Creating an Electronic Tax Administration System in Zambia

PROJECT DATA

PARTNER ORGANIZATION:
Global Delivery Initiative

DEVELOPMENT CHALLENGES:
Increasing the efficiency and effectiveness of tax administration to improve revenue collection

DELIVERY CHALLENGES:
Time Allocation; Opposition or Lack of Consensus; Information and Communication Technology

SECTOR:
Tax

COUNTRY:
Zambia

REGION:
Africa

PROJECT DURATION:
2012–2014

PROJECT COST:
US$8,786,550

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In Brief

- **Development Challenge:** The primary purpose of TaxOnline was to increase the efficiency and effectiveness of tax administration in Zambia and thereby improve revenue collection. An electronic tax administration system would make filing tax returns and paying taxes a less cumbersome process and eliminate the need to physically visit a revenue authority office. These improvements could increase taxpayer compliance. The new system could provide better data to allow tax officials to identify taxpayers or potential taxpayers who were skirting their tax obligations by withholding information from the ZRA.

- **Project Solution:** The Zambian Revenue Authority contracted with a private firm to purchase an electronic tax administration system. In 2012, the authority created a project team to oversee implementation. The team identified the features and functions needed in the system through consultations with revenue authority staff and created blueprints to guide the work of the private firm, which developed the system. The team arranged for staff to test parts of the system as it was rolled out, trained staff on how to use the system, and educated taxpayers on the coming changes. After the system went live, the team arranged for continued assistance and education to taxpayers.

- **Project Results:** In less than one and a half years, in October 2013, the TaxOnline project team delivered an electronic tax administration system. Instead of processing registrations, returns, and payments manually and using paper forms, users could carry out their tax activities online. The usage of TaxOnline's electronic services steadily grew over time. In 2017, a total of 1,987,675 or 98 percent of the returns were filed electronically while only 49,977 or 2 percent of the returns were filed manually. By 2019, over 90

percent of registrations were processed electronically and around 70 percent of payments were submitted to ZRA electronically. The time it took for filing, payment, and processing of tax returns dropped from averaging between 10 to 16 days before the system launched to within one day in 2014. The system strengthened taxpayer compliance and provided a wealth of data for the revenue authority.

Executive Summary

In 2012, the Zambian Revenue Authority (ZRA) put together a project team to guide the development and delivery of a new electronic tax administration system, called TaxOnline, to replace an inefficient, fragmented system that had tax registrations, returns, and payments modules for only three tax types while the rest were manually administered, using paper forms. The revenue authority had contracted with Tata Consultancy Services, a private vendor, to develop a software system, which adapted an e-tax model built for Uganda to the Zambian system. The project team was responsible for creating blueprints to guide the developers' work, testing the system, training internal staff and educating taxpayers, and encouraging people to embrace the new system. The team worked with internal stakeholders and the private vendor to develop various modules within the system and ensure that each delivered the desired outputs. The ZRA developed a strategy for dealing with the difficult problem of migrating data from the old systems to the new database, choosing not to migrate certain information. The team conducted training, sensitization, and education campaigns to prepare revenue authority staff and taxpayers for the new system. The team worked against a tight deadline to deliver the first phase of the project in October 2013, but many taxpayers did not understand the system and had trouble using it, leading to an influx of visits and calls. The ZRA took measures to manage taxpayer issues while the team continued to develop additional modules and interfaces with other government agencies. Further modules went live in May 2014, but the ZRA had to negotiate for several years to get all the country's commercial banks to interface with TaxOnline so that their clients could make payments electronically. Several years into implementation, the vast majority of tax returns and registrations were filed through TaxOnline and the revenue authority was able to operate more efficiently, get tax money to the central government more quickly, and increase taxpayer compliance, among other benefits.

Introduction

The Zambia Revenue Authority (ZRA), established in 1994, had been an important tool for improving tax collection in Zambia since its creation, but by the late 2000s some shortcomings were evident in the country's revenue administration. Paying taxes in Zambia was time consuming and costly for both taxpayers and tax officials. Outdated operating procedures required taxpayers to physically go to revenue authority offices to file and pay their taxes, which often meant long waits in line, and for some Zambians required long journeys to the nearest ZRA office.

Officers at the revenue authority used a fragmented and ineffective tax administration system. They had to refer to several different sources, including hand-written records, in order to determine a taxpayer's tax liability and what he or she owed or had paid to the revenue authority. Data on different tax types – including income tax, value-added tax, corporate tax, turnover tax, and mineral royalty tax – were spread across these different systems, and it was difficult or impossible to pull out data useful to administrators and policymakers. "When you are compiling a tax position you need to collect from a common database" to ensure quality and accuracy, said Claydon Kalambo, a senior tax inspector who worked as the ZRA's manager of arrears and compliance.[1] But the revenue authority lacked a single authoritative database, which increased the risk of error.

Manually processing tax returns and other business was a burden on the system, especially in smaller ZRA offices that lacked data entry operators. "Somebody would submit a manual return and it would get thrown into a storeroom, then a taxpayer would perhaps be audited and would find that we didn't have that record on our system." The tax registration system faced similar problems. "We would have to send registration forms to Lusaka [Zambia's capital city], then pay somebody in Lusaka from our budget to do it over lunch, then they would send them back," said a former ZRA employee who had worked in a ZRA provincial office. "We always had a backlog."[2]

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1   Author interview with Claydon Kalambo, ZRA, February 11, 2019.
2   Author interview with a former ZRA employee, February 14, 2019.

In the late 2000s, ZRA leadership decided to pursue a new electronic tax administration system as part of a broader modernization program that had started in 2006. "We could not cope with doing things manually. We thought that with an electronic platform, certain services could be provided much more efficiently and faster", said Irene Mwila, who worked as a client services officer at the ZRA and led the registration module group as part of the TaxOnline project team.[3] A modern electronic tax administration system would have a number of advantages. There would be no need for manual procedures and long queues, information on all tax types could sit on one database, and data on taxpayers and transactions would be available in real time.

