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Factors Affecting the Sustainability of Information Technology Projects in Public Organizations: The Case of the Ethiopian Revenues and Customs Authority

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Abstract

The project environment in the 21st century is characterized by a high level of uncertainties mainly as a result of faster technological changes, involvement of various stakeholders with their diverse and ever-changing needs and requirements, and required an outlay of huge amounts of money. Therefore, in the dynamic environment, satisfying the needs and requirements of project stakeholders sustainably is challenging. The study aims to investigate the factors that affect the sustainability of information technology (IT) projects in the Ethiopian Revenue and Customs Authority (ERCA). In order to meet the objectives of the study, a descriptive research design and mixed research approach were employed. The result of the study has shown that the alignment of the introduced systems with the vision and mission of the Authority, the establishment of a department that can provide technical support for users and others are the identified factors that positively influence the sustainability of IT projects in ERCA. Some of the factors that negatively affect the sustainability of the products of IT projects include the absence of organizational policy and guidelines which can govern the utilization of IT, incompatibility of the existing technologies with some of the national proclamations and so forth. However, it is difficult to say as IT projects introduced to administer tax in ERCA are sustainable to some extent rather they are "challenged projects." Therefore, to address the identified gaps, designating organizational policy and guidelines to govern the products of the IT projects scientifically is critically needed by ERCA. Also, the Authority should work with the concerned federal stakeholders to create alignment between the national frameworks and the introduced IT systems.

Keywords: project, project management, sustainability, e-government, information technology

1. Introduction

Public organizations expend their scarce resources on information technology (IT) mainly to enhance the socio-economic benefit of citizens (Carbrea, 2015). Providing efficient and effective services by government or public organizations electronically with the help of ICT is known as e-government (Ziemba, Papaj, and Jadamus-Hacura, 2015). In e-government, the sustainability of the products of IT projects in government organizations refers to the continuous

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utilization of the e-government systems without abandoning them and returning to paper or manual work mainly after projects are official closed or handed over (Nurdin, Stockdale and Scheepers, 2012).

But the sustainability of projects can be affected by different internal (project level) and external (institutional and contextual) factors. The research is, therefore; focus on the factors affecting the sustainability of IT projects in the Ethiopian Customs and Revenues Authority (ERCA).

In many pieces of literature, one of the reasons why many IT and non-IT products of projects are underutilized, abandoned, or closed mainly after their official closure or handed-over is due to insufficient attention given to the dimensions of sustainability from the outset of the project endeavors (Schwalbe, 2014).

In Ethiopia, the success rate of IT and non-IT projects are so low just like the other developed and developing countries. For instance, ICT projects such as WoredaNet and SchoolNet that have been undertaken by the Ethiopian government in the last decade cost about $ 100 Million. Conversely, most of these initiatives are unsuccessful. One of the identified reasons for their failure is insufficient attention given to the issues of sustainability starting from the beginning when projects are conceived (Lemma, Solomon and Mesfin, 2012). Getaw (2017:1) has further noted that "the concept of [project] post-completion sustainability is not yet recognized as a crucial and part of the project process in the developing countries like Ethiopia. Sustainability is still seen as a "nice-to-have" addition to the normal practice…"

As far as the assessed literature is concerned, the factors that affect the sustainability of projects in general and IT projects sustainability, in particular, are insufficiently addressed in various studies. Therefore, understanding the experiences of ERCA in this regard is the rationale behind the researchers' to deal with this theme mainly to fill in the existed knowledge gaps.

The overall objective of the study is to examine the factors affecting the sustainability of information technology projects in the public organization of Ethiopia with particular emphasis on the Ethiopian Revenues and Customs Authority. The specific objectives of the study include a) to investigate the extent to which the benefits of information technology projects in the Ethiopian Revenue and Customs Authority continue to provide their benefits after they have been routinized; and b) to find out the major factors that affect the sustainability of information technology projects after their official closure in the Ethiopian Revenue and Customs Authority.

2. Review of Related Literature

2.1 Information Technology Projects and their importance in Public Organizations

According to Project Management Institute (PMI) (2008:5), "A project is a temporary endeavor undertaken to create a unique product, service or result." It is not an end in itself rather it is the means to achieve strategic goals and objectives of organizations which are usefully parts and parcels of strategic plans (Ibid). IT projects are focusing on creating products, services, or results mainly by employing hardware, software, and networks (Schwalbe, 2014).

The services provided by government organizations with the help of ICT are known as e-government, electronic government, or digital government. E-government not only facilitates the interaction of governments with citizens but also eases communication among employees of an organization (Ganapathy and Kumar, 2014). E-taxation is one example of e-government (Ibid).

Especially, for countries where in-land revenue is one of the major sources of funding for the provision of social services for citizens, modernizing the administration of tax mainly through employing ICT is critically needed. To this end, many countries around the globe have been using one of the IT application systems, that is, Standard Integrated Government Tax Administration System (SIGTAS) in administrating the issues of tax. The same author has pointed out that SIGTAS can administer all the core taxes such as case management, audit, appeals as well as interest and penalty.

