Finding your customers to reduce losses – a case study

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1 Introduction

Increasing non-technical losses is a growing concern for many utilities and distributors through-out Africa. One of the key contributors to increasing losses is that the utilities do not have the relevant data regarding their customers to support loss reduction/revenue enhancement initiatives.

It is essential that utilities manage and maintain all point-of-connections (PoC) with related customer and meter data. This implies accurate spatial locations to enable follow-up work as well as quality assurance. Embarking on a project to field collect PoC data provides the ideal opportunity to at the same time capture and model the customer-network-link which is essential for more advanced utility services (outage management, network planning, etc.)

Finding your point-of-connections, customers and meters is huge logistical exercise that can only be done in a digital environment with comprehensive underlying quality assurance processes.

This paper presents a case study for an electricity distribution company in Nigeria with approximately 1,000,000 customers, rural and urban, distributed over 154,000km². The utility launched a significant field capture and back office modelling project to ensure all consumers are correctly captured on their systems to facilitate loss reduction and at the same time create a customer-network-link to enable more advanced technical operations in the utility.

2 The Challenge

2.1 Nigerian Power Sector Privatisation

The Nigerian Power Sector was privatised in 2012. In the distribution space, 9 distribution companies (Discos) were created from the prior state-owned enterprise.

The new investors were met with the stark reality of severely run-down assets both in the distribution networks as well as company fixed assets including offices, vehicles stores etc.

Adjudication of Discos to private investors were largely based on what investors committed to in terms of reducing the significant losses experienced in the previous utility. The submission made were based on baseline ATC&C (Aggregated Technical-, Commercial & Collection) loss figures provided by the Nigerian Government.

It did not take long for the new Disco owners to realise that the provided loss figures on which they submitted their proposals was wrong. This prompted all Discos to launch their own ATC&C loss studies to determine actual losses. The outcome of these invariable showed much higher losses than that provided for bidding purposes. For this case study the Disco faced **56%** ATC&C losses. Coupled with the constraint generation and transmission supply, the projected income figures from energy sales were clearly flawed and the importance of loss reduction became a priority.

The challenge to reduce losses is significant due to various factors explained in this paper. This is not simply a case of customers not wanting to pay for electricity, this is a case of poor service delivery over many years that has justifiably created an environment in which a large portion of the customer base is not willing to pay for a service they believe they are not receiving.

This is further compounded by poor customer and connection data making it extremely difficult to launch loss reduction initiatives. The customer and billing databases showed a combined customer count of ~700,000 active customers of which less than 500,000 showed any activity in terms of payments/purchases made in the prior 12-month period. This distorts the split between commercial and collection losses as the portion of the ~200,000 active customers not paying bills result in a higher collection loss – the fact is that the bulk of this loss should rather have been recorded as a commercial loss as the bulk of these customers will most likely never start purchasing again within the current database – they have either left the area or are ghost customers that cannot be traced. While this does not affect the overall losses at the utility, it provided the basis for a significant change in loss reduction focus.

We need not appoint debt collectors, we need to find our customers to ensure they are correctly billed and that all Point-of-Connections can be tracked for future follow-up work.

2.2 Other factors contributing to non-technical losses

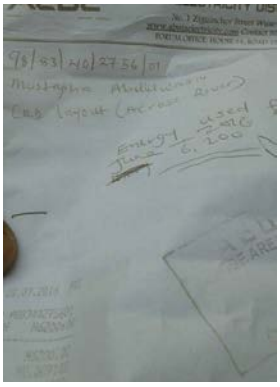
To understand the high losses in the Nigerian Power sector, it is important to consider the environment that has created this scenario.

- Most customers are not metered (~65% of customer base). These customers are on ‘Direct Billing’ which essentially relates to an initial estimate of load (energy consumption) made when the customer applied for electricity. This same consumption estimate is then billed monthly.

There is a regulatory requirement that billing is adjusted based on supply provided to the respective feeders, but due to a non-existing customer-network-link and poor data this is essentially impossible.

This is a horrible approach to billing – it creates space for fraud when the initial estimates are made, it is almost never reviewed and adjusted based on consumer’s own consumption increase. And above all it creates a significant resistance to pay, especially in a generation constrained environment where forced load shedding happens almost daily. It is not justifiable to request a customer to pay the same amount for two months if supply in one month was reasonable and in the next only half of that received the previous month.

