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ICT and Tax Administration in Sub-Saharan Africa: Adopting ITAS in Uganda and Sierra Leone

Giovanni Occhiali, Doris Akol and Philip M. Kargbo

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Summary

The adoption of information and communication technologies (ICTs) in the public sector, including for tax administration, has been hailed as potentially transformational over the last few decades. Its impact has been less far-reaching than imagined. A literature examining the determinants of – and obstacles to – ICT adoption arose as a result, almost exclusively focusing on the experience of high-income countries. However, understanding the experience of adoption in low-income countries is equally important, especially given the potential role that ICTs can play in tackling various development issues, including increasing mobilisation of domestic revenue. To help fill this gap, we present two in-depth case studies of the process of adopting an integrated tax administration system (ITAS) in Uganda and Sierra Leone, based on a series of semi-structured interviews with members of the respective revenue authorities and ministries of finance.

Our analysis shows that many of the factors that facilitate and impede the adoption process are the same as those identified in high-income countries. However, we also identify some factors that are more likely to be relevant for low-income countries. These include the impact of the timeline for disbursing donor funding, the processes donors require to be used for procurement, and the quality of legacy data to be migrated into the new system. The need to embark on change management and re-engineering business processes was also recognised more fully than might have been expected in countries with relatively little prior experience in e-government services.

Keywords: ICT adoption; tax administration; low-income countries; case studies.

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Acronyms

BPR	Business process mapping and re-engineering
COTS	Commercial-off-the-shelf
DFID	Department for International Development
ECR	Electronic cash register
EOI	Expression of interest
GST	Goods and services tax
ICT	Information and communication technology
ITAS	Integrated tax administration system
LIC	Low-income country
LTO	Large Taxpayer Office
NRA	National Revenue Authority
OECD	Organisation for Economic Co-operation and Development
PFM-ICP	Public financial management improvement and consolidation project
RA	Revenue Authority
TIN	Taxpayer identification number
URA	Ugandan Revenue Authority
VAT	Value added tax
VIPS	Value added tax information processing system

1 Introduction

Over the past few decades, the incremental role that information and communication technologies (ICTs) have played in the public sphere has given rise to the term ‘e-government’ – this has come to define all types of ICT-mediated public services (de Vries et al. 2018). The world of tax administration has also been informed by this development – from pre-compiled tax returns to online filing and payment, ICTs promised simpler fulfilment of taxpayers’ obligations and lower compliance costs. The increased availability of digitised taxpayer information has also been hailed as useful for the growing relevance of evidence-based policies (Bird and Zolt 2008).

Despite these high hopes, the actual pace of ICT adoption by public administrations often proved to be slower than predicted, and its impact less far-reaching (Bekkers 2007; Savoldelli et al. 2014). Consequently, there was much investigation of the institutional and individual barriers to successful ICT adoption and diffusion (Ebrahim and Irani 2005; Lam 2005; Vassilakis et al. 2005; Nurdin et al. 2011; Savoldelli et al. 2014), as well as the necessary prerequisites for them (Rogers 2003; Karch 2014; Zhang et al. 2014; de Vries et al. 2018). Although this literature made an important contribution to our understanding of these processes, it had one shortcoming – with a few exceptions (Elbeltagi et al. 2005; Gupta et al. 2008; Bwalya 2009; Blume and Bott 2015; Al-Refaie and Ramadna 2017), the vast majority of studies focused on the experience of high-income countries.

However, understanding the constraints to ICT adoption in low-income countries (LICs) is equally important, as many claim that ICTs can help solve various development challenges (UNCTAD 2008; UNDESA 2014). While conclusive evidence is still lacking (Heeks 2010), ICT adoption has been linked to an increased growth rate (Aker and Mbiti 2010), firm productivity (UNCTAD 2006; World Bank 2006) and employment generation (World Bank 2009). A growing literature has also explored how ICT adoption can support tax administrators in LICs (see Bird and Zolt 2008 for a seminal study, and Okunogbe and Santoro 2022 for a recent review), focusing on how introducing different types of ICT impacts the daily life of tax officers and taxpayers.

The literature also shows that there are several instances in which different types of ICT reform in tax administration have failed to deliver the expected results due to infrastructural, human and institutional factors (Okunogbe and Santoro 2022). These obstacles, relevant for any technology, are especially crucial for ‘foundational’ ones – technologies that impact on all facets of tax administration. This is because reforms introducing a technology of this type generally involve profound changes in an organisation’s business model, and also take a long time, are costly and usually complex to pursue. When these reforms fail, or deliver significantly worse results than those expected for avoidable reasons, a substantial amount of time and resources is wasted, and reverting to the previous business model might be impossible. Given a lack of specific focus in the literature, a better understanding of how the implementation process of foundational ICTs impacts on the likelihood of their successful adoption in LICs might contribute to reducing this waste of resources.

This paper contributes to filling this gap by presenting an in-depth analysis of the adoption of two integrated tax administration systems (ITASs) by the Ugandan Revenue Authority (URA) and the National Revenue Authority (NRA) of Sierra Leone. They adopted these systems in the late-2000s and early 2020s respectively. An ITAS is a package of different functionalities, which allows tax officers to deal with all domestic obligations of a taxpayer within a single window, potentially greatly increasing the efficiency of tax administration (OECD 2019). While ITASs have been in use around the world since the 1990s, for a long time there was

relatively little information that could be readily accessed on their exact functionality, cost, technical requirements and implementation timeline. While this has started to change over the last few years (Jimenez et al. 2013; Blume and Bott 2015; Awasthi et al. 2019; OECD 2019), the number of case studies detailing experience in adopting ITAS – or any other foundational technology – in LICs is still very limited.

Drawing from 12 semi-structured interviews with different stakeholders from Uganda and Sierra Leone, we assess the two ITAS adoption processes from conceptualisation of the reform to the system's impact after adoption. This allows us to show that many of the obstacles and enabling factors faced by the URA and NRA are similar to those highlighted in the literature for high-income countries. Furthermore, we identify other factors that are more likely to be specific to LICs, such as the influence of the timeline for disbursing donor funding and the processes donors required to be used for procurement. Our analysis should be of interest to revenue authorities in low- and lower-middle income countries that are planning to undertake foundational ICT reforms, and to academics interested in the process for adoption of technology in public sector organisations.

The remainder of the paper is structured as follows. In section 2, we present a brief review of the literature and explain how it informed our methodology. In section 3 we provide a detailed account of the process of ITAS adoption in both countries. Section 4 gives a comparative analysis between the two experiences, as well as the parallels with other cases in the literature. Section 5 concludes.

2 Literature and methodology

The first part of this section presents a brief review of the literature on conceptualisation of different stages of e-government, as well as on the factors facilitating – or impeding – the diffusion of ICTs in public administration. The second part describes how the literature informed our methodology for the study, gives some general information on our informants, and reflects on the limitations of the study.

2.1 Literature review

The introduction of ICTs within the sphere of public administration to support policy formulation, implementation and evaluation is defined in the literature as adaption of e-government (de Vries et al. 2018). In e-government literature, the role of ICT is not limited to providing better services and information to citizens. Rather, ICT has an articulated function, helping to develop strategic connections within public sector areas, enhancing sharing of information, and thus increasing government capacity to implement complex policies (Ebrahim and Irani 2005). However, the introduction of ICTs does not always create the desired impact on public administration processes. According to Bekkers (2007), whether ICTs create any change depends on the context in which they are implemented – their introduction is not neutral, but happens within a given political context. Rather than innovating administrative practices, the introduction of ICTs can also 'strengthen the existing frames of reference, power relations, structures, processes and positions' (Bekkers 2007: 106).

The literature also suggests that more sophisticated e-government arrangements are usually achieved in progressive stages (Baum and Di Maio 2000; Hiller and Belanger 2001; Layne and Lee 2001; Ronaghan 2001; Wescott 2001). Although described with different names, these stages are broadly conceptualised as: first, providing information, followed by allowing

transactions, then integrating different services, and, ultimately, transforming the type of services provided. However, embarking on one of the stages gives no guarantee of proceeding any further. In fact, despite decades of investment, the pace of adoption of e-government is still low in most countries around the world (Savoldelli et al. 2014). A study of local governments in the United States showed that most of them quickly embraced basic e-government – offering information on their websites – but did not move to more sophisticated stages (Coursey and Norris 2008). Furthermore, using the example of a local council in London that claimed to have reached the most advanced stage, Weerakkody and Dhillon (2008) show that there were still so many process deficiencies that the services offered could hardly be defined as transformational. Their study shows that, more than technical issues, it was the lack of a change in business model by the local council that was the biggest obstacle to better service delivery.

Adoption of e-government often encounters several obstacles, including issues with IT infrastructure or skills, data security and privacy, organisational resistance, and the cost of reform (Ebrahim and Irani 2005). Looking specifically at organisational barriers, Nurdin et al. (2011) divide them between lack of adaptability, lack of involvement of relevant stakeholders, excessive bureaucracy, and unclear reform mission. Often what blocks e-government reforms is a combination of all the above factors. This was the case in Zambia, where 'lack of adequate ICT infrastructure and political will, provision of content in English rather than local languages, lack of proper change management procedures, and non-contextualisation of e-government practices' (Bwalya 2009:1) contributed to derailing an e-government reform in the health sector. A similar picture emerged from a study of many public organisations in Jordan, although in this case technological barriers were more frequent than organisational ones (Al-Refaie and Ramadna 2017). In a study from 55 large US cities, Ho (2002) shows how the interaction between organisational factors – limited staff and funding, and socio-economic factors – little demand for internet services from low-income populations, created a barrier to further adoption of e-government.