Automating tax administration has the following advantages. Some of them include achieving uniformity in applying tax laws, providing quality services to internal and external customers and taxpayers' education, improving targeted audit programs and so forth (Ganapathy and Kumar, 2014). According to Kariuki (2013:1-2), the advantages of using ICT in revenue administrations constitute improving client service and promoting voluntary compliance and hence increasing revenue collections-largely by making it more user-friendly and convenient to file tax returns and pay any amounts due. Besides, ICT systems have a role to play to minimize rent-seeking behaviors of the actors in the sector mainly by decreasing the level of in-person interaction between taxpayers and revenue administration staff. ICT in tax administration also facilitates the decision-making processes of individuals who are involved in tax administration issues.

2.2 Factors Affecting Project Sustainability

Sustainability in the realm of project management is defined as the continuous provision of benefits of the results of a project (product or service) for its estimated or desired time mainly after a project is officially closed or handover regardless of the types of projects undertaken (Theuri, 2014). IT sustainability in government organizations refers to "the retaining and using of e-government systems with no intention by government organizations and its people to abandon it and return to the manual system." (Nurdin, Stockdale and Scheepers, 2012:283)

Sustainability is one of the factors that determine project success (Soliman-Sabbil, & Mastour-Adam, 2015). Temtim, Solomon, and Amoroso (2009) have noted that ICT project success is not only measured from cost, time and scope parameters but also includes the extent to which products are assimilated or integrated with the different functional units of organizations mainly to make their service effective and efficient.

Countries of the world have been spending their huge amount of resources on IT projects by taking it as one means of their competitive advantage and/or to provide efficient and effective services for their respective citizens/clients. Especially public organizations expend large amounts of money on IT projects mainly to enhance the socio-economic benefits to be provided to citizens (Carbrera, 2015). Nwakanma et al. (2013) also described the high expense of IT projects in quantitative terms as "capital intensive."

However, Oino et al (2015: 759) have explained as there is a difficulty of project sustainability in developing countries by stating "Project sustainability is a major challenge… in many developing countries. Most projects implemented at huge amounts often tend to experience difficulties with sustainability."

According to Ahemed-Nawi et al (2013:247), among the ICT Hubs introduced in Malaysia, for instance, only 19 percent have found sustained after 10 years of the undertaking of the projects. In other words, 81 percent of them "failed to sustain, either because it were underutilized, abandoned or closed." In addition, out of seven projects which are undertaken in South Africa, Tanzania and Zambia, only two (30 percent) were sustained (Theuri, 2014).

In the last decade, the Ethiopian government has commenced ICT projects such as WoredaNet and SchoolNet that cost about $ 100 Million. But most of these initiatives are unsuccessful. One of the identified reasons for their failure is insufficient attention given to the issues of sustainability from the beginning when projects are conceived (Lemma, Solomon and Mesfin, 2012). Getaw (2017:1) has further noted that "the concept of post-completion sustainability is not yet recognized as a crucial and part of the project process in the developing countries like Ethiopia." The same author has argued that making sustainability components of a project part and parcel of its process groups are the missing elements in most project endeavors instead it is considered as a "nice-to-have" idea.

There are internal and external factors that contribute positively and negatively to the sustainability of projects (Carboni, 2014; Salla, 2014). Winstead (2012) has revealed that the former is linked with the process in which projects are managed whereas the latter is associated with the context of the host organizations in which the projects are undertaken and the external socio-economic, political and legal environments that are beyond the are external and beyond the control of organizations.

2.2.1 Internal Factors

According to Steinfort and Walker (2007), one of the most important internal factors that affect project sustainability is the project level which includes how projects are managed before their official closure. This is because the outcomes of the projects are determined by the way in which they are managed during the whole project management process including initiating, planning, executing, monitoring and controlling as well as closing (Salla, 2014; Schwalbe, 2014).

The initiating process group is the initial stage to approve "a new project or a new phase of an existing project" to be commenced and to exert human and non-human resources (PMI, 2008:45). According to Pinto and Slevin (1987) activities which are expected to be undertaken at the initiation stage like the identification of preliminary project scope and objectives and their alignments with the business objective, the stakeholders who are expected to be involved in the endeavor in different aspects, the assessment of the appropriateness of the technology which are intended to be put in place and others have a significant impact on project sustainability.

The planning process group involves further detailing of the project scope, objectives, requirements, stakeholders, risks, budget and activity durations that were primarily specified in the initiating process group in a way that they can be practically implemented (Jarocki, 2014). Kasule (1996) has also identified three major activities that can be undertaken in the planning process group which include detailed scheduling, budgeting, and the allocation of other specific tasks and resources. Studies have shown that improper estimation of schedule and cost, lack of clear understanding about the objectives of a project, insufficient consideration of stakeholders' requirements and others are some of the reasons accounted for project failure (Zuofa and Ochieng, 2014; Kerzner, 2009).

The actual products or results of a project are expected to be delivered during the executing project management process group (Harrow and Oblinger, 2015). The level of stakeholders' engagement and communication, the standards of the activities that are undertaken in comparison with what has been planned; the quality and quantity of the procured materials, methods of assuring quality and others are the concerns of sustainability in the executive process group (PMI, 2012).