- Billing based on estimated demand leads to inefficient energy usage patterns since there is no incentive for the customer to reduce his energy consumption if he gets billed on his premise type and size alone, often leading to under-billing of real consumption.
- Customer engagement (Marketers): Most Nigerian utilities have the equivalent of meter readers which if referred to as marketers. It is the marketer's responsibility to manage the customers assigned to them. This includes facilitating consumption estimates, delivering bills, and essentially manage all formalised utility communication. While marketers are not allowed to accept payment from customers some manipulate the system to receive payment, even going as far as issuing hand written receipts.
- Shared Accounts: Another prevalent activity in Nigeria is where a customer is connected to the grid and subsequently an illegal supply is given to one or more of the customer's neighbours from that same connection. The neighbours then pay the customer a share of his monthly fixed "Direct Billing" bill. In a fully metered environment this would not have been such a big issue from a losses perspective as the consumption would have been measured. The significant issue here is that the fixed monthly assessment is not adjusted – the utility supplies much more power to the customer than initially assessed. Initial indications are that this practice also referred to as "Shared Accounts" exist at approximately 30% of all small power users audited.



- Untidy networks and poor data: While one may expect that certain issues should easily be identified by the utility personnel, these are often not visible because of untidy LV networks. Faulty meters are simply by-passed, and only at times will the customer change to Direct Billing, LV networks are so intertwined that it is impossible to easily identify supply without doing a clean-up or detailed trace from the LV feeders. To compound the issue the utility data kept on customers is often too incomplete for field follow-up. Only the marketers have a good feel for their areas of responsibility and this further supports unscrupulous behaviour by the personnel so inclined.

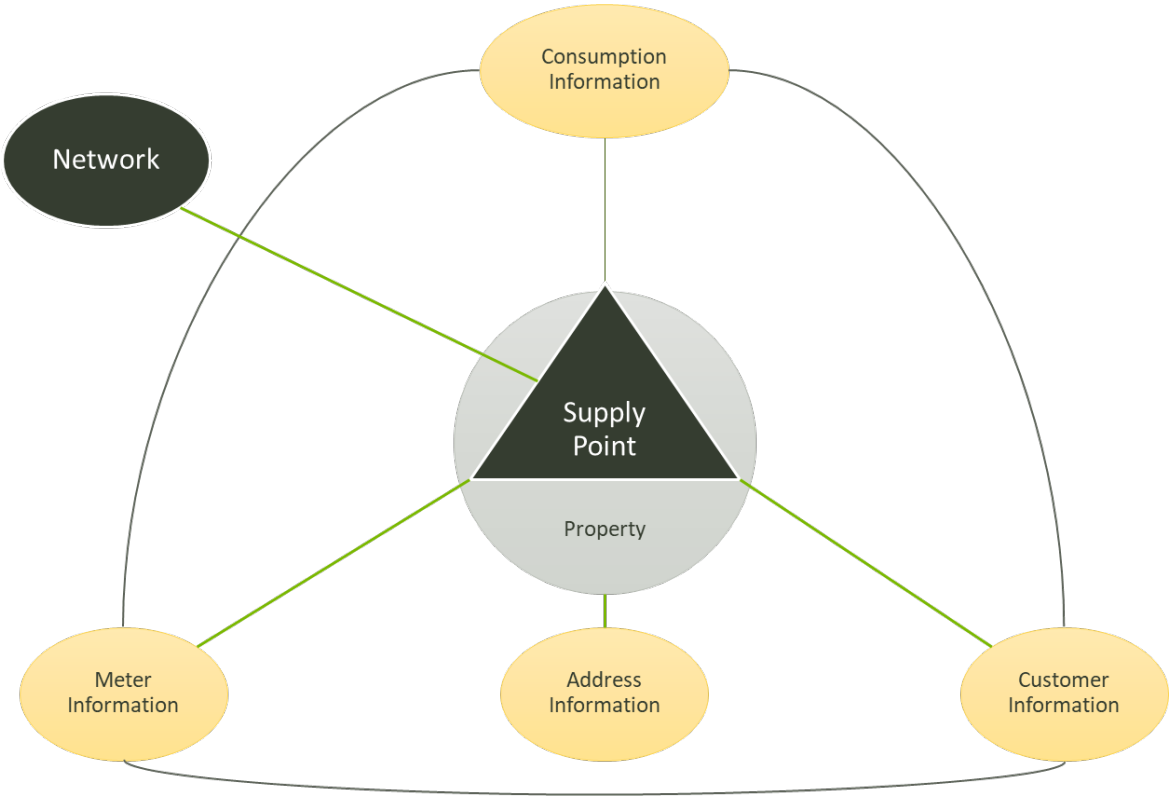
3 The Solution (or at least the start of it…)

It was evident that one of the key issues the utility faced was that it did not have sufficient information on their consumers and networks to support any type of non-technical loss reduction initiatives.