However, these are not the only available conceptualisation of barriers to adoption. Vassilakis et al. (2005) survey different stakeholders involved in reform of e-government in the UK, Spain and Greece. These identified the existence of legislative, administrative, technological, user-culture and social barriers to adoption of e-governance. They also suggest addressing legislative barriers first – usually relating to data confidentiality, and user related barriers afterwards, as systems often need a critical mass of users to function properly.

Furthermore, not all barriers are equally important for all types of reform. Countries at a more mature stage of e-government, aiming to make services more centralised and cohesive for citizens, are less likely to face technical issues, and more likely to have problems with change management, pooling of information, and coordination of stakeholders within government (Lam 2005). Similar conclusions were reached by Sarikas and Weerakkody for the UK, where the 'focus should now move from front end interface design and linking web sites to internal business process and information systems reengineering' (Sarikas and Weerakkody 2007:168). Or, in the case of Danish Customs organisation, which should think about a 'fundamental re-orientation of the role and function of [its] organisation as part of a network that offers services to citizens and businesses' (Henningson and van Veenstra 2010:10). What emerges from these studies is that the more advanced the level of e-government, the more common organisational issues become. New ones, such as a lack of common standards across different government agencies, potentially leading to fragmentation of public services, also start to emerge (van Veenstra et al. 2011).

Another aspect of e-government that has received some attention in the literature is diffusion of successful innovation. Diffusion is 'a process in which an innovation is communicated through certain channels over time among the members of a social system' (Rogers 2003: 5). The diffusion literature was recently covered by both a meta-analysis (Zhang et al. 2014), and a meta-synthesis (De Vries et al. 2018). Both articles show that research on e-government diffusion has taken place across a variety of fields – sociology, political science, management, communication studies, information systems, public management, public policy and e-government – that often do not speak with each other. Consequently, there is a plethora of models and paradigms to explain diffusion, but they do not overlap – although they are explaining the same process. The authors advise combining these theoretical approaches to leverage their strengths and reduce the weaknesses of each subfield. They also note that most authors treat diffusion and adoption interchangeably, so they recommend future studies clearly distinguish between both processes.

What emerges from this different literature is that the factors that influence diffusion of e-government are varied. Some of the barriers are technological – quality of the internet and ICT infrastructure, while others are organisational – distribution of power across government agencies, availability of under-used resources and frequency of consultation with stakeholders (Yeloglu and Sagsan 2009; Walker 2014; Zhang et al. 2014; De Vries et al. 2018). Environmental factors, such as cultural norms, income level, gender ratio or ICT literacy, are also important (Zhang et al. 2014; De Vries et al. 2018). However, not all these factors receive the same attention across all strands of the literature. Researchers from the fields of public management and public policy focus more on macro-institutional ones, whereas e-governance literature addresses those related to individual aspects (De Vries et al. 2018). Institutional mimicry also tends to be more important than geographical proximity in explaining diffusion patterns. Using the US as an example, Karch (2014: 13) shows how policy lessons are diffused across states because 'officials are under pressure to enact a policy that exists elsewhere, because they imitate the policy choices of their counterparts in states that share a policy-relevant characteristic, or because they emulate successful policies'.

Finally, there are a few examples of studies from the grey literature focusing on the public revenue authorities' adoption of ICT in general (OECD 2016), or ITAS specifically (Blume and Bott 2015; OECD 2019; Awasthi et al. 2019). The first study to focus specifically on the latter is Blume and Bott (2015), who analyse the experience of implementation in 13 developing countries that acquired their ITAS from some of the most successful providers in the market.¹ The study stresses how important planning in the pre-implementation phase is for the successful deployment of these systems. The countries that achieved the best results were those that dedicated enough attention to initial evaluation of staff skills; identified change champions, and, if none could be found, made sure that external support could be available from the beginning; and ensured that donors were behind their implementation plan (Blume and Bott 2015). Dividing the implementation project into smaller and manageable segments, each having specific deliverables and measurable key performance indicators, while maintaining a holistic approach to how ITAS will fit into wider tax administration reforms, also boosts the chances of a positive impact (Blume and Bott 2015; OECD 2019). Given the likely role of donor funding, and the unique requirements of the system, it can also be useful to review standard procurement rules to understand if they are fit for purpose, and, if not, to rely on donors' processes for procurement, as well as contacting organisations that implemented the same solution (Blume and Bott 2015).

¹ These are Bangladesh, Burundi, Ethiopia, Ghana, Mozambique, Nepal, Peru, South Africa, Swaziland, Senegal, Tanzania, Uganda and Zambia (Blume and Bott 2015).

A government interested in implementing an ITAS has three broad technical solutions at its disposal: in-house development, buying a commercial-off-the-shelf (COTS) system, or purchasing best-of-breed components, which can be combined to solve some of the most common administrative issues (Blume and Bott 2015; OECD 2019; Awasthi et al. 2019). Which solution is the best in each specific case depends partly on the technical capabilities and governance framework of the tax administration (OECD 2020). For example, in the early 2010s the Finnish government decided to acquire and implement a COTS solution to replace over 70 legacy systems (OECD 2019). This was eventually identified as the preferred option despite a high initial cost, as it avoided likely failures in day-to-day business management that could have been connected with in-house development. Furthermore, the Finnish tax administration could rely on the experience of other tax authorities with the same system, which showed a quick return on the initial investment (OECD 2019). A different example is provided by the South Korean tax authority, which developed its own ITAS in-house, with the objective of increasing tax compliance while reducing its costs, and eradicating practices of the shadow economy (Awasthi et al. 2019). While a COTS solution was also considered, the experience with business process re-engineering and ICT development accumulated over the years by the authority convinced them that the benefit of a system perfectly tailored to their needs outstripped the risks (Awasthi et al. 2019). This case study stresses how important it is for an authority to be aware of its own capability and maturity before embarking on reforms that are likely to take many years to be fully implemented.

2.2 Methodology

As the above review demonstrates, there is a plethora of alternative theories and approaches to the study of ICT diffusion, including barriers to it, as well as ICT adoption and acceptance. Rather than subscribing specifically to any one theory, in the spirit of what is suggested by Zhang et al. (2014) and De Vries et al. (2018), we draw from all the insights available in the literature, although with a closer connection to studies that focus on public financial management. We mainly focus on the adoption process, rather than investigating how ITAS was diffused to either country, although we make some brief comments on the topic. Specifically, we break adoption down into four different but interrelated stages – planning, procuring, implementing and deploying/upgrading. For each, we gather information on what we consider its most important aspects through a section of our interview's guideline (see Appendix 1). It is worth stressing that, while the four stages identified are similar to those used in the literature (Blume and Blott 2015), they arise as much from a careful reading of the literature as they do from the authors' experience with ICT reform.

The first stage is planning – how the decision to implement an ITAS was first conceived, how big a role previous experience with ICT systems played in devising its scope, the type of technologies that were initially considered, and what companion reforms were envisaged. This focus arises from recognition in the literature of the importance of planning complex reforms extensively before moving onto the implementation stage (Blume and Bott 2015; OECD 2019), the incremental complexity of successive e-government reforms (Baum and Di Maio 2000; Layne and Lee 2001; Ronaghan 2002; Awasthi et al. 2019) and the need to have a holistic approach to ICT implementation (van Veestra et al. 2011; Savoldelli et al. 2014; Blume and Blott 2015; De Vries et al. 2018).

The second stage is procurement – the focus is mostly on understanding the interaction between national and donor-mandated procurement strategies, as well as any potential issue encountered in the process, both of which are important in determining reform success (Blume and Blott 2015; OECD 2019).

The third stage is implementation – specifically, we consider potential divergences between the planned and actual timeline and budget, experience with piloting, the coexistence between ITAS and legacy systems, the role of staff attitudes, and the execution of companion reforms. Many of these factors have been emphasised in the literature as significantly connected with the final reform outcome (Ebrahim and Irani 2005, Nurdin et al. 2011, Blume and Blott 2015)

The fourth stage is deployment – here, we concentrate on the foreseen and unforeseen impact and challenges of the technology, as well as any experience with its upgrade – a critical factor to consider for a technology expected to be in place for a long period of time (Blume and Blott 2015).

All information was obtained through semi-structured interviews conducted by the authors, both in-person and online, between August and December 2021. A total of twelve interviews were held, all lasting between one and two and a half hours – six for Uganda and six for Sierra Leone. All informants were directly involved in all or some of the ITAS implementation stages in the two countries under analysis, and all of them held executive or managerial positions in the respective revenue authorities, ministries of finance or technology suppliers. One informant was involved in the implementation of both ITAS projects, although they had different functions in the two countries.

Some consideration of the limitations introduced by our selection of informants is also necessary. First, as most interviewees were involved in the two projects' conceptualisation and implementation, it might be reasonable to expect a particularly lenient assessment of potential organisational shortcomings. While this expectation is understandable, it should be apparent in the following sections that members of both countries' institutions were critical of different decisions taken during the implementation process, and were frank about their consequences. Nevertheless, in other instances their assessment of the process might have been influenced by their role in shaping it. Second, all interviewees from governmental organisations were in managerial positions, and will have experienced the reform process in a different way to rank-and-file officers. A focus on the experience of the latter would probably have revealed different elements that shaped the reform process. We recognise this as a limitation, as there is a branch of the literature that mostly focuses on the role that characteristics of individual users play in determining the outcome of ICT adoption (Elbeltagi et al. 2005; Gupta et al. 2008). Future studies including a stronger focus on the personal experience of tax officers in low-income countries with the training offered and overall change management strategies might help to fill this gap.