Monitoring and controlling process group involves "those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to

the plan are required; and initiate the corresponding changes" (PMI, 2008:39). In this stage, there are two aspects in which project sustainability can be taken into account. Identifying the standards to compare the identified targets against the progress made and the method in which the progress to measure made based on the identified standards are its aspects.

The closing process group involves officially declaring as the project has been completed all of its predetermined activities (Harrow and Oblinger, 2015; PMI, 2008). Formalizing and approving the completion of the project by all stakeholders, and transferring the ownership of the project deliverables from the project team to beneficiaries or clients are some of the activities of the closing process group (Ibid; Pinto and Slevin, 1987). The sustainability dimension of the closing stage of a project involves the way in which the stakeholders of the host organization accept the product of the project.

In general, sustainability, in the context of project management, is not a standalone activity that can be employed only once in a project's lifetime rather it is an ongoing activity throughout all project management process groups starting from initiation to project closure.

2.2.2 External Factors

As discussed before, the external factors of project sustainability as the name indicates is beyond the project level factor. It is concerned about the internal situations of the host organization/institution that the project's result (output) is introduced for as well as the contexts of a country in which the organization is found and the world, in general, to adapt and/or adopt the output of the project (Soliman-Sabbil & Mastour-Adam, 2015). Salla (2014) has subdivided the factors into two major categories: institutional and contextual and each of which has several dimensions.

Institutionally, several factors contribute project sustainability. The linkages between institutions' or organizations' mission, objectives, and strategies with the introduced products' of projects belong to institutional factors. Also, the departmentalization or the structure of organizations and their respective and overall internal working systems, the organizational culture (the way in which the end users or beneficiaries of products are accepted and make use of the introduced system), the resources deployed for maintenance of the product, the knowledge and skill of users, and stakeholders' involvement and support are some of the parts of institutional factors that affect project sustainability (Soliman-Sabbil, & Mastour-Adam, 2015).

According to International Fund for Agricultural Development [IFAD] (2009), institutional factors are more concerned with the integration or "institutionalization" of the output of the project into its routine activities mainly supporting the product through organizational policies, practices, or processes.

The success of information system projects is also relying on whether the users have accepted the technology or not. According to Davis (1993:1), "Lack of user acceptance has long been an impediment to the success of information systems." The argument of the author underpins that it is not only the users' skill and knowledge that hinder the sustainability of the system but also their attitude has its own contributions.

The socio-economic, political, and other situations of a country and the world are the contextual external factors that influence post-project completion sustainability (Salla, 2014). Politically, when government policies and regulations are changed now and then project sustainability can be affected negatively (Hutaserani & Bayley, 2010). The will and commitment of political leadership in creating enabling policy and legal framework, commit resources and others are among the contributors to project sustainability from a political context (Ibid). The

diversity of society in terms of gender, educational background, living standard, accessibility to technologies, and others are among the social factors that determine project sustainability (Salla, 2014).

2.3 The National Frameworks to Execute IT Projects in ERCA

To obtain what is intended from IT, following a certain national principle that can govern especially the why and what parts of the projects in the technological sphere are critical. Thus, some of the national frameworks are the 1990s civil service reform program (CSRP) and its sub-components aimed at providing effective and efficient service to customers (Nigussa, 2013) and tax reform that was introduced between 1999 and 2003 under the umbrella of the CSRP with its objective to increase the revenue of the country mainly by employing ICT, creating institutional arrangements and others (Samuel, 2015). The two proclamations such as Income Tax No. 286/2002 (amended in 2016 and VAT No.285/2002 (Ibid), the First and the Second Growth and Transformational Plan (GTP I and II) of Ethiopia emphasize the application of information systems in the management of domestic tax (National Plan Commission [NPC], 2016) and others are enabling environments that have been created at a federal level pertinent to IT issues.

3 Research Methods

To address the stated research questions of the study, a descriptive research design was employed. The study has used both qualitative and quantitative (mixed) research approaches. The questionnaire was adapted from the Technology Acceptance Model (TAM) developed by Fred D. Davis (1989) and filled by the employees of ERCA, who are SIGTAS users. It is because, in dealing with project sustainability, understanding the reaction of the end users about the already implemented system is critical. The target population of the study was employees of ERCA who use SIGTAS and e-tax systems in its three branches including Large Taxpayers Office (LTO), Misrak Addis Ababa medium Taxpayers and Addis Ketema Small Taxpayers. Besides, employees at different management positions and IT experts were part of the population of the study.

Regarding the sampling procedure, the researcher has taken the Large Taxpayers Office (LTO) as a sample through the purposive sampling technique because of its unique nature in dealing with e-tax in addition to SIGTAS. From the two branches; Misrak and Addis Ketema branches are selected through a lottery method from the two Medium Taxpayers and ten Small Taxpayers sub-city branches, respectively, by assuming that their respective structures and function are homogeneous.

Among the 438 users of SIGTAS in the three branches, a total of 115(26.3 % of the population) questionnaires were distributed to the respondents (ERCA's employees) and 96 (83.5 %) were properly filled in and returned. Inside each category of ERCA, samples of SIGTAS users were taken from each department, that is, customer service, assessment and collection, and tax audit proportionally by employing a stratified sampling technique.