When the ZRA had previously built an integrated tax administration system from scratch, it had taken eight years. This time, ZRA officials wanted the process to move much faster. For this reason, the revenue authority decided to pursue an off-the-shelf system from a private vendor. In July 2012, after going through a procurement process, the ZRA awarded a contract to Tata Consultancy Services, the consulting arm of the large Indian conglomerate Tata Group. The company, known as TCS, had previously built an electronic tax administration system for Uganda, and also had a tax system contract with Kenya. ZRA decided to, in effect, purchase the system used in Uganda and work with TCS to customize it for the Zambian context. The system would be called TaxOnline.

The majority of the funding for the system came from the government of Zambia, but the Investment Climate Facility for Africa (ICF), a donor-funded development institution based in Tanzania, agreed to provide financial and technical assistance. After finalizing the deal with TCS in July 2012, the ZRA set an ambitious implementation goal: to launch the system by October 2013.

Development Challenge

The primary purpose of TaxOnline was to increase the efficiency and effectiveness of tax administration in Zambia to improve revenue collection. Zambia faced budget shortfalls that led the government to issue $3 billion in bonds from 2012 to 2015 (Economist Intelligence Unit, 2015). If Zambia was to maintain existing expenditure

levels in a sustainable manner, higher domestic revenue collection was essential (World Bank Group, 2016).

ZRA believed TaxOnline could improve revenue collection by increasing taxpayer compliance. In part, this would work by making it easier to pay tax, through shorter wait times, less cumbersome tax procedures, and eliminating the need to physically visit a ZRA office. "Zambia is quite a vast country, so you find that with tax offices in only a few designated places some people have to travel long distances and pay so much to file a return," said Florence Muleya, a former ZRA employee who researched tax issues at the Zambia Institute for Policy Analysis and Research. "Sometimes you'll find that these transport costs are much higher than the tax someone has to pay."[4] The better data the new system could provide would also make it easier for tax officials to identify taxpayers or potential taxpayers who were skirting their tax obligations by withholding information from the ZRA.

Delivery Challenges

Creating an electronic tax system could deliver a number of benefits to the Zambia government, but the ZRA would have to account for a limited time frame for project implementation, skepticism or resistance within the ZRA and among taxpayers, and poor access to computers and internet connections among many taxpayers.

Time Allocation

The first challenge to implementing the TaxOnline system was the limited time the ZRA had to customize a complex tax administration system for Zambia and get it in working order by the October 2013 deadline. The system that the ZRA purchased was off the shelf and had to be customized to meet Zambia's requirements. "Even though you had the basic framework for taxation… the nitty gritty is very different," said Yvonne Marion Mwanza, who would lead the TaxOnline implementation team. "There are certain things that we had to do, a lot of changes to the processes, forms, returns, etc." This required working closely with the developers to incorporate each detail into the system. Initially, the ZRA staff also lacked project management experience and required training. Several people brought

3 Author interview with Irene Mwila, ZRA, February 11, 2019.

4 Author interview with Florence Muleya, Zambia Institute for Policy Analysis and Research, February 12, 2019.

on to guide TaxOnline to completion had worked in various departments of the revenue authority but were unfamiliar with planning and delivering a project in a high-pressure environment.

Opposition or Lack of Consensus within the ZRA

Institutional resistance within the ZRA potentially stood in the way of project implementation. Transitioning to an electronic tax administration system put certain jobs within the revenue authority at risk. Chief among these were data entry officers, who would have a drastically reduced workload if taxpayers could input most of their information online, and employees working at ZRA's cash offices, whose work accepting payments in person would be obsolete if taxpayers transitioned to online payments. The ZRA had to manage these concerns.

Information and Communication Technology

Certain characteristics of the target population – essentially the entire population of Zambia and foreigners who paid taxes in the country – were another potential challenge to the effectiveness of TaxOnline. First, many Zambians had limited access to the internet, low computer literacy, and low tax literacy. The ZRA had to keep this in mind when designing and rolling out the system. "A major concern where I was based, which was in a somewhat rural province, was that the literacy levels were extremely low," said a former ZRA employee. "Our taxpayers, a lot of them could not even fill in the returns themselves, you had to fill it in with them."[5]

Opposition or Lack of Consensus among Taxpayers

Many taxpayers were comfortable with conducting their tax business manually, in person at ZRA offices. TaxOnline required a change in behavior that some might resist. Regardless of how user friendly or convenient the online system was, people had grown accustomed to bringing documents to the ZRA, having them accepted and stamped by a ZRA worker, and paying taxes in person. It would not be easy to change habits forged

over decades. Improved compliance measures could also result in some taxpayers paying more tax, which some might object to.

Contextual Conditions

Zambia, a lower middle-income country, is one of the most highly-urbanized countries in sub-Saharan Africa, with 44 percent of the population concentrated in a few urban areas along the major transport corridors, while rural areas are sparsely populated (World Bank Group, 2016). Zambia had been dependent on external aid in the past, but thanks to economic development, grants represented just 1.4 percent of revenue as of 2015 (World Bank Group, 2016).

Zambia's tax revenue declined from 30 percent of GDP in the 1970s to an average of only 13 percent of GDP in the 1990s. To address this decline, the country implemented tax reforms including the creation of the ZRA, which was established in 1994. The ZRA was tasked with tax collection, administration, compliance, and enforcement, while the finance ministry was responsible for formulating revenue policy (Mwila, Manley, Chileshe, Phiri, & Mpembamoto, 2011).