3 Case studies

The following sub-sections present the two case studies, starting with Uganda and moving on to Sierra Leone. In both cases, we first describe the reasons that led to the decision to pursue the implementation of ITAS, then move to the procurement process and implementation phase, while also reflecting on the impact of implementation and the lessons learned. Comparative considerations are presented in Section 4.

3.1 The introduction of ITAS in Uganda

The URA was established in 1991 as a semi-autonomous revenue administration, and its mission includes the use of modern business processes and technologies in revenue administration. Following the introduction of value added tax (VAT) in 1996 and the creation

of a Large Taxpayer Office (LTO) in 1998, it became apparent that there was a need to upgrade the basic IT systems in place at the time, and to consolidate all information into a single system. The adoption of an ITAS could be seen as natural progress in the reform path that underpinned the creation of the URA, and one of the building blocks of modern tax administration in Uganda.

The first funding for an ITAS system was made available by donors in 1999 (A, B).² Some of these funds were used for benchmarking visits to countries that were using or implementing similar systems, as well as to further conceptualise the role that an ITAS could play in Uganda. However, there was a general lack of internal support for the reform – the concept of an ITAS was still relatively new, and there were few examples of countries with comparable systems in place for long (A, B). Furthermore, the establishment of the LTO in 1998 showed that the URA was facing some challenges with regard to change management, which is vital in these types of reform. As a consequence, the reform process came to a halt.

However, this initial impetus achieved some results. First, it established that business process mapping and re-engineering (BPR) was a crucial pre-requisite for introduction of an ITAS. Second, a critical mass of middle-level staff became more knowledgeable about the existence of different types of ITAS and their function. Many of these staff would later form the project team that implemented the ITAS after the reorganisation of URA (A, B).

There were different reasons why the URA had considered implementing an ITAS as early as the late 1990s. First, manual processes created delays in administration and low data quality, leading to poor service delivery to taxpayers. URA offices always had long queues of clients, who had to manually collect and file their returns and other records. Second, the automation of processes and systems, which began with the Department of Customs, spurred an interest in the role that automation might play in other tax administration processes. The wider automation of tax administration was seen as a way to create consistency in service delivery across different URA departments. Third, significant time was spent generating information for management decision-making, statistical use and planning. Collating tax data was extremely difficult in a manual environment, and data accuracy had to be ensured each time. This consumed a lot of resources, creating an inadequate environment for service delivery (C).

The design of the URA ITAS was influenced by the challenges experienced in this manual environment. It was understood that there was a need to reorganise business processes, keeping what worked well and getting rid of processes that didn't add value. Understanding how deeply the whole tax administration process had to be redefined became paramount, and the discussion quickly moved away from which off-the-shelf solution would be better to buy, towards a general BPR (B, A).

3.1.1 From business process re-engineering to procurement

The result of the BPR was a blueprint of system architecture for the ITAS, describing how the envisioned functionalities would contribute to resolving the limitations and inefficiencies of existing processes, including how to use staff more effectively. The BPR process directly led to the development of ITAS user requirements, which were modelled along the lines of the system used by the Australian Tax Office. This process also made it apparent that a redesign of the organisation structure was needed, particularly in the domestic taxes department, with rationalisation along tax administration functions becoming the preferred solution (A).

² To ensure the anonymity of our informants while ensuring traceability of information, we refer to them with randomly assigned alphabetical letters throughout this section.

The gathering of system requirements, which targeted those who would become the final users, started in 2001. The objective was to identify and retain processes that were foundational and necessary in tax administration, while dropping those that were not critical, or which could lead to conflict and duplication. Thanks to users' involvement from the beginning, there was an immediate and enduring ownership of future system specifications. The process of submitting – and defending the submission – of each system requirement to a steering committee ensured that only vital processes would be kept in the system. As the steering committee comprised users from different departments – legal, procurement, IT, domestic taxes, customs and others – all perspectives were taken into account, and the process enhanced consensus and ownership of user specification requirements across the Authority (A).

It soon became clear that, to develop a system meeting all user requirements, a vendor of very high capability was required. Due to the existing IT capacity in the Ugandan market, this implied that only international suppliers would be eligible to bid for the system. However, it was also understood that the vendor would need to acquire knowledge of local conditions if they were going to be able to provide solutions appropriate to the circumstances of an LIC with a significant informal economy. These would have been extremely hard to find with a traditional off-the-shelf system.

A two-stage bidding process was used for procurement. The first was to issue an Expression of Interest (EOI) document to attract all potential bidders – this allowed for the evaluation of a wide array of candidates. The detailed bidding document was then only sent to bidders selected after the EOI screening, with evaluation of the actual bids constituting the second stage. The entire process took about ten months, and consisted of technical evaluation of bids and site visits to inspect how comparable technologies had been deployed. These due diligence visits were used to evaluate system implementation, and thus obtain corroborative evidence from users on whether the system was working and how it was being maintained by the vendor.

The committee that evaluated the bids included procurement specialists, IT professionals, tax and business analysts, legal officers and future users of the system. This enabled evaluation of the bids along all parameters that had been included in the system specification document. After each stage, management decision-making from the steering committee was required, ensuring that management was fully involved throughout the process. The evaluation team was joined by the Commissioner General and other senior managers during negotiation. This led to ownership of the outcomes, as both managerial and technical teams were involved in the eventual decision-making about acquisition of the system. It is also worth noting that a donor-funded consultant who provided advice and guidance during technical evaluation was not actually part of the evaluation team, so all decisions were fully-owned internally.

Various lessons were learned during the procurement phase. First, although the two-stage process was very lengthy and complex, requiring a no-objection at all stages, it proved to be the right process to follow for a procurement of such magnitude and complexity. The administrative reviews and various other documents produced in the process proved vital to answering complaints filed by unsuccessful bidders, which are inevitable in a procurement of this size. Nevertheless, there was also an incident involving some missing documents from the initial procurement stage, which created various delays. As internal sabotage was suspected, this taught the team to be meticulous in record-keeping, and to keep duplicates of each document. Second, having the staff involved as part of the core team in gathering requirements for the evaluation of bids ensured consistency between the required system specification and solutions selected.

However, it proved equally important to have senior management involved from the earliest stages of procurement, as this ensured their confidence in both the process and the outcome. Indeed, the importance of management support warrants further elaboration, as the lack of it was one of the reasons why the project did not proceed in the late 1990s. After the restructuring of URA in 2004, the backing of the new management team was crucial to pursue ITAS implementation, which was part of a wider modernisation project. Continuous management support was critical in keeping the project on course, as each decision that disrupted existing methods of work required management approval (A, B).

Disruption of existing working arrangements did, however, require more than management support. This was recognised by the URA, which set up a robust change management strategy, training both staff and taxpayers throughout the whole implementation process. Training taxpayers well ahead of their needing to use the system had a strong positive impact on their view of the upcoming changes, as it helped them feel ready for the new approach to compliance required by ITAS – which did in fact improve. This might also be linked to the fact that training taxpayers for ITAS also gave the URA a chance to refresh basic taxpayers' knowledge about their obligations during training sessions. Staff training was needed, not only to teach them technical skills, but also to ensure a positive attitude towards the system. ITAS created new ways of working, significantly reducing the discretionary powers that ordinary tax officers held under legacy systems. The removal of these powers led to some resentment, and it was thus imperative to reallocate staff to new roles according to their attitudes and skill sets. Most of those who were unable to adapt to the new system left the organisation voluntarily; a few were made redundant.

3.1.2 The implementation process

The whole process of ITAS implementation was originally planned to take two years. This quickly proved unrealistic, as stakeholder involvement in gathering requirements and specification design, as well as procurement and evaluation of bids, including due diligence visits, took much longer than planned. It is important to note some of the factors that are often ignored when determining implementation timelines, such as the time needed to ensure that: required legislative amendments are passed; vendors can build and test the system with the required specification; and tax agents and taxpayers are trained to a sufficient level. Funding limitations can also impact development and implementation paths, affecting planned roll-out in unforeseen ways. Actual implementation was then done iteratively, with initial modules built and piloted before subsequent ones were developed, to minimise potential funding disruptions (D, E).

The first choice required was the selection of an appropriate pilot office, as this is key for successful implementation. Many organisations start with implementing ITAS in the LTO (Blume and Bott 2015). However, the potential impact of system failure during the pilot phase – both in revenue and service delivery terms – would be greater if large taxpayers were used for piloting. Therefore, the decision was made to use the Kampala East office for the pilot phase, as this decreased the overall risk. Anticipating potential issues, the pilot office was exempted from meeting its revenue collection targets for an agreed period of time, all of its staff received additional training, and a member of the ITAS implementation team was deployed as interim manager (A). As the URA is subject to external oversight by the Office of the Auditor General, management approval to disrupt existing processes was required to minimise adverse audit findings.

Another decision that needed to be taken at the start of implementation regarded data migration. While it is generally considered ideal to include as much data as possible, manual and rudimentary legacy systems often make data migration close to impossible. As the

quality of existing data was one of the obstacles to overcome through ITAS, and some legislative amendments were required to allow migration to the new system, the whole process was eventually abandoned. However, this posed some obstacles, especially regarding imposition and waiver of penalties for late- or non-filing of returns during the period of implementation of the system at the pilot site.

The first module to be implemented was for registration of new taxpayers. The main challenge at this stage was integration of the registration module with customs processes managed in the automated system for custom data (ASYCUDA). Integration of the two systems had to be finalised prior to the roll-out of other modules, so it was essential to establish a cut-off date for migrating to the use of new taxpayer identification numbers (TINs) in customs processes and to block transactions using old TINs. There could be no progress with other modules until the change in registration function eliminating use of the old TINs was complete. Transition to the new system was smooth for large taxpayers and frequent importers in the formal economy, but was more challenging to enforce for smaller traders.

