persist, poor interfaces between manual and automated systems exist, and because purchase requisitions and other processes were being raised manually instead of through the system (Tanzania Fiduciary System Assessment Report 2012). It is important to remember that one of the major IFMIS objectives is financial control.

The first design of IFMIS for Tanzania's local authorities was a standalone whereby each local authority had its own server computer and workstations within their local area network. This design complicated maintenance as users had to travel hundreds of kilometers with server computers to the vendor's office for maintenance. The vendor personnel also had to travel to the local authorities for updates and other maintenance services. - Both approaches were expensive in terms of money and time. In 2012 the government of Tanzania through a local government reform program decided to centralize local authorities IFMIS. The data center was built at the Ministry of Local Authorities (PMORALG). The centralization approach solved some old challenges, but has also created new challenges and some of the old challenges still persist. For instance, system updates are currently done from only one center, even the patches for client computers are pushed from one point. An example of persisting challenges is that; heads of departments are still left out of the automation and still use a manual system. This is one of the main reasons for the existence of automated and manual systems within Tanzania's local authorities. Another persisting challenge is the integration of IFMIS subsystems. The integration/interface of IFMIS subsystems is the key structural requirement which was not completed during the implementation and it is seriously hindering the achievement of the objectives set for IFMIS. The other persisting challenge is the processes that are not automated. Example for this come from procurement, i.e. requests for procurement, and the tender process, as well as writing of checks which is still done manually. An example of a newly created challenge is the lack of fiber optic connections to all local authorities forcing the adoption of four different network technologies to connect different local authorities. These are; fiber optic for 14 sites, very small aperture terminal (VSAT) for 14 sites, asymmetric digital subscriber line (ADSL) for 117 sites, broad band radio for 15 sites. This makes a total of 160 IFMIS sites for Tanzanian local authorities. Apart from the fiber optic sites, networks breakdown is frequent on other sites.

5. Findings

The findings discussed in this section are based on the interviews conducted, the responses to the questionnaires, system access, and the observations conducted at ministry, RS and local authorities level. This study will use SDLC to review the implementation of IFMIS within Tanzania's local authorities; the approach adopted by the Tanzanian local authorities is compared with those described in SDLC. This is presented at the end of this section.

5.1 Interoperability issues

Interoperability issues are one of the main challenges of IFMIS implementation within local authorities in Tanzania. This was identified during data collection. EPICOR ERP deals with budget management while PLANREP is tailor-made software that deals with budget planning and reporting. These two are not integrated and this has been the case for more than 18 years. The project documents and consultant reports describe integration of the two as a mandatory requirement, but this has not been done. This affects the production of the reports from local authorities IFMIS. The literature echoed the same problem for Tanzanian IFMIS (Masau and Cammack 2014). Based on the interviews this problem has been caused by many factors; project management failing to set a timeframe for vendors to integrate the systems, a lack of resources, the frequent update of these systems, major differences between actual expenditure and the budget, lack of commitment from all parties.

5.2 Systems Proliferation

During the data collection, the team found two systems for human resource management. One was human capital management information system (HCMIS), which was introduced by the Ministry of President Office, Public Service Management (POPSM).

The Second is the human resource information system (HRIS), which was introduced by PMORALG. HRIS was supported by Intrahealth and the University of Dar es Salaam. Users at Tanzania's local authorities are instructed by each relevant ministry to use the respective system. The data collection team found human resource officers at the local authorities had two computers for HR systems on their desks; one for HCMIS and another for HRIS. Each system can collect the data required by the other, but system owners were not willing to use the other system. As the HR system is supposed to integrate with IFMIS, system proliferation is a major source of confusion. The complication is due to the problem of human communication and integration rather than systems integration. A lack of coordination has resulted in the duplication of efforts, the misuse of resources and poor interoperability (Irura and Dimunzio 2015). The figure below shows how the current structure allows the duplication of information systems at the local authority level.