Zambia was hit hard by the 2009 economic crisis. These tough economic conditions, combined with domestic challenges, tight liquidity, and limited appetite for economic reform, contributed to a substantial buildup of spending arrears (unpaid bills such as late payment of road contractors) in the 2000s and pressure on the government's cash flow (World Bank Group, 2016). Double digit inflation and the rapid depreciation of the kwacha, Zambia's currency, raised prices for many domestic and imported goods. Zambia's Auditor General reported increasing levels of wasteful government expenditure, while public investment expenditure was scaled up without building the necessary systems for managing public investment effectively (World Bank Group, 2016).

Income taxes, consumption taxes, and trade taxes contributed up to 70 percent of the national budget. Consumption taxes included domestic value-added tax (VAT), import VAT, and excise duty, while trade taxes included customs duties and export duties. Under the ZRA, revenues increased as the economy grew from the early 2000s, and by 2013 domestic revenue reached 16.9 percent of GDP. (Nalishebo & Halwampa, 2014).

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5   Author interview with former ZRA employee, February 14, 2019.

Tracing the Implementation Process

To create and implement the TaxOnline system, the ZRA put together a project team, worked with the vendor to develop the system, migrated data from the old systems to TaxOnline, prepared ZRA staff and taxpayers for the coming change, dealt with taxpayer issues after the initial launch, developed further modules and interfaces for the system, engaged commercial banks to develop electronic payment capabilities, and created incentives for using the system.

Creating the Project Team

After the ZRA finalized the contract with the developer, the first step in implementation was putting together a project team responsible for determining the requirements for the system, creating a blueprint to send to the developer, and overseeing development until the system was delivered. Mwanza, who had worked for the ZRA since 2002, became the project team leader, tasked with seeing through the day-to-day work of the team. Her experience at the revenue authority included audit work and tax accounting and required thorough knowledge of the existing tax administration systems at ZRA. She reported to the project manager in the domestic taxes division. "It was the first time I was doing a project, so I was first of all overwhelmed in all that it entailed," Mwanza said.[6]

Other team members from various departments of the ZRA's domestic taxes division were assigned to work on different "modules," the name used to refer to different aspects of the TaxOnline project. The system had many modules including returns, refunds, tax registration, debt collection, audits, assessment, and payments. All in all, the project team comprised about 20 ZRA staff.

Because the team lacked experience in project management, ZRA provided training and certification in Prince2, a structured project management method. "We were trained in Prince2 so we could understand what it was we were going into," Mwanza said. "It was something new for most of the team members."[7] The team members in the ICT module received additional training in South Africa on the Java programming language and Oracle Weblogic administration. They also received information security training, and TCS provided further training in India.[8]

External partners also contributed to the development of the project team. The United States Department of the Treasury sent a team of consultants to support ZRA's reforms, including training and guidance in quality assurance and change management. The Investment Climate Facility for Africa also funded the hiring of a change management consultant.

Project Management and Coordination with the Vendor

The first step for the project team was identifying what specific functions and capabilities to include in the TaxOnline system. Team members working on each module studied Zambian tax laws and conducted a gap analysis to identify where the system TCS had implemented in Uganda differed from what the ZRA needed. The changes and new features required were many and varied. Examples included: how taxpayers were identified in the system, timeframes for debt collection, Zambia's different tax types, provisions for changing ownership of a motor vehicle, the type of tax return that different industries were able to file, and the turnover threshold below which a business paid only a flat tax.

After those fundamental changes were identified, the project team created detailed blueprints for each module. These were documents to guide the work of the developer. The teams took months to consult with different stakeholders about what they wanted in the blueprints.[9] For example, Claydon Kalambo, who led the debt collection, audit, and assessment modules, set up meetings with different operating units within the ZRA relevant to his modules, sometimes inviting TCS staff to ensure effective communication and move quickly toward making decisions. Once each blueprint was completed, the team presented it to a project management committee at ZRA for final approval. The blueprints then went to TCS for engineering.

TCS, the developer, performed the customization because the ZRA did not have the actual source code to the system.[10] TCS brought a team to Zambia to work on the

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6   Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
7   Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
8   Author interview with Christopher Kabamba, ZRA, February 12, 2019.
9   Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
10   "Source code" refers to a text listing of commands to be compiled or assembled into an executable computer program. The source code allows programmers to study and modify the program.

project, and also had an offshore team working in India. The actual development primarily took place offshore. "As they developed the system, they then delivered the patches to the onshore team here. The onshore team then worked with the ICT team to apply those patches," said Christopher Kabamba, an ICT technical project team member at the inception of the TaxOnline project who later became ICT technical lead on the project team.[11] The ICT team at the ZRA played a quality assurance role, oversaw migration of data to the new system, and handled infrastructure like setting up servers. TCS also sent design documents that the ZRA team could review to ensure they were consistent with the blueprints.

TCS sent each patch through a virtual private network link into a test environment, a version of the system that the ZRA could use to test its functionality and identify any problems before TaxOnline went live. The project team provided the first line of quality assurance for the system modules. After the team tested a module, it held a formal user acceptance test with various stakeholders at the ZRA who checked whether the system met their requirements. "We would call in staff from various departments and sometimes people from outer stations (ZRA offices in other parts of the country) to test the system," Mwanza said. "If something is not right, it would go back to the developers for them to correct."[12] Testing included inputting test data to test various scenarios and determine whether the system provided the proper outputs. Once the developers fixed any problems, the ZRA approved the module for deployment on the live server.

Given the tight timeframe for delivering TaxOnline, ZRA decided on a phased implementation approach. The October 2013 launch would include the basic functionality a taxpayer needed to register with the ZRA, file a tax return, and manage tax payments. Other modules, such as refunds, auditing, debt collection, investigations, objections and appeals would be implemented later, once the basic system was up and running.