4 Data Presentation and Analysis

4.1 An Overview of the Sustainability of IT Projects in ERCA

Tax reform has been undertaken in Ethiopia between 1999 and 2003 as part of the civil service reform programs. Enhancing or modernizing the tax administration system of the Authority is one of the parts of the tax reform and which can be possible Ali et al. (2015) through deploying IT developing IT "normally done via projects" (Blume and Bott, 2015). Accordingly, the

Ethiopian tax Authority has carried out two major projects such as the Standard Integrated Government Tax Administration System (SIGTAS) and E-tax. SIGTAS project has three phases. The first phase has been undertaken by the then Federal Inland Revenue Authority currently known as ERCA (Samuel, 2015). In 2003, SIGTAS has become functional mainly to manage Value Added Tax (VAT) following the issuance of VAT Proclamation in 2002 since it is difficult to calculate VAT manually (Teklu, 2011).

Between 2005 and 2006 the second phase of the project was carried out and which focused on the automation and inclusion of all other taxes such as excise, income, turnover, withholding and with SIGTAS (Samuel, 2015). The third phase (2008 – 2009) was focusing on the deployment of SIGTAS in different Regional State tax Authorities of Ethiopia and the customization of the E-tax platform (CRC Sogema inc., n.d.).

Besides, ERCA customized the E-tax system in 2012 in collaboration with CRC Sogma consulting firm with an investment of about $1.9 million (Inner City Fund [ICF), 2013). According to Samuel (2015), the intended objective of the E-tax project was to provide services for large and medium taxpayers 24 hours a day and 7 days a week through the web. The specific services that the E-tax system is expected to provide include online tax registration (e-registration), monthly and annual tax declaration (e-filing), payment through bank interface, provide online support services to the taxpayers, provision of training and education, and others.

The very intention of automating the tax administration system is to enhance the efficiency and effectiveness of back and front office services of the tax administrator in so doing increasing the revenue generation capacity of the country.

The researcher has asked the informants to explain whether they are getting the expected benefits from the introduced systems (SIGTAS and E-tax) or not in terms of reducing manual work in their respective service provision activities. To begin with, in the case of SIGTAS, almost all interviewees have described as it can integrate all tax types of a taxpayer if he/she has different sister companies (businesses) in one file through their taxpayer identification number (TIN). Therefore, checking the types of tax that the taxpayers are liable to pay, and the type of tax that they are already paid and failed to pay by a simple click of a computer. In this regard, users of SIGTAS have stressed the advantages that they have got as a result of using the system mainly to reduce manual work thereby to save their time and energy. Besides, since the system is integrated throughout the country, there is no need of registering a taxpayer if he/she is registered once in one of the Authority's branches on the system wherever it is found in the country.

Many interviewees have attested that SIGTAS can automatically calculate the number of days that taxpayers are expected to be penalized due to their late payment of tax. Also, the system updates the calculation of the monthly interest of taxpayers of the country automatically. Hence, it is possible to understand that employing SIGTAS in the day-to-day activities not only contributed to increase the efficiency and effectiveness of individual employees but also the Authority too as compared to manual work. In so doing, the Authority has reduced its administrative cost. From the management perspective, SIGTAS can generate progress or status reports on different aspects of tax for decision-makers. Thus, it is possible to deduce that SIGTAS has contributed to the Authority in facilitating the decision-making processes of employees and managers at different levels although it has several challenges as discussed below.

As informants described, E-tax has reduced unnecessary delays of the cases of taxpayers to come now and then to the Authority and to check their respective files from hard copies. It also benefits them from waiting in a large queue to get services from the Authority. A directorate

director in ERCA has revealed the advantages that E-filing brings for taxpayers as "after the introduction of e-filing, the large taxpayers could declare their taxes by encoding and checking their respective data whenever and wherever they are monthly through their TIN."

As discussed before, the overall objective of the deployment of SIGTAS and E-tax in ERCA is to increase the amount of revenue collection capacity of the country through automating all domestic taxes and all branches nationally and creating accessible services for taxpayers. In this regard, ERCA (2014) has indicated that the amount of revenue collected from taxpayers has increased from 11.2 billion birr in 2006 to 35.6 billion birr in 2010 as a result of automation. A middle-level manager in ERCA has also strengthened the report of ERCA by saying "thanks to the introduction of SIGTAS and E-tax, the tax collection capacity of the Authority is strengthening from time to time contrary to the management of tax in manual ways."

On the other side, there are informants who do not believe as each of the products of IT projects is sustainable to some extent by citing examples. In SIGTAS, according to informants, there are modules (units of software under the umbrella of SIGTAS) that are not practically working. For instance, revenue sharing and assessment notice sub-modules are not functional. In the revenue sharing module, according to Article 51(10) and 52(e) of the FDRE constitution, the Federal Government and Regional states, respectively have the power to generate revenue from their respective tax. However, there is a difficulty in dividing the revenue that is generated by the respective Federal and Regional States' through the system. The assessment notice sub-module (notifying of the details of the amount of income tax that the taxpayers are expected to pay including the amount of their tax refund, tax credit and income tax already paid by the Authority) of the system is also impractical. In addition, the bank tracking sub-module in cashing the main module is not working as a result of the absence of networking (interface) between the Authority and the banks.