After the integration of the registration module was completed, implementation moved to the second stage – introduction of payment and filing modules. This required the integration of ITAS with the ICT solutions adopted by the banking sector, as well as its harmonisation with other government payment systems. The system had been projected to handle 200 returns for the pilot, but more than 5,000 were received on the first day in which the filing functionality came online because of a massive sensitisation campaign. This number of returns quickly overwhelmed the system, which has not been programmed to handle this level of transactions. This failure led to a review of the choice of system compatible hardware and server capacity, but also spurred wider consideration about the impact of ITAS on URA's vulnerability to attacks and exposure to disaster events. Acknowledging the importance of this impact led to the creation of a disaster-recovery site, which became an integral part of business continuity planning. A second data centre was built off-site to automatically go live and keep the network active in the event of any outages or failures at the main site (D,E). This would also prove important in protecting the URA from issues with the power grid, a common event in low-income countries, and something that should be accounted for when planning system specifications.

As the time for the wider roll-out of ITAS came, a few lessons were learned. First, the importance of using the largest taxpayers as allies quickly became clear. To simplify their operations, large taxpayers mandated all their suppliers and clients to move to ITAS in order to continue dealing with them, leading to faster roll-out of stations beyond the pilot site. This led to taxpayers demanding to be allowed to file electronically, even before the nationwide roll-out started. Tax agents also played an important role, suggesting to their clients they should quickly get onto the new system. The advantages of an iterative approach to implementation were apparent when the wider roll-out took place, as first perfecting the registration module for all major taxpayer segments enabled cross-matching of data across all tax heads. Finally, the importance of having retained a mission-critical group of staff throughout the whole implementation process was also recognised. These individuals were offered contracts under enhanced terms, including higher remuneration, but were also bound to work for the organisation for an agreed period of time. This was deemed necessary because of the creation of a pool of talent that was at risk of being lured away to other organisations that could offer better pay, which in turn could have had an adverse impact on implementation (A, D, B, E).

3.1.3 Impact of ITAS implementation in Uganda and key lessons

The introduction of ITAS led to some significant changes in the process of tax administration in Uganda, most – but not all – of which are positive. The training conducted due to the introduction of ITAS greatly increased the level of computer literacy of staff. This had various knock-on effects, creating enthusiasm and excitement among staff, who acknowledged the investment by management in increasing their skills, while enhancing the quality of data being entered into the system. The analytical skills acquired through the training, coupled with more data availability and better-quality data, also led to improvement in functions such as statistical analyses and audits, both of which became more frequent. Furthermore, while the introduction of ITAS was mostly geared towards improving the processes of the domestic taxes department, organisational benefits were much wider – the whole institution gained from the overhaul of its ICT system. Indeed, ITAS led to the expected creation of a ‘one-sight’ view of the taxpayer, creating new synergies across departments. For instance, goods could be held at Customs as a lien for unpaid taxes; if payments were made to a vendor, the Finance Department would know if the vendor had an existing liability, and the payment could be used to settle the liability (A, B, C).

Thanks to its success and the increased project management capability arising from its implementation, ITAS proved to be the first of many ICT reforms implemented by the URA. It was soon followed by the creation of a data warehouse, an electronic cashbook system, and an app for mobile phones. These improvements in URA capability eventually led to an expansion of its mandate to include collection of non-tax revenue, with other government departments required to interface with ITAS. This initially created resentment towards the URA in general and ITAS specifically, as it altered the status quo in other institutions, but also contributed to speeding up the wider digitalisation of government processes (D). However, although this expanded mandate was a show of confidence, it was not matched with an increase in investment in URA’s capacity. There have been various challenges with implementation associated with data storage and security, servers and staffing as a consequence.

Even though the original focus of ITAS was to simplify and make more efficient compliance enforcement for tax administrators, the system also made it much easier for taxpayers to comply. This mostly happened through the reduction of unnecessary bureaucracy. For instance, all processes were eliminated that required payment of tax at specific bank branches, or handling of taxpayers at specific offices. Taxpayers could now be serviced from wherever there was a URA office, because the system enabled access to decentralised and up-to-date data. This greatly helped to ensure uniformity of services provided across different URA offices, which were now all using the same methods for the same processes (A, E).

While the URA experience with ITAS was overall decidedly positive, its introduction also led to some challenges. Despite the fact that the online functionalities of ITAS decreased compliance cost, the sheer volume of transactions, especially during peak filing times, often caused outages in the network, leading to frustration for taxpayers and staff. Due to Uganda’s relatively poor IT infrastructure, characterised by low internet speed and bandwidth, many clients faced challenges connecting to the network to file returns or seek other URA online services. Some of the planned interfaces with banks and other government departments also failed to take off, or were delayed, due to both change management issues and insufficient institutional capacity. With varying levels of IT readiness across government, many of the ministries, departments and agencies had to play catch-up in order to integrate their systems with URA’s ITAS. This, coupled with little willingness to lose control over collection duty, made the process rather slow (D, E). As previously mentioned, ITAS implementation also increased URA’s connectivity and exposure to IT fraud and attacks, all

of which are associated with revenue losses. While this was expected, less so was the fact that fraudsters could be found among staff, manipulating the system to facilitate tax evasion.³

Some of the most relevant challenges were faced when the moment came to upgrade the system. The URA had decided not to acquire ownership of its source code, leading to charges for all system upgrades or patches required (E). In addition, because many upgrades were handled offsite at the vendor's premises, it was difficult for URA's internal developers to be involved in writing or validating the scripts written for the upgrades, as they would only be involved in user acceptance testing. This has caused frequent delays in rolling out urgent system upgrades. The lesson learnt is that not owning the source code has put the URA at the mercy of the vendor, who must be retained long after the system has been procured, commissioned and implemented (E, A).

3.2 The introduction of ITAS in Sierra Leone

In Sierra Leone, the idea of introducing an ITAS was prompted by experience with previous ICT systems in use at the NRA (F,G,K), and by the understanding that accessing all information about taxpayers' activities through a single window would greatly improve profiling and compliance (F,G,H,J). This was especially important given the prevalence of both manual practices – impacting data quality and process integrity (F,J,K), and a 'silo-mentality' within the NRA (J) – impacting its capacity to share data required to develop evidence-based policies. Awareness of how cumbersome compliance was for taxpayers also played a role – the intention was for ITAS to improve voluntary compliance by reducing its cost (J).

The first experience of the NRA with ICT systems dates back to a few years after its creation in 2002. In 2009-10, the Goods and Services Tax (GST) was introduced alongside the system for its administration, the Value Added Tax Information Processing System (VIPS) (G). This was soon followed by the automation of customs processes with the introduction of ASYCUDA++ in April 2010 (G,I,J). The autonomous department managing GST was merged with the one dealing with income taxes in late 2011. Comparison between the ways in which these tax handles were managed made it clear that an ICT system was also needed for income taxes (G). While introducing an ITAS was first considered at this time, the funding to do this was not available then, and a system was created in-house to fill the gap (G,K). While not exactly successful, the experience of developing a system in-house taught the NRA important lessons (G). First, it showed how hard the process of autonomously developing a system actually is, the type of skills required, and the risks of implementing an untested ICT solution (G). Second, it made it clear that the needs of operational staff, rather than the opinions of the IT department, should drive this type of reform. If operational staff do not own the system, they are much less likely to use it (G,J). Third, it stressed the importance of implementing change management strategies alongside technological reforms, or facing a high risk of failure (G,J). Thanks to this experience, when years later it was time to choose between building an ITAS in-house, bringing in external developers, or buying a COTS solution, the first option could be excluded with little discussion (G).

It is hard to attribute the idea of actually proceeding with ITAS implementation to a single stakeholder, or to a single moment. The NRA, the Government of Sierra Leone (GoSL) and their international partners had all been aware for a long time of the existing limitations in tax administration practices and the potential solutions available in the market (F,G,H,J). Many of the issues connected with prevailing practices were highlighted by different technical

³ The case of Uganda Vs Gaster Nsubuga & Ors is an example of such a fraud attack, <https://ulii.org/ug/judgment/hc-criminal-division-uganda/2018/23> . Also see <https://ugandaradionetwork.com/story/four-remanded-for-hacking-into-ura-computers> . See <https://www.independent.co.ug/week-ura-takes-collection-non-tax-revenues/>.

assistance consultants supporting the NRA, and in particular the domestic tax department (F,J), who made explicit mention of an ITAS as a potential solution. Hence, donors played a vital role in ITAS conception – not only supporting the idea of implementing one, but also providing funds in the form of loans and grants that would not have otherwise been available (G,I,J). However, their extensive involvement was not without problems. The main issue was one of coordination – a variety of different international actors were providing technical assistance to the NRA in the early 2010s (J). The first mention of an ITAS as a potential solution for the challenges faced by the NRA came when the GST and income tax department were merged (G). The UK Department for International Development (DFID) was at that time providing technical assistance for that reform, so they started developing a potential ITAS implementation plan (G). However, soon afterwards the project was moved under the ‘Public Financial Management Improvement and Consolidation Project’ (PFMICP) – a multi-donor initiative launched in 2013 and backed by DFID, the World Bank, the European Union and the African Development Bank (G,J). Unfortunately, coordination between this many donors proved complex – they all had different working processes, and were somehow in competition to be seen as the leader of the initiative (J). Their disagreements eventually led to a falling-out, with most of them withdrawing from supporting the project (G,J). While this is far from being the only reason for the slow pace of implementation, the tension between funders played a role in determining some of the initial delays.