Data Migration

One of the most challenging issues the team faced was migrating data from the old fragmented systems into the new system. "When we move to the new system we are not going to ask the taxpayer to register afresh,"

Kabamba said. "Given that the data structures were different between the old system and the new system, we needed to identify the data elements that we were going to migrate."[13]

One set of data was demographic information on taxpayers (e.g., names and national registration numbers). The ICT team extracted the data from the old systems and enriched the data by formatting it in a way that would work in the new system. The more difficult questions concerned data on transactions. "For example if you look at the VAT return in the old system and the VAT return in the new system, they are completely different," Kabamba said. "We are capturing a lot more data on the new system than on the old system. How do you handle the data that already exists? How do you migrate the VAT returns on the legacy system if they can't fit into your new structures?"[14]

After several months of engaging with ZRA staff, the team decided to migrate the closing balances for VAT and income tax for each taxpayer into the new system. For the other tax types, no data was transferred to the new system. Instead, ZRA staff reconciled accounts on the old systems then manually inputted a balance on the new system. The team adopted this strategy in part because of the poor quality of data in the older systems. "Sometimes we would not even agree on a tax position with a client," Kabamba said. "So on the new system we put a functionality so the tax operatives, when they discuss with a client and arrive at the correct account position, they can put the closing balance, be it debit or credit, manually on the new system." Those balances required approval by authorized ZRA officers. The solution was imperfect, but allowed the ZRA team to quickly prepare the system for new users.[15]

Some taxpayers were not migrated to the new system because they did not meet data migration criteria. This included foreigners, who did not have a national identification number, and others with data problems, such as two people who reported a duplicate identification number. Those users would have to re-register with the ZRA.

Change Management

The ambitious nature of the TaxOnline project led the ZRA to include a change management leader in the

11 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
12 Author interview with Yvonne Marion Mwana, ZRA, February 11, 2019.

13 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
14 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
15 Author interview with Christopher Kabamba, ZRA, February 12, 2019.

project team. This was Chisanga Kashoki, who had worked in the ZRA since 1994 and came to the team from the revenue authority's large taxpayers office. "I had no clue what the job would be like," Kashoki said. "It was something completely new. We hadn't had change management before."[16] Her role was to communicate with ZRA staff and taxpayers about the coming change and how it would impact them.

To teach ZRA employees how to use the system, Kashoki used a trainer of trainers model, educating revenue authority staff in how to process registrations, returns, and payments through the TaxOnline system. ZRA staff from offices throughout the country received training in those functions, with the goal of sharing that knowledge with others in their areas. "These would be our representatives in those offices," Kalambo said. "If there was any challenge, people would go to them."[17] In ZRA headquarters in Lusaka, a similar model prevailed. Staff who received training were deemed "super users" who could assist others in using the system. Over 700 ZRA staff received this training in TaxOnline (Zambia Revenue Authority, 2014).

Kashoki worked closely with a change management expert provided by the United States Department of Treasury. "The takeaway [of that partnership] is how we need to communicate in as many different ways as possible, that there were going to be many different kinds of reactions to change, and that we needed to pull people in and let them know what was going to happen to them," she said.[18]

There was some modest resistance to the project within the revenue authority because people feared losing their jobs or seeing their responsibilities change significantly due to TaxOnline. "The ones who collected money, the ones who received the returns… all this would be done online," said Chiseshe Ng'oma, assistant director, treasury in the ZRA's finance division. "Some people just didn't want anything to do with it."[19] Another group who questioned their future were data entry officers. Although employees did not directly threaten to revolt against the system or slow down implementation, the revenue authority's leaders wanted to minimize discontent among employees. These worries led the commissioner general of the ZRA to declare that nobody in the revenue authority would lose their job as a result of the introduction of the project. Workers whose positions became redundant would be redeployed to other assignments.

The other aspect of change management concerned taxpayers. Kashoki and the TaxOnline project team wanted to educate taxpayers on how to use the new system and combat any resistance to change from individuals and businesses. That resistance from some taxpayers was due in part to a simple unwillingness to change deeply ingrained habits and adopt new technologies, but also because the new system could make tax avoidance more difficult and thus result in higher payments to the ZRA. "Sometimes when you innovate, the first reaction from the taxpayer is to reject it because it will make them pay the correct amount of taxes," Mwanza said.[20]

The ZRA held workshops and meetings with taxpayers to share information about the new system. The initial curriculum concerned how to log into the online system and get taxpayer credentials. A second level of education focused on how to file specific types of tax returns on TaxOnline. At first, the team focused on taxpayers who were already registered in the system. After that, Kashoki and her change management partners started to show new taxpayers how to register for and use the system. Due to the tight timeline, however, much of this education and training would take place after the system had already been launched.

The TaxOnline system used Excel spreadsheets for preparing returns, and the low computer literacy of some taxpayers meant this would be a challenge. "We took them through a basic Excel [training]… like the creation of a CSV file so they could upload it," Kashoki said.[21]

One basic issue was that the system provided users with new taxpayer identification numbers (TPIN). "We had to inform them of the steps that would happen, when they are going to get a new TPIN number," Kashoki said. "Rather than coming to ZRA, they could log in and check for their TPIN number." A related matter was that taxpayers who filed value-added tax returns had to report the TPIN numbers of the people or businesses from whom they made purchases or to whom they made sales. "We had meetings with them, we had different adverts that we ran with [the ZRA] corporate communication team to make sure they were aware of that."[22]

16 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.
17 Author interview with Claydon Kalambo, ZRA, February 11, 2019.
18 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.
19 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
20 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
21 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.
22 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.

The ZRA corporate communication office produced advertisements for different media. Taxpayers received information on TaxOnline through radio, television, billboards, and newspapers. Radio reached a large audience, but newspaper advertisements were less effective because the price of newspapers was relatively high, Kashoki said. "We found that social media helps, like putting things on our Facebook page."[23]

There were additional difficulties in getting companies to understand and adapt to new procedures. "There are certain companies that have accounts personnel who are used to coming to ZRA and spending the whole day at ZRA, either doing a registration or submitting a return," Mwila said. "They would get a lunch allowance and a transport allowance. So when the e-platform arrived there was some resistance because the accounts personnel wanted to continue doing things the old way."[24] The revenue authority had to request that companies send the person in charge of tax registration and return filing for training on how to use electronic services. The result was that staff members could now file returns online from the company's office.