The utility needed to obtain data regarding their networks and consumer base. The following questions needed to be answered:

- Where do we supply consumers on our networks (Point-of-Connections)?
- What is the details of customers that at this moment are supplied at those PoC's?
- Do these customers exist in the current billing and vending systems?
- Are the customer's tariffs correct?
- Are the customers data up to date (address, mobile number etc.)?
- What other work is needed at that PoC (investigate tampering, new meter installation, installation repairs etc.)?
- How does the customers connect to the network (Develop a Customer-Network-Link)?

The old national utility never had the concept of a point of connection (PoC) embedded into their systems. They purely managed their customers and without reference to any detailed spatial locations (apart from regional groupings), the customer data in the vending and billing databases quickly became unusable. A significant decision by the utility was to place emphasis on managing the Point-of-Connection with its related data (customer, address, meter, etc). The utility needed to establish a baseline of PoC's and existing consumers that could be used to identify and manage loss reduction initiatives.



4 The project

The utility launched a major initiative to field collect information on all POC's and related consumers on the utility networks.

To ensure an unbiased field audit, the decision was made that field work will be done on a clean slate approach – field teams would identify all consumers on the network and initiate a customer engagement to capture relevant location, customer and connection details. Only after the field capture, the project teams would then aim to link the consumer into the billing and vending system database. This was a very important decision as it created the foundation for a full audit of all consumers. It did add complexity to the process specifically relating to the linking of customers into the billing and vending systems post field audit.

Another key decision was that all audited PoC's would be issued a unique Point of Connection number. This number would become the key identifier common between systems to manage the PoC and related data.

For a PoC to be considered successfully audited the following had to be captured:

- Photographic evidence of premise, building, point of connection and a *utility account or prepayment voucher/meter number
- GPS locations for premise entrance, building entrance and point of connection

- Customer details were captured where provided, but was not compulsory as some customers do not want to divulge that information
- MV/LV transformer supplying customer (GPS position, known name)

  ** In some instances, consumers admitted to not being utility customers in which case they could not provide an account. These instances were recorded as such and highlighted as new customers to add to the utility systems.*

Where an audit could not be completed a uniquely numbered notice was placed to engage the consumer to facilitate a subsequent revisit by field teams.

Following a detailed back-office review of field data captured and compared with current utility system data, relevant instructions (job cards) had to be prepared and issues for PoC's requiring work.

A decision was made that the entire process was to be paperless using mobile and web technology developed by Aurecon.

4.1 Logistics

The significant requirements in terms of resources and logistics to execute a project like this should be of interest to utilities wanting to embark on such an initiative. The time spend in the field at a customer site is highly dependent on the data objects and related attributes to be captured on site. For this project, approximately 60 data items (including attributes, photographs and GPS locations) had to be captured per PoC.

As this project requires customer engagement to gain access to the point of connection as well as record relevant customer details, additional field time is to be included to allow for time to engage the customer.

The productive time spend in the field is determined by how quickly field teams can be deployed to their places of work. In rural areas this is challenging as travel distances become longer. Even in urban areas early morning despatching of resources and late afternoon return by resources are often hampered by peak traffic. As such it is almost impossible to achieve an 8-hour productive work day. On average it is more likely to have 6-hours or less of productive work in a work day.

Sufficient time and resources is required to perform effective customer sensitisation. This has been proven to be directly relational to the amount of "no-access" sites and can have great impact on reducing amount of rework and quality of customer engagement.

Field teams can maintain an average of 24 PoC audits on a day (including no access sites).

To audit a utility with ~1,000,000 consumers over 24 months with an averaged 10% no access rate implies the following:

Field Work:

- 126 field teams (field team consist of 2 persons for safety and cultural reason)
- Field teams grouped into platoons (7 teams/platoon) managed by field supervisor = 9 platoons
- 126+ Mobile devices for field application
- Laptops for 9 field supervisors (1 supervisor per platoon)
- Monthly Data for all devices (significant data use due to photographs and background aerial imagery)
- 5 Mini-busses – one bus can service two platoons

Back Office

- One back office data technician per 3 field teams = 42 back office data technicians