Article 11(1) of the FDRE (2011) Private Organization Employees' Pension Proclamation has declared that private organizations of Ethiopia should deduct contributions of their permanent employees from their salaries and their own contributions, 7 and 11 percent, respectively and pay the amount monthly to the Authority. To collect this fund, according to informants, all employees of private organizations do not have TIN. Therefore, employers are required to bring the lists of their employees in hard copies and the collection process is done according to the hard copy presented by the employers.

In addition, the Authority is responsible to give clearance to the taxpayers who cease their business or renew their license. In giving clearance, the system cannot consider the inactive period in that the taxpayers did not run their business. SIGTAS cannot show the date and month when the taxpayers exactly start his/her business. After TIN registration, the taxpayers are expected to pay their taxes. But in certain circumstances, the taxpayers might not start work as soon as they have got TIN. Therefore, it is difficult to issue clearance via SIGTAS. There are also times when SIGTAS considers the punishment of the taxpayers due to the late payment of their tax liabilities as tax payment and vice versa. When the system gets down due to electric power disruption or network disconnection unknown errors occur that are expressed in terms of like making the amount of payment over or under at these situations manual work is the only solution.

Since 2015, E-tax is at a pilot level which is providing service only for large taxpayers who comprise 3 percent of the total number of taxpayers in the country even though it was planned to be used for medium taxpayers too (Dawit, 2015).

In E-tax, as the informants pointed out, its online payment system is not functional. The idea of the above informants is concurrent with what Dawit (2015) has explained. Accordingly: "Under the E-file, although taxpayers file online, their payments can only be done in person at ERCA's offices'…" though the Authority has notified as the service will be commenced in 2015. To conclude, it is possible to understand as there is a disparity between what was intended and obtained in the aforementioned IT systems in ERCA. Because of the sated pitfalls, it is difficult to say as IT projects introduced to administer tax in ERCA are sustainable to some extent. Although the aforementioned projects are handed over and have become functional after passing through the project processes, it is possible to conclude that they are "challenged projects". Challenged projects according to Putnam (2007) mean failed to constitute "all functions and features" that the projects are initially intended to provide for users.

4.2 Factors Affecting the Sustainability of IT Project in ERCA

4.2.1 Internal Factors

It is mentioned in the literature review part of the study that the extent of the engagement of project stakeholders' especially internal and external users and functional unit managers at different levels and others in all project management process groups from initiation to determine project sustainability. In this regard, according to the assessment and collection business process team leader in Misrak Medium Taxpayers, "the initiation of SIGTAS and e-tax projects in ERCA are top-down." But Martino et al (2011) have attested that both the top-bottom and bottom-up approaches should be taken into account in the identification of requirements of ICT solutions to get what is intended from the projects sustainably.

Especially, SIGTAS was initiated and deployed primarily to administer VAT following its declaration and Income Tax Proclamation in 2002. Therefore, almost all interviewees have explained as exhaustive internal and external users' needs were not considered. SIGTAS project from its outset was developed mainly based on the interest of the tax collector (the Authority), not taxpayers. Even from the tax collectors' side, the needs and requirements of employees were not thoroughly assessed.

The other project-level factor that negatively affects the sustainability of SIGTAS project is the inability of conducting a detailed feasibility study. The system developer, CRC Sogma has explained as a feasibility study was conducted when the systems were put in place. A manager in the Information Technology Management Directorate (ITMD) in ERCA agrees as a feasibility assessment was done although it is not rigorous in accommodating the needs and requirements of the internal and external users in particular and the context of the country in general. The system developer has used IT experts in the Authority to conduct the feasibility study. But the skill and knowledge of the experts are limited in identifying the requirements of the management aspects of the business. The experts can understand the technicalities of the project from an IT perspective. From the internal users' perspective, the difficulty of identifying their requirements properly or failing to express their challenges on the other side contributed to the shortcoming of the feasibility study. That is why SIGTAS is not fully functional.

The feasibility study is deemed to be an input to determine the capacity of the intended system in terms of how long it can serve, the kinds of functions that it should constitute, for how many people, and others. But interviewees from Misrak Medium Taxpayers Branch have mentioned as when SIGTAS was introduced the number of taxpayers was small. Now, the number of taxpayers is increasing from time to time and the system could not accommodate the

ever-increasing number of taxpayers that is why SIGTAS is getting busy and so slow in its functioning these days.

System busyness resulted from the insufficient attention given to the feasibility study and the inability of forecasting the capacity of the system for the intended period and with the number of taxpayers. Informants have also identified that the problems of electric power fluctuation resulted from a lack of detailed feasibility studies to sustain the system at the organizational level. This is because in principle a feasibility study should include the internal and external situations of an organization including the electric power supply.

Informants in LTO have contended that when E-filing has introduced the readiness of the taxpayers to use the technology concerning their employees' basic computer skills to use the system, internet connection, level of their trust to use the technology and others could not take into consideration. Because of this, many taxpayers are coming to the branch looking for the assistance of IT staff in the E-filing process with their hard copies.