Going Live with TaxOnline

The TaxOnline system went live on October 28, 2013. As planned, the phase one launch included registrations, returns, and payments, although at the time of the launch the payment module only could provide manual receipting of payments. Taxpayers could not yet make payments online because the ZRA was still negotiating with commercial banks to set up electronic payment options.

The system was functional, but the TaxOnline team had to work hard to manage the rollout. One problem was that the staff training did not yield the intended results and many ZRA employees struggled with the system. TaxOnline team members had to help answer questions and solve problems.

The TaxOnline project team was overwhelmed with the number of people who were confused, needed help using the new system, and as a result ended up visiting ZRA offices in person. The team believed this was due in part to inadequate education and sensitization for taxpayers. "Most of our training happened after we rolled out," Mwanza said. "There was inadequate time to train most of the taxpayers."[25] Taxpayers were visiting or calling ZRA with questions or still coming to ZRA for services when they could conduct their business online." The revenue authority reported an increase of wait times at ZRA offices in 2014, with only 48 percent of clients being attended to within its standard of 20 minutes (Zambia Revenue Authority, 2015).

Problems related to data migration affected some taxpayers. "Those first few days we had taxpayers flocking to our offices," Kabamba said. Taxpayers who did not meet the minimum requirements for migration to the new system could not access their information, with problems like the lack of an identification number associated with the account hindering this access. These users had to be re-registered on TaxOnline, contributing to the long queues at ZRA offices. "A number of them were not very happy."[26]

There were a variety of other issues. Some business associations complained that the new returns in TaxOnline required them to input more information than in the past.[27] Some users inquired about basic matters of computer and internet literacy, such as how to create a strong password. In March 2014, the author of a newspaper column about small business owners reported that most small- and medium-sized enterprises lacked computers and internet connections or struggled to use that technology, making it difficult for them to understand what the revenue authority now required (Times of Zambia, 2014). The TaxOnline website also suffered periodic outages for a time after the launch when it experienced too much traffic. During the months after October 2013, the team identified various bugs for TCS to fix.

Uptake was relatively slow in the first month, when only three percent of returns were filed online.[28]

Responding to Taxpayer Needs

After the launch, the TaxOnline team undertook a number of measures to fix problems and encourage usage of the system. Within the first week after the launch, team members dispersed throughout the country to provide first-hand support to ZRA officers. The team had

23 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.
24 Author interview with Irene Mwila, ZRA, February 11, 2019.

25 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
26 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
27 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
28 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.

planned to visit those offices at some point in the future, but it became clear that their help was urgently needed.[29]

Taxpayers had raised complaints about difficulties accessing the website and reaching ZRA over the phone. In response, the revenue authority established a call center, co-funded by the Investment Climate Facility for Africa, to give taxpayers instant access to an operator for any tax-related issue. ZRA also added more staff to its helpdesk team, which was responsible for responding to taxpayer queries.

As training continued after the launch, Kashoki and her colleagues revised their approach to training. "We realized we needed to go around and train staff again so they would be more comfortable," she said. After this point, the revenue authority trained relevant staff before implementing a change on the system and the training groups were larger to directly incorporate most of the staff who could benefit. Kashoki and her colleagues also followed up with staff who were trained to ensure that they understood the training and provided a link to a test version of TaxOnline for them to practice with so they could become comfortable with new processes before they went live. Staff received periodic emails with updates on changes to the system, and the revenue authority established a unit under the domestic taxes division to assist staff who had questions about the system.

Kashoki also continued to reach out to taxpayers so they would be better prepared to use the system. Initially, she had anticipated needing only four to six weeks of education and outreach for taxpayers, but that was extended to about five months after the system went live. A critical aspect of this was inviting any interested taxpayer to come for a free in-person workshop. "We went up to about February [2014], having sessions at our training center, morning and afternoon," she said. "Telling people you can come through and we'll show you how to file your returns or answer your questions."[30] The training lasted roughly two hours, but took less time for taxpayers who were computer literate.

To address issues with taxpayers lacking internet access, the ZRA set up bureaus for internet services at larger revenue authority offices around the country. At these sites, a staff member was stationed with five to ten computers, and assisted taxpayers to sign up for and use TaxOnline. "This went on for some time, maybe four or five months, just trying to set up people and stabilize the system," Kalambo said.[31] In more rural areas, taxpayers could visit the staff in local ZRA offices to receive one-on-one assistance.

Implementing Additional Modules and Interfaces

After the basic TaxOnline functionality launched in October 2013, there was no opportunity for the team to take a break. They had to prepare additional modules for the phase two rollout the following year; among others, these included modules on audit, investigations, objections & appeals, debt collection, and refunds. These functions were less visible to the taxpayer, but vital to a well-functioning electronic tax administration system. The team continued to meet with ZRA staff to develop blueprints for TCS, trying out the patches in the test environment, and ensuring that they delivered the desired outputs prior to going live.

The ZRA had to develop some stopgap solutions to continue certain tax administration processes after the launch of TaxOnline but prior to the full rollout of the phase two modules in 2014. One example was refunds. Under Zambia's value-added tax system, businesses could claim a credit on VAT paid for input materials and services. These credits resulted in many businesses receiving refunds from the ZRA, and keeping this money flowing was important for the economy. When the system went live in 2013, the refunds module was not ready, so the ICT team created a stopgap measure by writing a computer script that allowed VAT claims to be filed on TaxOnline while auditors worked from the old system to process refunds. It took months of additional work for the refunds function to be fully integrated into TaxOnline. All the modules were ready by May 2014, when phase two went live.