From the beginning a series of complementary reforms were also envisaged as necessary for the successful introduction of ITAS (F,G,J,K). One of these was staff reskilling, as the level of computer literacy among NRA staff directly involved in revenue collection was generally low (F,J,K). It was also important to provide further training to the ICT unit, as this system was significantly more complex to deal with than previous ones (G,J). A general overhaul of the NRA ICT infrastructure was required to minimise issues with the new system, improve network speed, and ensure its security from external attack (G,H,J). There were also other projects – mostly ICT ones – that the NRA thought would gain from being introduced alongside ITAS. Examples of these are the Electronic Cash Register (ECR) system, essential for providing more and better data on GST compliance behaviour (F,I), the ASYCUDA World system, which would allow having real-time customs data (G,I), and the introduction of a data warehouse (F,G).

It is also important to stress that little was known within the NRA about what types of ITAS system existed when the decision to introduce one was taken (H,J,K), the experience of other countries that had introduced one, or about the system or infrastructure requirements (H,J). As no study tour took place (F,H,I,E), this lack of knowledge proved to be an issue for the procurement stage, as much of this information is required to start planning for the process (H). The one thing that was known was that there was no internal capacity to develop the system (G,J), so the choice had to be an off-the shelf technology allowing some level of customisation (F,J). As there was no-one offering this type of system in Sierra Leone, that meant that an international open tender was required (F,J). Another relevant consequence of scarce prior knowledge was that no-one knew exactly how much to budget for the project (H,J).

3.2.1 The procurement process

Lack of certainty about what constituted an adequate budget was one of the issues encountered during the procurement process, which had to take place twice. The first procurement started when the project was backed by the coalition of different donors, and faced multiple challenges from the beginning. First, as the process took place during the Ebola epidemic (2014-2015), the NRA never received support from a specialist with

experience in procuring this type of technology, as no consultant wanted to move to the country (F,J). As a further consequence of the epidemic, the evaluation committee did not have an international expert who might have helped to identify some of the issues encountered later (J). A tender was issued after a first set of system requirements had been gathered, and this received a few different bids. These had to go first through a technical evaluation – which accounted for 70 per cent of the final score, and then a financial one – accounting for the remaining 30 per cent, with all suppliers also having a chance to present their technology (F,J).

After the decision about the winning bid was taken, the selected firm proved to be extremely slow in providing references from previous clients, most of which were not located in Africa (J). As further due diligence was taking place, a combination of internal and external factors led to suspension of the procurement process. Amongst the latter, the World Bank suspected that some inconsistencies might have taken place during the process, some of which were serious enough to be deemed mis-procurement. Amongst the former, the proposed local counterpart of the selected bidder had already under-delivered on a previous NRA-funded project, which did not bode well given the complexity of ITAS implementation (G,I,J).

At this point, the project seriously stalled – the donor coalition was falling out, partially because of the procurement suspension (G,J), and it was not clear if the process could restart. Eventually, the World Bank decided to bear the full cost of the project so a crisis was averted. As a consequence of this change in donor support, the second procurement relied more heavily on World Bank expertise, and this proved key in ensuring a smoother process (H,I,J). While the failure of the first procurement was clearly a setback – the PFM-ICP was signed in 2013, and nothing had been procured by 2016 – it also offered a chance to tackle the issue of the project budget.

The initial budgeting was done by the donors behind the PFM-ICP. There was little consultation with the NRA (I,J) – they were given a project document for which their input had not been requested. The budget allocated to ITAS at this stage was just below US\$2 million, with further funding to become available through savings from the wider PFM-ICP (I,J). As the NRA had little experience with this type of technology, it was not immediately apparent how low this budget was for an ITAS (I,J). After the first procurement failed, the NRA asked a technical consultant who was providing support to a different project, but had previous experience with ITAS, for an external opinion. This confirmed that it was not realistic to implement an ITAS with the available funds (I,J). At this point, the NRA asked the consultant to develop an alternative budget, which was estimated at US\$5.7-5.8 million (I,J). Seeing how big the discrepancy was, in the first few months of 2017 the NRA re-engaged with the World Bank to seek a budget increase. This was agreed, and led to the signing of a new financing agreement for US\$5.7 million in May of the same year (I,J). While this increase was significant, it would later emerge that the budget was still not sufficient to cover the whole project (I,J). However, thanks to donors' flexibility it was often possible to use left-over funds from other components of the project to cover unforeseen expenses (I), but there were moments when the mismatch between required funds and their fungibility led to tension with the supplier (I,J). With the new increased budget and support from a World Bank procurement expert, the tendering process restarted in mid-2017. Four valid bids were received – no particular issues emerged this time, and a contract was awarded and signed in October 2018 (H,I,J,K). However, by this point the project timeline had become very tight.

3.2.2 Implementation

The ITAS implementation timeline was tied to the funding cycle for PFM-ICP from the beginning; this was supposed to end by March 2018 (I). Due to the issues encountered

during the procurement process, it had long become clear to both the NRA and the World Bank that this timeline could not be met. This understanding was reflected in the re-financing agreement signed in 2017 – this extended the timeline to March 2020, giving the NRA about three years to proceed from procurement to full implementation (G,I,J,K). The signing of the contract in October 2018 meant that the NRA had one and a half years to fully implement the project. This time was considered vastly insufficient by all but one of the interviewees (F), and the fact that only 50 per cent of the project had been implemented by the agreed deadline (H) seems to confirm the opinion of the majority. While two further extensions were granted due to the emergence of the COVID pandemic (G,H,I,J), this was not known when the implementation started. Therefore, implementation took place with enormous pressure for the NRA to meet the agreed deadlines (G,H,I,J), with major consequences on how it played out (G,H,J,K) – first and foremost the fact that piloting the system had to be cancelled (F,G,I,J).

In essence, an ITAS includes two sets of modules – outward-looking ones, allowing taxpayers to register, file and pay through the system, and management ones, allowing NRA staff to track taxpayers' compliance, audit and investigate them, and run analysis and forecasts (G,J,K). While implementing both these sets presents its own challenges (I), the second is the one that poses the most (G,J,K). This is because to run analyses, do forecasts and run in-depth audits, a great deal of historical data about taxpayers' filing behaviour and previous assessments is required (G,J,K). Much of this data already existed within the NRA – but only on paper, or scattered through a variety of digital spreadsheets, many of which had never undergone quality checks (G,J,K). Collecting, assessing and cleaning all of this data is a lengthy task, requiring a lot of dedicated manpower. Given the available time and resources, having it ready within the allotted timeline proved impossible (G,J,K). Therefore, while all management modules had been installed, it would take at least a couple of years before enough data become available within the system to actually make these modules useful (J,K).

Another issue which had to be dealt with within a tight timeline was staff resistance, arising from the fact that the move away from manual recording impacted both their daily work practices and their power to alter taxpayers' records (F,G,J,K). Previous experience with other ICT systems made the NRA aware of the importance of involving operational staff from the start of the project (G,J). As a consequence, change management was made part of the reform plan from the beginning (G,I,J), and change champions were identified across all operational units (G,J). Nevertheless, it was inevitable for some staff to fear the new reform (K,J) – either because they thought that their job would become redundant, or because they stood to lose the power to manipulate information (J). However, the vast majority of management, and especially the office of the Commissioner General, was strongly behind the reform. This, coupled with extensive reskilling and reassurance that no jobs were on the line, greatly helped to tackle pockets of resistance (F,G,J). It must also be noted that there were staff who simply doubted that any actual change would really take place, and who were only convinced of the NRA intention of implementing this reform when manual filing and the use of the legacy systems were suspended, and entirely ceased after the equivalent ITAS modules came online (K).

The decision to discontinue legacy systems during ITAS implementation was seen as necessary to ensure that everyone would come to terms with the new reality brought about by the reform (K). However, this also led to a couple of issues (F,J,K). First, not all taxpayers had obtained a new-ITAS compliant TIN when legacy systems and manual filing were suspended. Consequentially, filing simply became impossible for some of them (J). While this issue was easy to resolve – and forced taxpayers to update their details – the decision still led to complications, and taught the NRA that change management also has to be

directed towards taxpayers (J,K). Second, when the legacy systems were suspended only a few banks had interfaced with ITAS – the payment module was not yet fully operational (F), which led to delays in collection. Finally, historical taxpayer data only exists in the legacy systems, which makes them somehow complementary to ITAS (F,G). This implies that NRA staff will still have to rely on them for some time, at least until all relevant legacy data has migrated to ITAS.

As previously mentioned, a series of other ICT reforms were implemented alongside ITAS. While there was potential for clear synergies in introducing multiple ICT technologies at once, planning for their interaction was not always optimal (I,K), and this led to some problems during implementation. To give an example, issues emerged with differing registration requirements across systems – those for ITAS were much more stringent than those for other systems, such as ASYCUDA World (J). Consequently, taxpayers registered with the latter faced delays in clearing their imports when they had not yet updated their TINs to be ITAS-compliant, as they could not file some of the required documentation (J). However, the fact that all these reforms took place simultaneously meant that these issues could be dealt with concomitantly during implementation (F,J), hence minimising overall disruption time in the medium run. Leveraging synergies across implementation of multiple systems also had other positive consequences, such as ensuring that all data from electronic cash registers was immediately available through ITAS (F), or managing to implement in two to three years what would have otherwise taken four or five years (G).

Nevertheless, the overall judgment about moving on so many reforms at once seems to be negative, due to many reasons (G,I,K). First, it required more human resources than was foreseen during the inception of projects (I,K), which meant that planning and execution were at time suboptimal – leading, for example, to a lack of stakeholder consultation (I,K). Second, it was hard to keep staff motivated. Too many significant changes were taking place at once, and little incentive could be provided for the extra work required – this often involved the same people spread across multiple projects (G,K). However, since integration of the different systems was an important component of the reforms in the near future, simultaneously implementing the reform projects had the advantage of ensuring that any system designed was done with provisions for future integration.