Hence, from the above viewpoints of informants, it is possible to understand that limited involvement of end users of the systems, insufficient feasibility study and others are the project-level factors that negatively affect the sustainability of the introduced systems. This finding is consistent with what Getaw (2017) has identified in his study on Post Completion Sustainability of Ethiopian Railway Project in Addis Ababa Light Rail Transit as the lack of rigorous feasibility study results from the problem of human resource capacity in managing the project which has long term implication on project sustainability.

4.2.2 External Factors

The external factors that affect project sustainability encompass institutional and contextual and each of them is discussed in detail in the following way.

4.2.2.1 Institutional Factors

Institutional factors that have a negative or positive contribution to the sustainability of IT projects are related to the organizational policy frameworks, human resources and system-related factors.

- **Organizational Policy Framework Related Factors**

Having a linkage between the vision, mission and objectives of ERCA with the introduced systems is one of the factors that affect post-project sustainability positively. The vision of ERCA, for instance, “is being a leading, fair and modern Tax … Administration in Africa by 2025…” (ERCA, 2014) Here, the phrase being a leading modern tax administration is the indication of the alignment between the vision of the Authority and the commencement of IT projects. This is because one of the ways of modernizing tax administration is by introducing IT.

On the other side, the absence of organizational policy, strategy and guidelines on what, why, where, how, who to use the customized projects are identified as factors that negatively influence the continuous provision of the introduced system for the desired period.

- **Human Resource Related Factors**

Human resource-related factors that affect project sustainability include the attitude, knowledge and skill of employees and coordination between different actors, staff turnover/retention and others.

The very intention of deploying an information system is to enhance the performance of individuals in particular and organizations in general. Enhancing performance can be possible when users accept the introduced system which in its turn has a positive contribution to the continuity of getting benefits from the introduced system (Davis, 1993). Accordingly, the perception of the Employees of ERCA in using SIGTAS in this regard is discussed hereunder.

Perceived Ease of Use of SIGTAS

The following table and its subsequent narrations present the perception of employees on the extent to which SIGTAS is easy to learn, understand and use.

Table 4.1: Perceived Ease of Using SIGTAS

Items	**Level of Agreement/Disagreement in Frequency and %**				
	1	**2**	**4**	**5**	**6**
I found the SIGTAS platform (system) is easy to learn.	7(7.3)	11(11.5)	17(17.7)	47(48.9)	14(14.6)
I found the SIGTAS platform (system) clear and understandable to use.	7(7.3)	13(13.5)	10(10.4)	49(51.1)	17(17.7)
I found the SIGTAS platform is flexible to interact with other users of the system like IT persons and other professionals of ERCA in and/or outside the branch I am working.	9(9.4)	28(29.2)	23(23.9)	28(29.2)	8(8.3)
I found the SIGTAS platform is flexible to interact with IT personnel whenever necessary.	9(9.4)	28(29.2)	23(23.9)	31(32.3)	5(5.2)
Overall, I found SIGTAS is easy to use.	7(7.3)	17(17.7)	20(20.8)	34(35.4)	18(18.8)

NB: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree responses.

As shown in Table 4.2, 48.9, 17.7 and 14.6 percent of the respondents agreed, have neutral opinions and strongly agreed, respectively on the easiness of its platform while learning. The percentage of respondents who expressed their views as agreed, strongly agreed and disagreed on the clarity of the platform of SIGTAS constituted 51.1, 17.7 and 13.5, respectively. The finding of the study in this regard is consistent with the earlier study conducted by Tesfaye and Atiklt (2011:64) on the design and implementation of business process reengineering described that "from the perspective of operational employees of ERCA, 65 % of the employees believe that they have the ICT skill required for the job."

Although the majority of the respondents have agreed as SIGTAS is easily understandable to use, information obtained from interviewees has shown that it is difficult to learn and understand the features of the system, especially for newly hired staff of ERCA. This difficulty has resulted from a lack or insufficiency of refresher and induction training opportunities for those who have certain work experiences and newly joined staff in the Authority, respectively.

Hence, it is difficult to conclude that all users of SIGTAS are of equal status in their knowledge and skill to make use of the introduced systems although the majority of the respondents noted as SIGTAS is easy to learn and understand.

The percentages of respondents who agree and disagree on the flexibility of SIGTAS to interact with fellow employees and in and outside their respective branches are equally represented in the table, that is, 29.2 percent each and followed by respondents who are neutral 23.9 percent. Similarly, 32.3, 29.2, 23.9 percent of respondents have expressed their agreement, disagreement and neutrality, respectively, on the flexibility of SIGTAS to interact with IT personnel whenever necessary. An informant from the Tax Audit business process in Addis Ketema Small Tax Payers Branch reveals that "there is no online interaction with IT experts and other fellow staff. When we face a problem, we are expected to write a memo to the immediate boss and our boss to the business process owner and the process continues…."

From here, it is possible to conclude as there is a knowledge and skill gap among users of SIGTAS and the inflexibility of the system which results in impeding online communication among users and IT technical experts to share information, get support from each other and others.

Perceived Usefulness of SIGTAS

The following table and its subsequent narrations present the perception of employees on the extent to which SIGTAS is useful for them mainly to be effective and efficient while undertaking their day-to-day activities.