The team also developed interfaces with other government agencies to share data relevant to the tax system. An interface allowed the ZRA and another agency to maintain separate data systems but automatically exchange certain information. Building interfaces so this information flowed easily to ZRA was often challenging because agencies had varying levels of ICT infrastructure and different rules about sharing data. Over time, ZRA set up several useful partnerships

29 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
30 Author interview with Chisanga Kashoki, ZRA, February 11, 2019
31 Author interview with Claydon Kalambo, ZRA, February 11, 2019.

with other agencies. An interface with the agency that registered companies and small business names allowed ZRA to use that registration information to verify its own data. An interface with the road traffic agency shared data so that ZRA could provide tax clearance for the sale of a car. A link with the customs database allowed the revenue authority to crosscheck customs declarations with domestic tax declarations. While some interfaces were operational in the years following the launch of TaxOnline, others were still being constructed in 2019.

After the remaining modules launched in May 2014, ZRA continued to make changes to the system. The revenue authority simplified some processes and revised certain forms, such as the introduction of a streamlined taxpayer identification number registration process in 2017. Some updates to the system were also necessary to reflect the evolution of tax legislation from year to year. Changes to the system required continued cooperation with TCS. ZRA extended the original three-year support and maintenance contract with the company, which covered small updates to the system. If the team found a bug, TCS made the required fix at no extra cost. But larger changes required negotiation with TCS on an additional fee. "We've had times when we had to make complete changes," Kabamba said. "For example, when we introduced withholding VAT, that is something we had to build onto the system."[32]

Engaging with Commercial Banks

Providing electronic tax payment options for Zambian citizens required a lengthy engagement with the country's commercial banks. The goal was for taxpayers to use their bank accounts to pay their tax electronically, or visit a bank branch to make an e-payment even if they did not have a bank account. The team had originally hoped that taxpayers could use this service when the system launched, but that was not the case.

There were several reasons that the banks were slow to act. Most Zambian banks were divisions of international companies, so their decision-making process required communication with headquarters in other countries, such as the United Kingdom, the United States, or South Africa. Given that Zambia was a relatively small country, the concerns of a large bank's Zambian branches might not be taken up as urgently as other matters. Some of the banks

were running on outdated core banking platforms and had to upgrade their systems to integrate with TaxOnline.[33]

A small local bank that could act more quickly was the first to come on board, in August 2014. Others began to join in the coming months. The banks were free to determine their own fees for customers to submit electronic tax payments, and some banks provided a service whereby taxpayers without bank accounts could visit a branch to submit a tax payment for a small fee. By December 2014, the majority of commercial banks in Zambia had partnered with ZRA, but a few international banks lagged behind. To push them to comply, the revenue authority gave banks six months to meet a November 2016 deadline. "We reached a point where we said if you are not on board, your clients will not be able to pay taxes through you and they will not come to our cash offices, so we will ask them to move to other banks to pay their taxes," Ng'oma said.[34] That decision raised the prospect of banks losing customers because of their failure to offer e-payment services, helping push the remaining international banks into the system. The remaining banks soon complied.

Ramping Up Usage through Laws and Incentives

To drive up usership of TaxOnline, ZRA used both laws and softer incentives. "Initially, it was just encouraging taxpayers to file online," Mwanza said. "It was not mandatory."[35] But new rules after the system's launch compelled certain groups to file online. For example, VAT returns could only be filed electronically. Companies with ten or more transactions had to file their tax returns online.[36]

There were other ways to incentivize change. The ZRA gave taxpayers filing online a due date several days later than those filing manually. The authority also allowed taxpayers to start from scratch when, in 2017, the ZRA commissioner general declared an amnesty for penalties and interest accrued from 2013 to 2017 provided the principal tax was paid in full and all returns filed. This was helpful for the period 2013 to 2014 when many people received late filing or payment penalties

32 Author interview with Christopher Kabamba, ZRA, February 12, 2019.

33 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
34 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
35 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
36 Author interview with Christopher Kabamba, ZRA, February 12, 2019.

due to ignorance, resistance to the new system, or a combination of the two.[37]

Results

In less than one and a half years, the TaxOnline project team delivered an electronic tax administration system that provided a number of clear benefits for the ZRA and Zambian taxpayers. Instead of processing registrations, returns, and payments manually, users could carry out their tax obligations online. The portal also offered taxpayers the ability to calculate their taxes and plan for the future, ask questions and track the status of their queries, receive SMS alerts and reminders, and access a variety of information on the Zambian tax system (Investment Climate Facility for Africa, 2013).

Over the first two years of TaxOnline, the ZRA paid a total of $8,786,550 for the system. The majority of that cost covered the initial system setup, while $2,428,800 went toward support and maintenance over that time period.

The usage of TaxOnline's electronic services steadily grew over time. In November 2013, a month after the launch, 437 returns were filed online. In December 2013, 3,897 taxpayers filed online (Zambia Revenue Authority, 2014). In 2017, 1,987,675 returns, 98 percent of the total, were filed electronically while only 2 percent were filed manually. The remaining manual returns were primarily from small taxpayers who lacked internet access. By 2019, over 90 percent of registrations were processed electronically, and around 70 percent of payments were submitted to ZRA electronically.[38]

As for the bigger question of whether TaxOnline led to greater revenue collection, the team felt there was not enough data. "It's not easy to quantify the revenue increase as a result of TaxOnline because there are too many factors," Mwanza said. "We can only talk about e-payment, e-filing, and e-registrations."[39]

There were clear gains in the taxpayer experience under TaxOnline. "In the past, the taxpayer would submit a [paper] return and it would take a long time, and sometimes just disappear with nobody able to account for it," Mwanza said. "But now a taxpayer is able to file online and it … is automatically posted."[40] There was also

greater transparency. Taxpayers could log into TaxOnline and see their tax status and all information related to their accounts. "I can't see anything the taxpayer can't see," Ng'oma said.[41]

The efficiency of the ZRA increased with TaxOnline. The time it took for filing, payment, and processing of tax returns dropped from 10 to 16 days before the system launched to within one day in 2014 (Zambia Revenue Authority, 2015). Taxpayer registration could be done within a day instead of the previous three days. "We have seen an increased throughput in the revenue we are collecting," Ng'oma said. "It used to take us four to five days to get that money to government. Now it takes us a day, at the most two."[42] This meant money was moving more quickly to the central treasury so the government could meet its spending obligations.