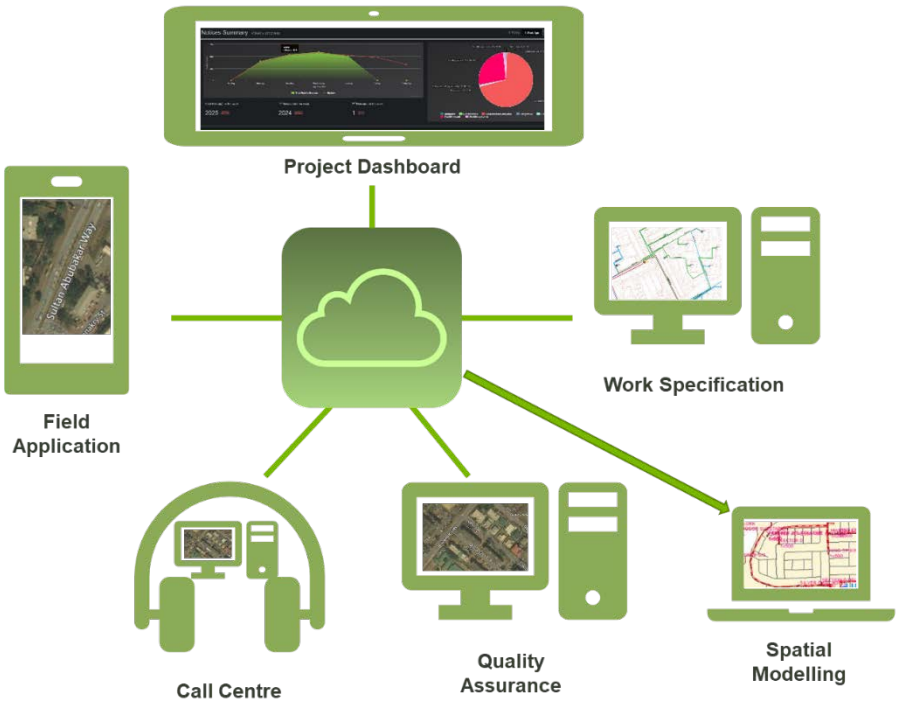
- 42 Desktops
- Data for back office web connection (web base application)

The above is a significant cost component and the utility opted to appoint the resources within their own ranks and have the consultants provide project management services, applications and quality assurance for the project.

4.2 Web based approach

As the decision was made to execute the entire project in a paperless environment it implied that all data processes had to be embedded into digital applications. The project team further decided that all data processes will be built into web-based solutions. This was a major decision as it enabled and simplified broad access to the relevant applications from across the organisation. Any updates or debugging done on an application component was easily rolled out as it did not require client-side application updates.

The figure below provides an overview of the solution deployed.



The core components included:

- **Field Application**: Mobile application for field data collection.
- **Quality Assurance**: 1st Quality Assurance review to accept or reject submitted field data for further processing.
- **Call Centre:** To allow for customer engagement to arrange re-visits where customers not at home.
- **Work Specification:** To do a detailed review of field data received and develop work packages relevant to PoC.
- **Project Dashboard:** Provides real time project progress view to management and project teams.

- **Spatial Modelling:** To enhance the value and quality of the collected data, the PoC's were imported into network modelling platform to establish a Customer-Network-Link. (Not web based).

Value Realised from Web-Based Approach

Quick turnaround time from field-to-office-to-field: Field submitted records could in most instances immediately be quality assured and any issues returned to field team for follow-up. This has a significant impact on time spend in the field specifically with regards to re-work.

Simple roll-out to new users: No need for application installations, simply a web connection with a username and password.

Simple process to update application components: Web pages updated and published – web login is to latest published version.

Common database in which all data managed: Apart from the common database ensuring that no complex integration between systems was needed, the common database provided a system wide visibility on all data aspects to the project team. Data integrity is high.

Real time project tracking for detailed team performance management as well as high level progress tracking is easily achieved through a dashboard view of underlying data.

The web approach ensured that the application server resources could easily be monitored and upgraded during the project by adding computing power, disk space and memory as required. System back-ups and disaster recovery is embedded in the hosted solution environment and ensures the project team focus was primarily on the technical work.

4.3 Mobile Field Application

The project deployed Samsung J5 mobile devices to facilitate the field data collection. Mobile phones were selected as the preferred field collection device due to:

- Its low cost compared to high-end GPS devices with embedded data collection
- Simplicity of application roll-out and updates through Android Play Store
- Web Map Services (Bing Maps) that could easily be integrated into the application
- Providing direct communication medium between the office and field teams
- Web based data upload when within mobile operator coverage