Table 4.2: Perceived Usefulness of SIGTAS

Items	**Level of Agreement/Disagreement in Frequency and %**				
	1	**2**	**3**	**4**	**5**
Using SIGTAS has improved my effectiveness in doing my job.	5(5.2)	12(12.5)	16(16.7)	46(47.9)	17(17.7)
Using SIGTAS has improved the quality of the work I do.	3(3.1)	12(12.5)	14(14.6)	51(53.1)	16(16.7)
I found SIGTAS to do what I want to do.	3(3.1)	25(26.0)	21(21.9)	36(37.5)	11(11.5)
Using SIGTAS has helped me to accomplish my tasks more quickly.	9(9.4)	15(15.6)	13(13.5)	40(41.7)	19(19.8)
Using SIGTAS has made my job easier or lightened.	6(6.3)	13(13.5)	17(17.7)	47(49.0)	13(13.6)
Using SIGTS has improved my performance.	3(3.1)	14(14.6)	22(22.9)	44(45.8)	13(13.5)
Using SIGTAS has improved my productivity.	7(7.0)	10(10.4)	20(20.8)	50(52.1)	9(9.4)
Overall, I found SIGTAS is helpful in my job.	3(3.1)	9(9.4)	13(13.5)	55(57.3)	16(16.7)

NB: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree responses.

Concerning the usefulness of SIGTAS, as Table 4.2 has shown, 47.9 percent of the respondents have agreed that it helps to improve their effectiveness in providing services. Also, 53.1 percent; the majority of the respondents agreed as SIGTAS has improved the quality of

work that they are working on. 57.3 percent of the respondents have agreed that SIGTAS is generally important for their job.

37.5 percent of the respondents agreed that SIGTAS helps them with what they want to do and followed by 26.0 percent have disagreed. Informants described that SIGTAS is helping them to be efficient and effective in different instances even if it is not as intended. From this, it is possible to understand that respondents believed SIGTAS as useful for them to be efficient and effective. Conversely, an informant has explained as there is resistance from the employees' side by considering the technology as a spying mechanism to check who is doing what by the government instead of taking it as a facilitating mechanism.

Conversely, the difficulty of getting access to delete mistakes while assessing the declaration of taxpayers, lack of interface with banks and other concerned bodies, incompatibility with the existing tax proclamations, encountering of system's unknown errors and so forth are described as testimonies that SIGTAS is not helping to do what they want to do.

The existence of high turnover as well as the knowledge and skill gap of IT and non-IT expert whose work is related to SIGTAS and E-tax is also described as a challenge to the sustainability of the systems. A study was done in LTO on E-tax by Samuel (2015:) has supported this argument as "there is frequent turnover of staff as a result of which there is a shortage of and/or lack of trained personnel to provide support and to run the e-filing." It is mentioned by informants that the non-functionality of some of the modules of SIGTAS has resulted from the knowledge and skill gaps of the users in different business processes of the Authority.

Nurdin, Stockdale and Scheepers (2012) have found that teamwork is needed among those who have a concern with all activities of project work for the sustainability of information system projects. Conversely, the problem of harmonization between the IT people and functional staff as well as managers is cited as a challenge in the Authority. An expert in ITMD has explained that "there is a perception that all IT-related issues in the organization are to be owned by ITMD. From the business process owner's side, a team leader in Addis Ketema Small Taxpayers Branch has a counterargument for this point by explaining as it is not a matter of lack of ownership on the business process owners' side. But what matters is the knowledge and skill gap that they have in the technical aspects of IT as informants indicated.

By taking the information taken from informants and respondents into account, it is possible to conclude that the users of SIGTAS have a positive attitude to the technology and which in its turn has a positive contribution to its sustainability. But the skill and knowledge gaps of users of SIGTAS and insufficient coordination among IT and non-IT staff of ERCA have been identified as a challenge to the sustainability of the project.

- **System Related Factors**

It is mentioned by informants that SIGTAS and E-tax are administered centrally mainly by ITMD. The centralization of the system has both positive and negative sides. Creating confidentiality of the data of the taxpayers and the Authority is among the positives of the centrality of the systems. But the centralization of the systems has its own limitations as discussed by informants. For instance, when there is a human error in capturing data and/or calculation of tax assessment for the declared ones, the system gives the authority of deleting the mistakes to the ITMD. The required processes to delete errors in the assessment are as follows. For instance, when experts who work in customer service business process face a problem, he/she is expected to write a memo to the team leader, then the team leader to the business process owner, and if the problem is beyond the capacity of the business process owner, a letter

will go to the ITMD. Thus, the hierarchical nature of the decision-making process negatively affects the sustainability of the project. On the other hand, the Director of ITMD has admitted the importance of being centralized for some of the functionalities of SIGTAS. According to him, "for security reasons, some of the cases are managed centrally like deleting assessment." Nurdin, Stockdale and Scheepers (2012) have argued in this regard that there is a mismatch between the centralization management system and IT-based services in public organizations in African countries.