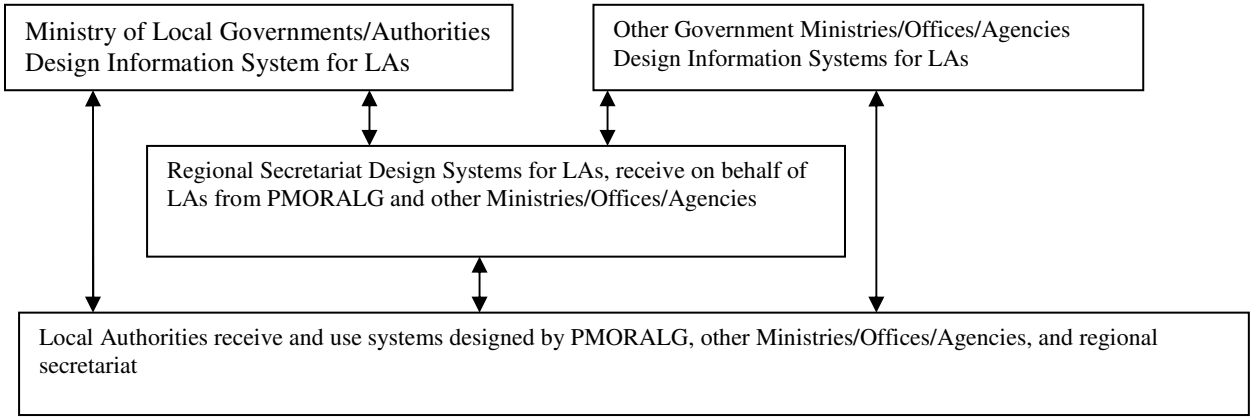

Figure 2: Current Structure of the Information System Design for Tanzania's Local Authorities

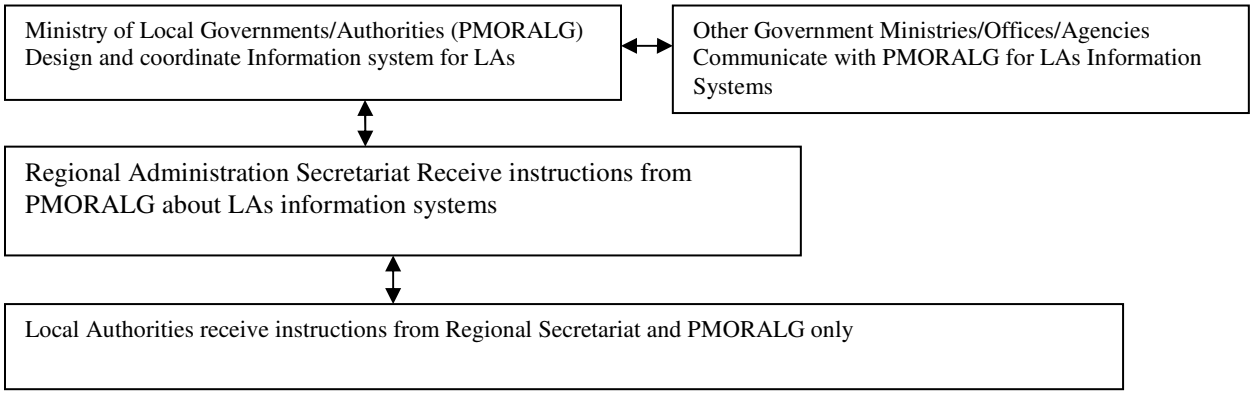

Figure 3: Proposed Structure of the Information System Tanzanian Local Authorities

The proposed structure for information system design allows the ministry responsible for the local authorities to review and re-design proposals from other ministries/offices/agencies made for those local authorities. This approach allows PMORALG to assess the existing systems against new requirements. The intention is to see whether the current systems can accommodate the new requirements through further customization.

5.3 IFMIS Support Structure in Tanzanian Local Authorities

The field visits in 2012 revealed that 53 percent of Tanzania's local authorities did not have IT personnel and many amongst the available 47 percent lack IFMIS skills. This is another major problem for the implementation of IFMIS by local authorities. On the other hand, there are many levels of support as shown by the following figure.