3.2.3 Initial impact of ITAS introduction and lessons learned

Despite these issues, ITAS, as well as all other above-mentioned reforms, had been implemented by September 2021. Although it is generally recognised that it will take some time before the full impact of ITAS can really be appreciated (G,H,J,K), some positive and negative effects have already been noticed. Amongst the former, it is now much easier to recover taxpayer information and track their compliance (F,G,H,K), and taxpayers who learnt how to interact with ITAS are facing lower compliance costs, although many might need to be trained in it (H,J). Amongst the latter, the issues encountered came from registration of taxpayers, the operationalisation of the payment module, and the integration of banks with ITAS contributing to a slight decrease in revenue collection over the implementation period (J). While this was to an extent foreseen, it still contributed to putting the NRA under pressure, as some members of government expected benefits to materialise instantly (J). Nevertheless, most interviewees remained positive that any remaining technical issues could be solved in a reasonable time, as the NRA has a two-year support agreement with the suppliers, who have been so far very responsive (G,I,J,K). What will take longer is to continue training within the NRA, to collect enough data for management modules to be really used, and to continue upgrading the country's ICT infrastructure, all of which will be necessary to maximise the gains from the system (F,G,H,J). The capacity of ICT staff to continue operating the system independent of the suppliers is another important

consideration for sustainability of the ITAS. There still remains high dependence on the suppliers for any system configuration and modification, whether minor or major. Given how new the ITAS is, no upgrade has been planned at the moment – making it fully operational and getting used to its new functionalities are seen as the necessary first step (F,G,J). Furthermore, the NRA is a first mover when it comes to digital transformation in Sierra Leone, so the focus will now need to move to automating the processes of other ministries, departments and agencies, many of which might eventually be integrated with ITAS (I,H).

One of the most important lessons learnt through this experience was the complexity of matching donor funding cycles with implementation timelines for complex projects. The financing agreement signed in 2017 was for less than three years, well below what most interviewees thought necessary to implement a system like this ('a minimum of five years', K). This meant that the NRA was under enormous pressure through the whole process (I,H,J,K). There were a few instances in which some of the interviewees had the impression that the focus of the donors was not on ensuring a successful implementation (I,J,K), but rather on running down project funds within the agreed timeline (K). Something else that became apparent in hindsight is how important it was to have study tours before starting ITAS implementation (H,I,K). These missions could have informed all the implementation stages – which stakeholders to contact from the beginning, what types of challenges might arise, what type of solutions could be available – including discussions with donors about the required timeline (H,I,F).

4 Comparative analysis

As seen in the previous sub-sections, it is possible to draw many parallels and a few juxtapositions between the experience of Uganda and Sierra Leone with their ITAS implementation. Both of these will be explored in this section, and we also make reference to similarities with other examples present in the literature.

First, it is easy to see that the reasons for introducing an ITAS were almost identical in both countries, even though the initial plans were made more than ten years apart. Both the URA and NRA considered the number of manual processes existing in their domestic tax departments problematic, wanted access to better data for policymaking, saw the potential of automation after successful reforms at customs, and first identified ITAS as a solution close to the introduction of VAT/GST. However, in both cases there was a substantial time gap between when ITAS was first considered and when implementation was actually pursued, although the reasons for the delay differed – management support in Uganda, availability of funding in Sierra Leone. Another similarity is the recognition that, for any ICT solution to be successful, there needs to be a feeling of ownership among operational staff. This was immediately evident in the case of Uganda, as ITAS introduction was not pursued when the funds first became available as management saw no benefit in it. In Sierra Leone the realisation came with the development of the gap-filling system, which centred excessively on opinions from the ICT department.

At a first glance, one could think that donors played a similar role in spurring ITAS implementation in the two countries, as in both cases the first mention of its potential role was made by a supporting agency that funded business process re-engineering studies. However, these looked very different in the two countries. In Uganda it included various study tours, which were absent in the case of Sierra Leone. This difference proved extremely important. The experience gained by the Ugandan team through the study tours proved important in shaping their thinking about different technological options, and probably helped

them to drive the process with more autonomy from donors' suggestions. The lack of study tours was explicitly mentioned by different NRA stakeholders as having a negative impact on their initial preparedness. This put them in a worse position to argue with funders about different potential set-ups, and the feasibility of the proposed timeline and funding plan.

While both organisations recognised from the beginning that, to be effective, the introduction of ITAS had to be part of a wider reform process, including a significant change management component, their ability to drastically change their business model differed. However, this was mostly due to the time at which the reform took place. In the Ugandan case it coincided with a much wider reorganisation of the administrative structure of the URA – similar to the experience of adopting ITAS in Mozambique described by Blume and Bott (2015). In Sierra Leone, ITAS implementation did not coincide with a similarly overarching reorganisation of revenue collection, and therefore its impact on the overall approach to tax administration was more limited.

The fact that ITAS sat more organically within a wider reform process in Uganda than in Sierra Leone could also have had an impact on the amount of stakeholder consultation that was held in the two countries. Both authorities recognised the necessity of managing staff expectations from the beginning. The process appears to have been more confrontational in Uganda, where it led to some staff redundancy. This could be linked to the fact that one of the initial obstacles to reform in the country was opposition on the part of management, so implementation was only seriously considered after changes happened at that level. No mention of this level of resistance was made in the case of Sierra Leone, although the change brought about by ITAS was not welcomed by everyone there either. Nevertheless, both countries dedicated more attention to this facet of implementation than other authorities in the past (see the cases of Perú and Senegal in Blume and Bott 2015), with a positive overall impact.

Both similarities and differences can also be seen in how training was approached. Both countries had a substantial training programme in place from inception, and in both cases the importance of vendors' training of IT staff was stressed. However, there is one difference between the consequences of staff training in the two countries – the risk of the best staff being poached. This was explicitly mentioned in Uganda as something that had to be tackled, with the identification of a core team who were offered higher remuneration in exchange for a prolonged period of bound employment. This did not seem to be an issue in Sierra Leone, where the best staff seem to have been (over-)working on multiple projects at the same time. Another difference between the two countries is that in Uganda the vendor took part in the training of taxpayers from very early on, so many of them knew the system before it went live. This process had no real equivalent in Sierra Leone, where discussion about training for the wider taxpaying population only started when the system was going live, mostly because of pressure from donor partners to complete the project within the stipulated project closure date.

Another analogy between the two countries is that in both cases the initially defined timeline for ITAS implementation fell well short of what was actually required – both authorities could only go through definition of system requirements and procurement by the initial deadline. One of the interviewees suggested that this should be the approach to follow for this type of project – first, define a timeline to get to the end of procurement, then define an implementation timeline with the supplier who won the bid. This is because only the vendor will really know the time required by its own supply chain and team to develop custom functionality, and for the authority ICT department to be trained in the system. Different interviewees also mentioned that timelines should aim to disrupt the normal process of tax administration as little as possible, taking into account end of financial year and filing

deadlines. Regardless of this general consideration, the impact of not allowing for enough implementation time was markedly different between the two countries. In Uganda, having to speed up implementation led to a decrease in the customisation of some ITAS modules. In Sierra Leone the NRA had to scrap the pilot phase altogether, and will need to wait until enough historical data is accumulated within the system before operationalising the management modules.

The final similarity about the general approach to planning for ITAS implementation is the condition of the general ICT infrastructure. Both countries considered the quality of their hardware at the beginning of the adoption process inadequate and in need of an overhaul to really exploit their ITAS' potentiality. More data requires more processing power, but acquiring new hardware can also be a long and costly process – especially if it is decided that the system's vendor should provide it. However, upgrading ICT infrastructure is also important to face new security threats, as introducing an ITAS is likely to lead to increased risks of cyber-attack. General system-wide failure will also impact the authority's activities much more, so plans for disaster recovery also needed to be put in place in both countries, which often suffer from electric and internet grid failure. Planning for this aspect is important – disregarding the impact of different quality in infrastructure across the country might lead to issues with system use, as described by Blume and Bott (2015) for Senegal.

Where the two experiences clearly differ is in the procurement phase. This followed two completely different processes – two stages in Uganda, and a single stage in Sierra Leone. While issues were encountered in both, those in Sierra Leone were definitely more serious, as the first attempt to secure a system was deemed to lead to a possible mis-procurement. However, the two different experiences seem to be connected more with the availability of support than the process itself, as the URA received technical assistance from a procurement specialist from the beginning, while Sierra Leone did not. However, in the opinion of our interviewees, going through a two-stage procurement process played an important role in securing a system up to the desired specification. This is because, by having a first phase in which each bidder was asked to declare what more than the minimum specification they could offer, the URA could select a group of vendors who had a genuine understanding of the context of an LIC. As only these vendors then received the full bidding documentation, the conversation in the second stage could focus on important details rather than remain generic, as well as offering the chance for more study visits. This was an unusual procurement process even at the time, but it was still allowed under World Bank-funded projects – a situation that had changed by the time the NRA started their procurement. Regardless of the actual process faced, both countries' teams found procuring ITAS to be more complex and lengthier than other types of technology, echoing the consideration made in Perú and Senegal by Blume and Bott (2015) – although their study also presents a different experience from eSwatini.

With regard to implementation proper, in addition to the above-mentioned consideration on recognising an appropriate timeline, there were both similarities and differences. Amongst the former, the first thing to mention is that both countries had a very limited capacity to migrate pre-existing data from legacy systems due to its generally poor quality. In both cases, this implied that the analysis module remained – or will remain – largely unused for years, hence leading to the question if they should have been prioritised for initial procurement, or if that budget could have been better spent elsewhere. Another similarity is having to coordinate the implementation of the registration module with the need of importers to ensure continued functionality of ASYCUDA. In both cases, new TINs were generated when ITAS was introduced, and while they were developed with the need of domestic tax departments in mind, this process can greatly affect the work of customs. The process of quickly issuing new TINs so not to impede imports went relatively smoothly for large

taxpayers in both countries, but in both took much longer and proved more complex when small taxpayers had to be brought on board.