There were some concrete ways in which TaxOnline contributed to taxpayer compliance. Many errors and fraud that were possible on a paper-based return were not accepted by the TaxOnline system. "There are certain validations built into the system," Mwanza said. "The taxpayer cannot proceed, so they are forced to correct it before they submit."[43] There was also the ability to crosscheck between tax types and across systems to catch errors or evasion. For example, information on the customs database can be checked to identify cross-border traders who may not be filing on the income they gain from those transactions. Data on car sales helped identify people who are buying and selling cars for a living, and the ZRA could check that they are filing accordingly. TaxOnline also automatically generated penalties, which was not the case with the previous systems (Zambia Revenue Authority, 2015). "The moment you don't file, we know," Kalambo said.[44]

"When you file a return, we are able to see who your suppliers are," Ng'oma said. "If any one of those is not registered for tax, we can contact them. … The law allows us to forcibly register them."[45] ZRA asked larger corporations, like banks and mines, to send the revenue authority lists of vendors before paying them so ZRA could check whether the vendor was registered for taxes and whether it owed taxes. If tax was owed, the revenue authority could garnish the corporation's payment to the vendor.

37 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
38 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
39 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
40 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019

41 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
42 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
43 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019
44 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
45 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.

One of the benefits of the introduction of electronic services was an improvement in revenue collection attributed to a reduction in bloated VAT refund payments. "We used to have a number of bogus claims," Mwila said.[46] TaxOnline eliminated the ability for a taxpayer to claim on an invoice when the provider of the goods or services was not actually registered for VAT, because the new system was able to validate the registration status of a particular taxpayer identification number.

The rise in electronic payments reduced fraud by virtually eliminating what had a been a persistent problem of bounced checks, amounting to millions of kwacha.[47] There had been thousands of such checks submitted to ZRA every year, but by 2018 that had fallen to around ten.

The movement to e-payments reduced the need to deploy ZRA staff to tax offices. "It has helped us reduce overtime," Ng'oma said.[48] Previously, the authority also had to provide security around cash offices and pay high insurance premiums because those offices held large amounts of cash. The reduction of cash exchanges also reduced opportunities for corruption.

Finally, TaxOnline provided a wealth of data to the ZRA, which previously relied on scattered information sitting on three different systems to work with. "Before TaxOnline, there were three different systems in a space of about six years," said Laban Simbeye, the assistant director of statistics and data management at the ZRA. "VATLink for VAT in some stations, ITAS for Pay as You Earn, VAT and Corporate taxes, and TARPS for the remaining taxes. Payments on VATLink were manually receipted and posted onto VATlink. Because of this, it was difficult to trace payments, especially for VAT, and this prevented us from doing timely analysis on that data."[49] The new system collected information from all returns and their accompanying attachments and schedules. VAT returns provided a record of the sales and purchases by a business, in effect "a mapping of all the business transactions that are carried out in the economy," said Samuel Mulenga, a senior economist at the ZRA. "For policy purposes, it goes a long way. For analysis, administration, interventions, anything you can think about, that information is there."[50] Data was available in one place and could be easily shared with other government agencies provided it did not breach taxpayer confidentiality requirements. The influx of data incentivized various units within the ZRA to hire data analysis staff.

This data provided by TaxOnline had a number of benefits for the revenue authority and the Zambian government. The research and policy department could better analyze the impact that a proposed tax policy change would have on government revenue and the economy. TaxOnline data allowed the central bank and central statistics office to produce quarterly growth estimates without having to conduct an expensive and time-consuming survey.[51] Compliance management benefitted from information such as who was filing on time, who was filing late, and who was filing new returns. The ZRA compared TaxOnline data on filing activity with customs data to create more informative reports targeted at improving taxpayer compliance. An analytics unit that specialized in refunds could track the flow of VAT refunds between taxpayers, including who was filing nil returns and the validity of invoices and claims. "I can say every person [at the ZRA] that has some analysis or intelligence information need relies very much on TaxOnline," Mulenga said."[52]

Lessons Learned

While the TaxOnline project produced strong positive results, ZRA personnel who worked with the system had several insights that might guide other countries seeking to implement an electronic tax administration system. They advocated greater control over the source code, a realistic timeframe and sufficient staff working on the project, and allowing for ample training and education before a system goes live.

Controlling the Source Code

Several interviewees at ZRA suggested that a revenue authority would benefit from owning the source code for the system. With a third-party developer, the cost of making changes to the system could be quite high, as anything not included in the original contract required negotiating further payment. "Any time a change needed to be made, it had to go back to the developers," Mulenga said. "That became very costly over time. If you think

46 Author interview with Irene Mwila, ZRA, February 11, 2019.
47 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
48 Author interview with Chiseche Ng'oma, ZRA, February 12, 2019.
49 Author interview with Laban Simbeye, February 12, 2019.
50 Author interview with Samuel Mulenga, ZRA, February 12, 2019.
51 Author interview with Samuel Mulenga, ZRA, February 12, 2019.
52 Author interview with Samuel Mulenga, ZRA, February 12, 2019.

about developing your own system, own the source code so you are able to make amendments and develop it."[53]

This was important because the tax system can change due to decisions outside of the control of a revenue authority, such as a statement from the finance minister about tax policy. Such changes were common in Zambia, and often necessitated updates to the electronic tax administration system. This could be costly if not covered by the original contract with the developer.