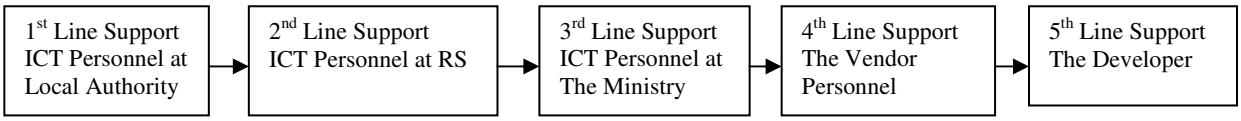

Figure 4: Levels of Support for the Tanzanian Local Authorities IFMIS

In case a local authority does not have IT personnel, the IFMIS support is obtained from RS IT personnel who support the RS and three to five local authorities. Some requests for solutions can go all the way to fifth level of support, which means more time is taken to obtain solutions. The low skills and competency from first to the fourth level of support are among the reasons for delayed solutions.

5.4 Decentralized to Centralized IFMIS

The first design of Tanzania's IFMIS in 1998 used decentralized approach as shown above. This design left out other heads of departements, procurement units, stores, internal audit, and fleet management. The Director of ICT at the Ministry of Local Authorities stated the challenges of decentralized IFMIS were high maintenance costs, systems variations based on the upgrade, a lack of data control, an inability to produce aggregate reports on time and from a single source. The government decided to centralize local authorities IFMIS in 2012 with one data center at the Ministry of Local Authorities. There are still persitent challenges such as the lack of standard disaster recovery sites, the lack of a redundant network, and the lack of a secondary data center. The design did not allow the sub-domains networks at regional and/or local authority level. The current design is prone disruption from network breakdowns, server breakdown, power outage, etc. The other major challenge of the centralized IFMIS by Tanzania's Local Authorities is the unknown costs of completing the project. In one of the meetings that attended by the first author, the principal secretary asked "How much is required to complete the setting of IFMIS of Local Authorities?" The relevant personnel from IT and finance departments were unable to answer this question.

5.5 Manual and Automated Systems Running in Parallel

Tanzania Local Authorities still use two systems in parallel i.e. manual and automated. This approach reduces the effectiveness of IFMIS. The figure below shows an example of financial processes that are completed through the adoption of both manual and automated systems.

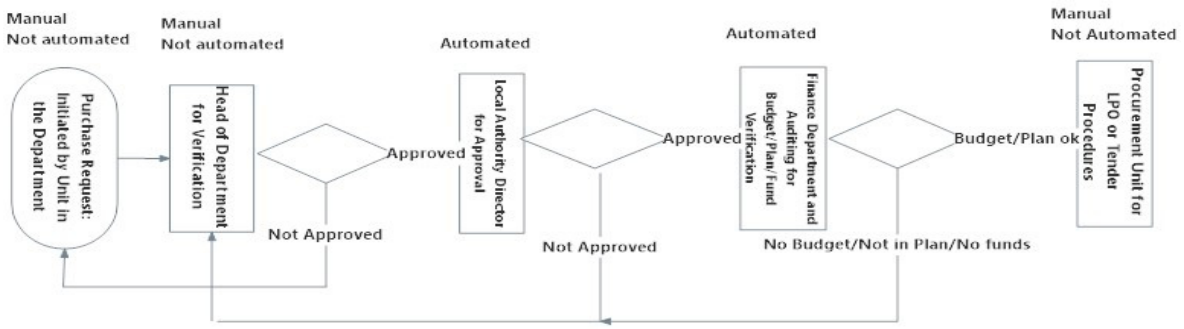

Figure 5: Initiating Payment in Tanzanian Local Authority: IFMIS approach.

5.6 Other Findings

Other findings from the IFMIS of Tanzania Local Authorities are a lack of risk register and mitigation measures; a lack of the important committees required for ensuring the successful implementation of IFMIS; a lack of project planning and management; a lack of recourses (financial and human); a lack of coordination between ministerial departments; RS; and local authorities e.g. IT and finance departments; a lack of IFMIS policies, standards, and principles; the lack of a pilot project; and the lack of contract management.

There is also a lack of alignment between IFMIS and the legal framework. For example, IT departments were created and IT personnel were employed at the Local Authority level, but the legal framework required them to be principal officers to qualify for appointment as heads of departments. As they were newly employed, they were not principal officers; hence they were not able to head the newly created IT departments in Tanzanian Local Authorities. Furthermore, it takes time to become a principal officer. This is one example of the existing challenges between IFMIS implementation and the existing legal framework. There is a need to update the legal framework to allow effective implementation of IFMIS. The table below shows the SDLC phases with the required activities measured against the actual activities performed during the design of the Tanzanian LA's IFMIS at each phase. The table also shows our remarks based on the actual activities performed during the implementation of IFMIS at the Tanzanian Local Authorities.