Similar experiences were also encountered with integration with the banking sector, which also proved more complex than anticipated. In both countries, the decision was to wait until resisting banks came around, as resistance led them to lose business with clients who could not comply with their tax obligations. However, this approach clearly had an impact on collection levels during implementation. This is where the experience of the two countries start to differ, as the impact on collection was greater in Sierra Leone than in Uganda. The former went live with the system for all taxpayers, and the latter only for those of the pilot office, for which a shortfall in collection was foreseen. Not piloting the system is also behind other differences with the implementation experience, especially with regard to discontinuation of legacy systems during roll-out. In Uganda, legacy systems were used across the URA as ITAS was being tested in the pilot office; this was the only one cut off from them. This ensured that the system was functional before its country-wide roll-out, and Authority-wide training ensured that staff were ready for it when that happened. In Sierra Leone, the decision to discontinue legacy systems had to be taken authority-wide once enough ITAS modules were up and running, to ensure that staff actually started using the new one. Due to the different roll-out strategy in Uganda, large taxpayers and tax agents seem to have played a bigger role in promoting ITAS use amongst taxpayers than in Sierra Leone.

Few comparative considerations can be made regarding the post-implementation experience and ITAS impact, as by the time of this study's publication the system will only have been in place for a few months in Sierra Leone. Something can be said about how adopting ITAS led the URA to take over some collection duties from other government agencies, which had to be integrated within the system – a long and contentious process. While the NRA already collects most non-tax revenue in Sierra Leone, there is an awareness that integrating other government agencies into ITAS will lead to improved functionality, and in fact 13 government institutions have been identified as requiring ITAS access. Different experience with the management of upgrades is also likely to arise. In Uganda, it was soon felt that not buying rights to the source code was not the best choice, as this led to recurring expenses for upgrades and system patches. This worry has not yet materialised in Sierra Leone, both because it is too soon to think about upgrading the system, and because the implementation contract bounds the supplier to provide assistance for two years. Even at this early stage, it is evident that a similar issue will be faced in Sierra Leone, as reconfiguration of the ITAS following the recent redenomination of the country's national currency in June-July 2022 required the NRA to pay the vendors additional amounts in the context of a change request.

It is also useful to make a general reflection on how these case studies relate to wider discussion on technology adoption in the literature. If we consider how close the reasons for deciding to adopt an ITAS were in both organisations, and especially the connection made with the 'modernising' mission of semi-autonomous revenue authorities, it is easy to imagine that institutional mimicry might have played some role, as per Karch (2014). This is in itself not that surprising. There are now many fora in which tax administrators from the African continent interact with each other, and donors offering assistance to revenue authorities will probably tend to suggest similar solutions in different countries – which in itself stresses their role (Blume and Bott 2015). In both cases, the adoption of ITAS also represented one of the first e-government reforms actually allowing citizens to perform transactions electronically, so a step ahead of simply providing information. Similarly, in both Uganda and Sierra Leone the introduction of ITAS also led to discussions about offering additional services, such as creating phone applications for taxpayers to manage their liabilities on the go. These discussions demonstrate how the introduction of ITAS represented a step towards the middle

section of the 'progressive stages' of e-government services (Baum and Di Maio 2000; Hiller and Belanger 2001; Layne and Lee 2001; Ronaghan 2002; Wescott 2001). The following stage in that path is integration across different government services, and there are indications that introducing ITAS has led the governments of both countries to think about how to consolidate the collection function between different agencies, integrating them into the same system. Although this does not exactly match the integration of all public sector systems in a unified framework, as described by Ebrahim and Irani (2005), it probably is a necessary step in that journey. It is also worth noting that both institutions seemed more aware of the need to change their business processes and service delivery mechanisms than might have been expected given the penetration of e-government in the two countries (Lam 2005, van Veenstra et al. 2011).

Finally, it is also easy to see how most of the obstacles to technology adoption identified in the literature were also encountered in our two case studies, although they were not all equally significant. Issues with the existing IT and power infrastructure were common in both, and substantial investment had to be made in staff computer skills (Ebrahim and Irani 2005). While some organisational resistance was also encountered, especially in the early stages of reform planning in Uganda, they did not derail reform efforts – differently to other instances (such as that described in Bwalya 2009). This is because both organisations had developed dedicated change management strategies, and they did not involve all types of organisational barrier identified by Nurdin et al. (2011). Specifically, the reform mission was extremely clear for both organisations, and most, if not all, of the relevant stakeholders were consulted. The issue was probably an initial lack of adaptability by staff, who were used to a particular work structure and the opportunity for personal enrichment it offered.

5 Conclusion and policy recommendations

The adoption of different types of ICT in public organisations has long been hailed due to its potential to streamline administrative practices and improve service delivery, with gains for both citizens and state coffers. This has also been true for revenue administration, for which ICTs' potential impacts range from increased data availability and quality for tax officers and policymakers, to reduced compliance costs for taxpayers. However, despite great initial hopes, the adoption of ICT solutions has often failed to lead to the promised results, as reforms are lengthy and complex to manage, and as a consequence easy to derail. While there are studies focusing on the determinants of – and obstacles to – ICT diffusion and adoption by different public bodies, including some tax administrations, most of them cover the experience of high-income countries.

To contribute to filling this gap, our study offers an in-depth analysis of the introduction of an ITAS by the URA and the NRA, which adopted this ICT solution more than ten years apart. The different processes and plans of both organisations are illustrated through four different stages of reform – its initial conceptualisation and planning, the procurement of the technology, its deployment during the implementation stage, and its impact. The lessons learnt by the two authorities should be of interest to other tax administrations that might be considering implementing similar systems, which respond to the need to adopt modern approaches to tax collection engrained in the mission of revenue authorities.

Through the parallels and differences across these two experiences, the study shows that there are some key aspects that need to be taken into account when a reform as overarching as ITAS implementation is considered. First, during the conceptualisation stage it is important to consult as many internal stakeholders as possible, as the changes in business

practice brought about by an ITAS will invariably be much wider than the domestic tax department. The wider the internal consultation, the stronger the feeling of ownership of the change to come, which will nonetheless require extensive management strategies to be successfully tackled. However, the temptation to overvalue the opinion of the ICT department should also be resisted – while they are likely to be one group of employees with a stronger point of view on what should happen, they only represent a fraction of the final users, and arguably not the most significant.

During this stage, it is also important to conduct different study tours – while these are expensive, they greatly help to understand the technologies available, as well as their cost and the implementation time required. This can prove crucial in constructing an informed and internally owned position on what type of technology, procurement strategy and deployment approach will be best suited to each country's particular situation and available resources. Given that the latter are likely to be in significant part arising from donor funding, the capacity of the revenue authority to argue for potential changes in the initially proposed plan might prove crucial in ensuring a smooth deployment down the line.

Particular consideration should be directed at how much time is allocated to the different phases of project implementation, as an excessively short timeline – or one that does not fully recognise that different obstacles might arise at different stages – will have a significant impact on the outcome. There might be good reasons to consider two different timelines – one to arrive at the end of procurement, and one to actually implement the system with the vendor. Although this strategy might have to be extensively discussed with donors – if they are involved – it will also protect the implementing agency against delays that might arise from external actors during procurement. The procurement process itself will probably be lengthier and more complex than most others undertaken by the authority, in which case it will be relevant to have support available from procurement specialists.

Regarding the implementation phase, it seems advisable to plan for a pilot phase. This has many benefits, from managing the impact of lower collection to easier final roll-out. It will also be important to give appropriate consideration to which offices should be used to test the new systems, as disruptions in business have to be expected at different stages. While often the LTO is selected as the pilot office, it might be better to preserve the capacity to collect revenue from the most important taxpayers in the country during an implementation phase whose length cannot be known with certainty.

The potential consequences of facing difficulties during the integration of the ITAS with existing technologies should also be given appropriate consideration. During the implementation of the registration module, particular attention should be directed towards the integration of the new TINs with those in use at customs – import-export clearance occurs daily, and even short disruptions can have a major impact. During the implementation of filing and payment modules, issues in system stability and integration with the banking payment infrastructure are likely to arise. This will impact collection levels, something that should be accounted for from the beginning to reduce backlashes. Managerial and analysis modules are more likely to be implemented smoothly, but might take much longer to become useful. This is because historical data is often of too poor quality or too disorganised to be migrated, so there is a chance that it might not be included in the system. While this could be avoided to some extent by dedicating significant human and financial resources to its cleaning prior to implementation, when this is not possible it might be worth considering implementing these modules at a later stage.

Finally, the importance of focusing on staff training and managing expectations cannot be overstated. For the former, it is vital to ensure that staff from the IT department receive as

much training as possible from the vendor, as this will probably be a one-off occasion for skills upgrading, and they will eventually be those keeping guard over it. However, equal attention should be dedicated to the training of operational staff, as they are the ones who will determine the final impact of the reform through their acceptance of the system. The latter will not only depend on their technical skills, but also on management of their expectations of change of daily work practices, including their loss of power vis-à-vis the taxpayer and other departments within the authority. It could at times become unavoidable to lose staff in the process. In this situation, effort should be directed at keeping staff whose profile has improved during the reform process, and letting go those who cannot accept the changes brought about by the system.