There is a programming error in both SIGTAS and E-tax which are only known by system developers. For instance, although the data are encoded, there are times when the system shows nothing. When a programming error has occurred which is beyond the capacity of ITMD, it is difficult to proceed to the next step till the case will be communicated to the system developer CRC Sogma Inc.(which is based in Canada) through ITMD and till then the day-to-day activities are undertaken payment is done by hard copy or manually.

Here, a tax auditor in LTO has argued that the causes of programming errors are not only due to the problem of the system itself but also the lack of skills on the users' side. Also, system disruption as a result of power fluctuation and other cases have their own contribution to the programming error.

The absence of interface with external stakeholders like banks, the Ministry of Trade, the Ethiopia Commodity Exchange Authority (ECX) and others is still a challenge for the taxpayers and the tax Authority too.

Thus, it is possible to conclude that most of the system-related problems lie in the skill gap of the users and insufficient knowledge and skill transfer by the system developers. Also, the hierarchical management system of the technology (centralization), absence of interface of the systems with banks and other pertinent organizations and online communication among users and between users and decision-makers are taken as challenges to the sustainability of the technologies.

- **Contextual Factors**

Policy Framework, the condition of taxpayers, network and electric power are among the identified contextual factors that affect the sustainability of projects in the Authority.

Policy Frameworks

Informants have identified as there is an incompatibility between the revised 2016 Income Tax Proclamations with SIGTAS. For instance, under Article 37/1 of the Proclamation, for Mining and Petroleum operations, "the business income tax rate applicable to a licensee or contractor is 25%." But in the 2002 Proclamation, its rate was 35 % and still, SIGTAS is not adjusted according to the amended proclamation.

At times, some issues are included in the Proclamations but not in the system. For instance, Article 87 of the 2002 Income Tax Proclamation declares the penalty of the understatement of tax declaration that the taxpayer is expected to pay 10 percent of his/her understatement. But the system cannot calculate this understatement and manual work is its way out. In addition, the pension of the private organizations' employees is collected manually since employees have no personal TIN. Thus, the private organization pension proclamation is not treated through the system. Furthermore, in Articles 51(10) and 52(e) of the FDRE constitution, the Federal Government and Regional states, respectively have the power to generate revenue from their

respective tax. But since the revenue sharing module is not functional, the sharing is performed manually. Also, the e-tax in ERCA has no legal backing (Samuel, 2015).

Therefore, both the inconsistency between the introduced IT systems and national and organizational policy frameworks and the absence of policy frameworks are challenged to the sustainability of the introduced systems. Therefore, the finding of the study is consistent with what Hutaserani & Bayley (2010); Gichoya (2005) have revealed as that the frequent changes in government policies and regulations and lack of policy, respectively results in the in-continuity of the benefits of e-government projects.

The Condition of Taxpayers

In the utilization of IT, as internal users of SIGTAS and E-tax, taxpayers have a lot of challenges including knowledge and skill gaps to use the systems, high turnover of trained IT experts who work for taxpayers, difficulty in using the schedule of the Authority properly and others have negative implications for the proper utilization of the systems.

Network and Power

Limited internet connection (network) and electric power fluctuation are identified as challenges to the sustainability of the IT systems. Serving many customers at a time and the limited capacity of SIGTAS due to the ever-increasing number of taxpayers are the main reasons for the network problem. According to informants, most system failure has also resulted from unexpected electric power interruptions.

5 Conclusion

To sum up, it is difficult to say that IT projects introduced to administer tax in ERCA are sustainable to some extent. Although SIGTAS and e-filing projects are handed over and have become functional after passing through the project processes, it is possible to conclude that the projects are termed as "challenged projects." Challenged projects according to Putnam (2007) are to mean failed to constitute "all functions and features" that the projects initially intended to provide for users.

The inability of conducting a rigorous feasibility study to set the scope and deliverable of the projects, insufficient engagement of project stakeholders' especially internal and external users and functional unit managers at different levels and others in all project management process groups from their outset are the project level or internal factors which harm the sustainability of IT projects.

The high turnover of IT experts and their knowledge and skill gaps especially on how to provide support for the non-IT people, inadequate harmonization between staff working in IT and non-IT functional units, and insufficient induction training given for staff in different business processes are the external institutional factors that are affecting the sustainability of IT projects negatively. The absence of organizational policy and guidelines, incompatibility between the national principles with the introduced technologies and electric power problem, the knowledge skill and attitude gaps of the taxpayer are among the bottlenecks to sustain the IT systems.

6 Recommendations

- Decision makers and employees of the Authority should give due attention to conduct a rigorous feasibility study and engaging users and other stakeholders to identify their needs and expectations in the process of project endeavors,

- ERCA needs to create a regular discussion forum among the internal stakeholders to identify the day-to-day pertinent challenges of the introduced systems and to set directions accordingly in a sustainable way,
- Concerning human resources, the root causes of the turnover of IT experts need to be studied and strategies should be designed to increase their retention rate, Also, their knowledge and skill gaps need to be bridged through on the job short-term training and long-term educational opportunities,
- ERCA should design organizational policy and guidelines mainly to govern the products of the IT projects systematically,
- The Authority should work with the concerned federal stakeholders to create alignment between the existing national frameworks and the introduced IT systems, and
- Further study needs to be conducted especially on the technical problems of the introduced systems.

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