Table 3: SDLC showing modification, the current situation and recommendations

S/N	SDLC Phase	Required Activities	Current IFMIS Situation in Tanzanian Local Authorities	Remarks/Recommendations
1	Planning	1. Review possible alternatives 2. Feasibility Study 3. Cost/benefit analysis 4. Solution selection 5. Goal setting 6. Project initiation	1. Solution selection 2. Project initiation	The activities missed in this phase have contributed to the current IFMIS challenges faced by Tanzanian Local Authorities
2	Analysis	1. Process analysis 2. User analysis 3. Data analysis 4. Process redesign 5. Requirement definition 6. System interfaces	1. User analysis 2. Data analysis	The activities missed in this phase have contributed to the current IFMIS challenges faced by Tanzanian Local Authorities
3	Design	1. Inputs and outputs 2. Screen interface 3. Modules integration 4. Prototyping 5. Customization 6. Configuration	1. Inputs, outputs 2. Screen/interfaces 3. Customization (done by the vendor) 4. Configuration	Design is a very important phase in system development. The activities missed in this phase have contributed to the current IFMIS-challenges faced by Tanzania Local Authorities.
4	Implementation	1. Programming 2. Installation 3. Testing 4. Training 5. Change over 6. Troubleshooting	1. Installation 2. Training 3. Troubleshooting	The activities missed during this phase have contributed to the current IFMIS challenges faced by Tanzanian local authorities.
5	Maintenance/ Support	1. Support 2. Review	1. Support is provided 2. Its focus is on the payment module	The lack of risk register has complicated the current challenges in the maintenance plan for Tanzanian local authorities IFMIS

6 IFMIS in Developing and Developed Countries

The Implementation of IFMIS has been a challenge for both developing and developed countries. The rate of failure is higher in developing countries, up to 80 percent (Heeks 2003). The causes of the failures of IFMIS in developing countries, such as a lack of financial resources, are not always encountered by developed countries. The literature discussed the successful implementation of IFMIS in developed countries like Slovakia. The success of IFMIS implementation in developed countries is due to a combination of political willingness, sufficient resources, a clearly defined strategy and time frame, amongst other things. The coordination of IFMIS project has been a major challenge in developing countries while in developed countries it has generally been well managed (USAID Report 2008).

The experience shows that IFMIS in developed countries is normally implemented as an internal requirement while in developing countries it has been driven by external forces such as a donor community. There has been a lack of IFMIS project ownership in many developing countries, which has been a key factor in the failure of IFMIS implementation (Diamond and Khemani 2006).

7 Conclusion

IFMIS is the automation of public finance management (PFM) processes. As governments are the biggest organizations in the countries, a state's adoption of IFMIS requires serious commitment during all phases of a project framework i.e. planning, analysis, design, implementation, and maintenance. Some governments have been reported to as being successful in using an e-government framework in the automation of government processes. Some countries, such as Tanzania, have adopted IFMIS through a public finance management reform program (PFMRP). Other information systems in Tanzania have been adopted through other reforms programs like health reform programs. However, the lack of integration and coordination; slow networks and network breakdowns, a lack of competent support, using automated and manual systems in parallel, and systems proliferation create many challenges facing implementation of IFMIS by Tanzania's Local Authorities and other developing countries. The study recommends adopting proposed structure through an e-government agency. Doing that will ensure the coordination and maximum utilization of the information systems implemented within Tanzania's Local Authorities. The adoption of information systems frameworks in the implementation of management information system such as IFMIS will reduce the bottlenecks discussed in this and other papers. Apart from SDLC there are other frameworks which guide the relationship between the developer and vendors, management, and users (see Hirchheim and Kelin 1989). There is also a framework for the alignment of organizational and IT infrastructure (see Henderson and Venkatraman 1993). The adoption of more frameworks in design of IS such as IFMIS will minimize the weaknesses of a single framework. The effective design, implementation, and maintenance of an integrated financial management information system (IFMIS) can be effectively achieved through the adoption of one or more frameworks such as e-government, SDLC, etc. The adoption of one or more frameworks will help governments achieve the intended objectives of IFMIS; transparency, accountability, good services for citizens, less corruption.

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