Appendices

Appendix 1 Interview guidelines

Section 1 – Planning of Integrated Tax Administration System introduction and selection of specifics

1. When you first thought of planning the introduction of an ITAS, how did the idea come up? (ELABORATE IF GENERAL ANSWER OR CONFUSION: *Was it promoted by someone in the senior management team, was the process suggested by one or more middle-managers, was it prompted through donors' suggestion and by the availability of dedicated funds, was it prompted through a diagnostic assessment of RA situation analysis, or was it part of a broader modernisation effort by the whole public administration, hence coming from government?*)
 - a. FOLLOW-UP 1 [if senior management gets mentioned]: How did the other departmental heads react to the idea? (*were they all on-board, did someone express perplexity, what were these perplexities, how long were they discussed if at all*)
 - b. FOLLOW-UP 2 [if middle managers mentioned]: How did they then participate in the following reform process?
 - c. FOLLOW-UP 3 [if donors mentioned]: Could you tell me more about how the donor or donors approached you? (*was it one or more, did they have a proposal or just an idea, was it during a wider meeting or a dedicated one*)
 - d. FOLLOW-UP 4 [if PA modernisation]: Can you elaborate on the wider modernisation strategy: who promoted it, which were the objectives, which institutions were involved, how strongly were they co-ordinated?
2. What was your experience with the legacy system and what were the reasons for deciding to embark on ITAS introduction?
 - a. FOLLOW-UP 1 [if limitations of previous system gets mentioned]: what were these limitations, and how were they identified?
 - i. FOLLOW-UP 1.a [if no clear mention of identification]: What type of assessment was conducted to identify the limitations? (*were they perceived to be widespread by many members of the authority, were they identified by a dedicated study of your previous IT system and of what needs a new one should satisfy, or through dedicated meetings*)
3. Were other internal reforms identified as necessary to maximise ITAS impact at the planning stage?
 - a. FOLLOW-UP 1 [if yes and not mentioned which one]: Which ones? Can you tell me about their identification process? (*staff re-skilling, creation of new units within particular departments, new strategies for data use; for identification process looking for who promoted them, if there was discussion amongst different departments, etc.*)
 - b. FOLLOW-UP 2 [if no and no mention about later stages]: Were other reforms identified during the implementation stage, and if so, which ones and how?
4. How many different types of technologies were initially considered as candidate? (*commercial off-the-shelf vs. specifically produced, local vs. international, owned vs. rented*)
 - a. FOLLOW-UP 1 [if more than one]: How did you decide which one was suiting your needs better? (*talking with other RAs which implemented it, talking with producers, feasibility study*)
 - b. FOLLOW-UP 2 [if only one]: what made you decide that this was the best solution? (*talking with other RAs which implemented it, talking with producers, feasibility study*)

5. Did you contact any technology provider ahead of the procurement process?
 - a. FOLLOW UP 1 [if yes]: How many? Can you tell me about these contacts? *(Asked information about products and price, demonstration, was it alone or in conjunction with partners/other potential clients etc.)*
6. Were you planning the introduction of other ICT reforms in concurrence with ITAS implementation? *(ECRs, e-filing, e-payment, RA mobile app)*
 - a. FOLLOW-UP 1 [if yes]: How did you approach this multiple implementation? *(thought about them separately, planned for joint implementation and interface from the get go, shared members across teams)*
 - b. FOLLOW-UP 2 [if yes]: How do you think that planning multiple project impacted implementation and procurement? *(positively as there were synergies/economies of scale, negatively as we had to spread resources across multiple projects)*

Section 2 – Procurement

1. What type of tender was used for the procurement of the ITAS? *(open – everyone can apply, selective – a given number of producers are invited, negotiated – one supplier identified and negotiation follows)*
 - a. FOLLOW-UP 1: was this the normal tender procedure for public procurement?
 - b. FOLLOW-UP 1a [if yes to the above]: Was any other procedure considered?
 - c. FOLLOW-UP 2 [if no to FU1]: what led you to follow a different procedure?
 - d. FOLLOW-UP 2a [if yes to FU1a]: can you tell me about the different procedure considered and why it was not adopted?
2. Was any issue encountered during the procurement stage? If so, which ones? *(e.g. lengthy coordination amongst different government agencies and/or donors, withdrawal of political or donor support, inflating of costs, claims of misprocurement, suspicion of influence – from within out outside the RA, or influence from the bidders)*
 - a. FOLLOW UP 1 [if yes]: What impact did they have on the project outcome, if any? *(increased timing impacting other reforms, created tension with supplier and/or other government agencies, increased cost of the project)*

Section 3 – Implementation

1. How did you decide how long was the process of implementation going to last?
 - a. FOLLOW-UP 1: Did this prove to be enough time or did you have to lengthen it?
 - b. FOLLOW-UP 2 [if had to lengthen]: How did the increased amount of time impact the project? *(made it more expensive, complicated or simplified coordination with other reforms)*
2. Did you pilot specific components of the system and required feedback from the users?
 - a. FOLLOW-UP 1 [if yes and not elaborated]: what type of feedback did you require? How was this feedback collected? How did you incorporate it? Did it significantly impact the implementation time and cost?
3. Were the newly introduced system and the legacy system used contemporaneously during the implementation period?
 - a. FOLLOW UP 1 [if yes]: What did you learn from the experience of having both systems operating at once? *(led to issues, clearly revealed improvements from new system, led to request of additional functionality)*

- b. FOLLOW UP 2 [if no]: How was the initial experience of moving directly to the new system? (*proceeded swiftly, created some minor issues, created some major issues*)
 - i. FOLLOW UP 2.a [if issues to FOLLOW UP 2 and no to piloting/feedback question]: in hindsight, do you think that these issues could have been foreseen by requesting feedback from the technology users?
4. What was the general staff attitude towards the new technology during the implementation process? (*curious, exited, worried, resisting*)
 - a. PROBE 1 [If only positive feeling reported]: we know from other case studies that some staff is usually worried about the impact of new technologies on their work responsibility. Why do you think this was not the case here?
 - b. FOLLOW UP 1 [if worried, resisting or other negative feeling]: How did you manage these reactions, and do you feel that they hindered project implementation?
5. [If some accompanying reforms were identified in Section 1] How did the implementation of accompanying reforms go during ITAS implementation stage? (*smoothly, more or less as planned, delayed, suspended*)
 - a. PROBE 1 [If no challenge at all is reported]: We know from other case studies that internal reform often encounter challenges in their implementation. Why do you think this was not the case here?
 - b. FOLLOW-UP 1 [if not implemented or delayed]: what happened? How did that delay/not implementation impact the ITAS implementation process?
 - c. FOLLOW-UP 2 [if smoothly or more or less as planned]: Do you think they impacted the ITAS implementation process? (*do you feel that they helped making the ITAS implementation process smooth?*)
6. [If other technologies implemented alongside ITAS] How was the experience of introducing multiple technologies at the same time? (*it went as planned, there were strong synergies, it proved complex*)
 - a. PROBE 1 [If no challenge at all is reported]: We know from other case studies that multiple concurrent implementations often incur in some risks. Why do you think this was not the case here?
 - b. PROBE 1: do you feel it would have been easier to sequence the introduction, or that moving contemporaneously lead to creating particular synergies?
 - c. FOLLOW UP 1 [if not as planned]: what happened? Did it impact the implementation of either technology? How?

Section 4 – Acceptance/Upgrade

- 1. How do you feel that the new system contributed to the work within the RA?
 - a. FOLLOW UP 1 [if not much or negative opinion]: why? (particular issues were unforeseen, other reforms should have been implemented alongside)
- 2. Do you feel that the new system is posing challenges, either foreseen or unforeseen?
 - a. FOLLOW UP 1 [if yes]: which one? How are you planning to solve them?
- 3. Are there plan to review system performance at regular intervals, and/or to introduce new modules in the future?
 - a. FOLLOW UP 1 [If yes to either]: Have you carried out one already? Can you tell me more about it them if so?

Appendix 2 Details of the interviews

Uganda case study

Ms Rachael Magoba, Uganda Revenue Authority Manager for Systems and Processes, online interview held in September 2021

Mr. Henry Saka, former member of the Uganda Revenue Authority and ITAS Project Team, Uganda Revenue Authority, online interview held in September 2021

Mr. William Kiganda, former member of Uganda Revenue Authority and ITAS Project Team, online interview held in September 2021

Mr. James Kizza, former member of Uganda Revenue Authority and ITAS Project Team, online interview held in September 2021

Mr. Nikunj Mungara, Project Manager for the Vendor, online interview held in September 2021

Mr. Sam Nakabaale, former Assistant Commissioner for Information Technology at the Uganda Revenue Authority at the time of the ITAS Implementation, online interview held in September 2021

Sierra Leone case study

Dr. Philip Kargbo, Director of the Monitoring, Research and Planning Department, Sierra Leone National Revenue Authority, in person interview held in November 2021

Alhaji Salia Konneh, Assistant Commissioner of the Domestic Tax Department and former ITAS Project Manager, Sierra Leone National Revenue Authority, in person interview held in November 2021

Samuel Fullah, ITAS Project Manager, Sierra Leone Revenue Authority, online interview held in December 2021

Gerald H. Ganda, Director of the Information and Communication Technology Department, Sierra Leone National Revenue Authority, in person interview held in November 2021

Matthew Dingie, Principal Deputy Financial Secretary and highest-ranking official in the Ministry of Finance overseeing ITAS implementation, Ministry of Finance of Sierra Leone, in person interview held in November 2021

Adams Tommy, Senior Economist and PFMICP Project Manager, Ministry of Finance of Sierra Leone, online interview held in December 2021

Mr. Sam Nakabaale, Project Manager for the Vendor, online interview held in September 2021

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