Kabamba, who later became ICT technical lead on the project team, noticed the lack of control over the source code when an error was discovered in the system. "You find it's like a black box," he said. "Someone is trying to file a return and it's giving you an error. You don't know what's happening inside the system… It also impacts on service delivery because the turnaround time for each incident is quite high. You don't close incidents as quickly as you would want to… because you don't have access to the internal workings of the system."[54] He recommended that revenue authorities find a partner to help develop a system over which the authority retains intellectual property rights, rather than purchasing an off the shelf system and not having control over the code.

Realistic Project Plan and Sufficient Staff

The tight implementation deadline meant that there was limited time for testing the system before it went live and for training both ZRA staff and taxpayers. Allowing the team more time could have reduced some of the problems that emerged following the system's launch.

A common refrain from members of the project team was that some of ZRA ICT staff were required to implement a new project while still doing their regular jobs. "There should have been a project team that was responsible to deliver the solution and they are not involved in business as usual," Kabamba said.[55] There were nine ICT officers attached to the project, but they could not fully focus on it because of their day-to-day responsibilities.

Mwanza also highlighted the need to ensure that the revenue authority staff were able to handle the requirements of the new system. "We concentrated so much on reengineering the processes in the system, then

you neglect the physical structures," she said. "A system like TaxOnline requires a lot of people in the back office."[56]

Good Training and Outreach

The problems ZRA staff had in responding to taxpayer problems after the launch of TaxOnline demonstrated the importance of training staff and educating taxpayers. "I don't think we realized the magnitude of the training we needed to do, and the training took longer than we anticipated," said Chisanga Kashoki, who led change management in the TaxOnline project team.[57]

Kashoki believed several changes could have improved the initial staff training program. First, she would involve more staff in testing the system before it went live. Second, she would have incorporated more staff into the training program and spent more time training them. Third, she would have provided more user-friendly training manuals and training videos on the new work processes that TaxOnline required. Fourth, she would have had the training team visit staff after the training to ensure they were comfortable with the system. Finally, she would have created a training server so that staff could practice on the system before the rollout.

Revenue authorities pursuing electronic tax administration should ensure that staff are adequately trained in how to use the system. Train-the-trainer approaches may benefit from follow-up to ensure that staff throughout the organization are getting the information they need. In the TaxOnline case, the train-the-trainer approach used left many staff apparently unprepared for the launch of the system, forcing the TaxOnline project team to quickly disperse to different ZRA offices to help staff use the system and manage taxpayer problems.

Ideally, the taxpayer outreach and education would have started earlier, well before the launch of the system, giving the ZRA more time to prepare Zambian citizens for the coming change. "We didn't train the taxpayers beforehand, we trained them after we rolled out," Kashoki said. "That caused a lot of initial tension at the beginning between us and the taxpayers."[58]

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53 Author interview with Samuel Mulenga, ZRA, February 12, 2019.
54 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
55 Author interview with Christopher Kabamba, ZRA, February 12, 2019.
56 Author interview with Yvonne Marion Mwanza, ZRA, February 11, 2019.
57 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.
58 Author interview with Chisanga Kashoki, ZRA, February 11, 2019.

Bibliography

Economist Intelligence Unit. (2015, July 24). *Zambia issues US$1.25bn Eurobond*. Retrieved from Economist Intelligence Unit: http://country.eiu.com/article.aspx?articleid=1823377766&Country=Zambia&topic=Economy&subtopic=Forecast&subsubtopic=Policy+trends&u=1&pid=833450867&oid=833450867&uid=1

Investment Climate Facility for Africa. (2013, November 4). *"Zambians Now to File their Taxes Online"*. Retrieved from Investment Climate Facility for Africa: https://advance-lexis-com.ezproxy.princeton.edu/api/document?collection=news&id=urn:contentItem:59S3-H5X1-DY15-S1W7-00000-00&context=1516831

Mwila, A., Manley, D., Chileshe, P., Phiri, E., & Mpembamoto, K. (2011, January). *The Taxation System in Zambia.* Retrieved from Jesuit Centre for Theological Reflection: https://www.taxjustice-and-poverty.org/fileadmin/Dateien/Taxjustice_and_Poverty/Zambia/JCTR/JCTR_2011_Tax_System_Zambia.pdf

Nalishebo, S., & Halwampa, A. (2014). *Uncovering the Unknown: An Analysis fo Tax Evasino in Zambia.* Retrieved from Zambia Institute for Policy Analysis and Research: https://www.africaportal.org/publications/uncovering-the-unknown-an-analysis-of-tax-evasion-in-zambia/

Times of Zambia. (2014, March 18). *"Tax Online's Running Effects"*. Retrieved from Times of Zambia: https://advance-lexis-com.ezproxy.princeton.edu/api/document?collection=news&id=urn:contentItem:5BSG-P8F1-JC86-C0M2-00000-00&context=1516831.

World Bank Group. (2016, December). *Zambia Economic Brief: Raising Revenue for Economic Recovery.* Retrieved from World Bank Group: http://documents.worldbank.org/curated/en/166021480932290112/pdf/110728-WP-P157243-PUBLIC-ZambiaEBRaisingRevenueforEconomicRecoveryDecember.pdf

Zambia Revenue Authority. (2014). *2013 Annual Report.* Retrieved from Zambia Revenue Authority: https://www.zra.org.zm/manageUpload.htm?ACTION_TYPE=view&CIRCULAR_KEY=REPORT&DOC_ID=999000000001591

Zambia Revenue Authority. (2015). *2014 Annual Report.* Retrieved from Zambia Revenue Authority: https://www.zra.org.zm/download.htm?URL_TO_DOWNLOAD=//web_upload//PUB//2014%20Annual%20Report%2024_06_201520072015090926.pdf