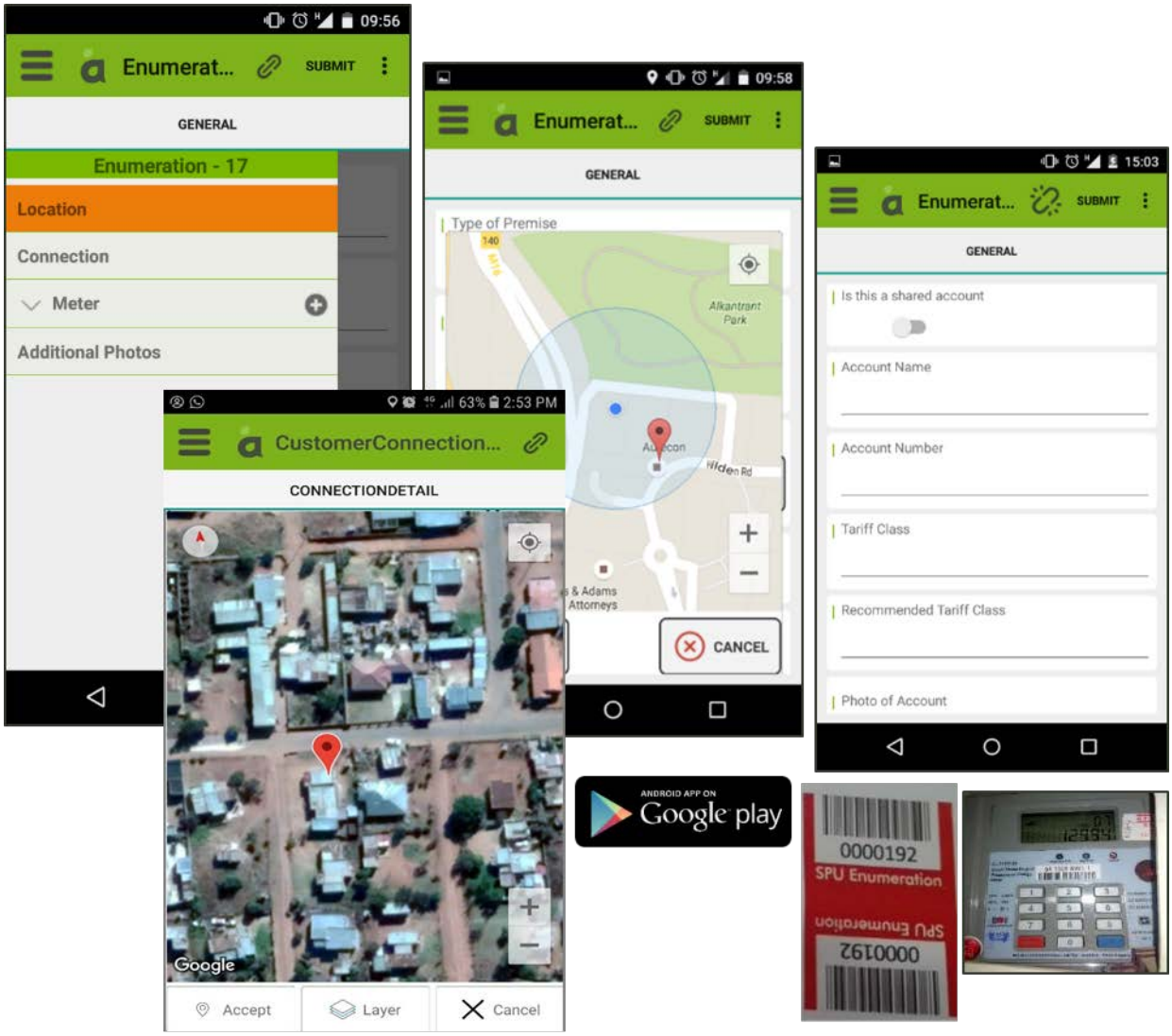
The biggest concerns using mobile devices related to:

- Battery life
- Screen size (User Interface)
- Mobile coverage for web access
- Low Accuracy of mobile device GPS

The above concerns could be addressed:

- Additional Power Bank for every device
- Intuitive interface design
- Ensure field application has ability to capture store data offline until network coverage is sufficient to upload data to server
- Ability to pinpoint location on aerial image backdrop with supporting photos and back office review of points and photos captured ensures sufficient location accuracy for PoC captured.

The reality is that a <10m accuracy is not needed for a project like this. For planning purposes, the captured location is more than sufficient. (At detailed planning phase most utilities will do a site visit for detailed measurements). When an employee is routed to the site the GPS used by the employee will most likely not be a sub meter accurate GPS implying that he/she is routed to within a ~20m radius of the site. When at location, supported by a photograph of the premise and customer contact details, the person will be able to locate the PoC.



4.4 1st Quality Assurance

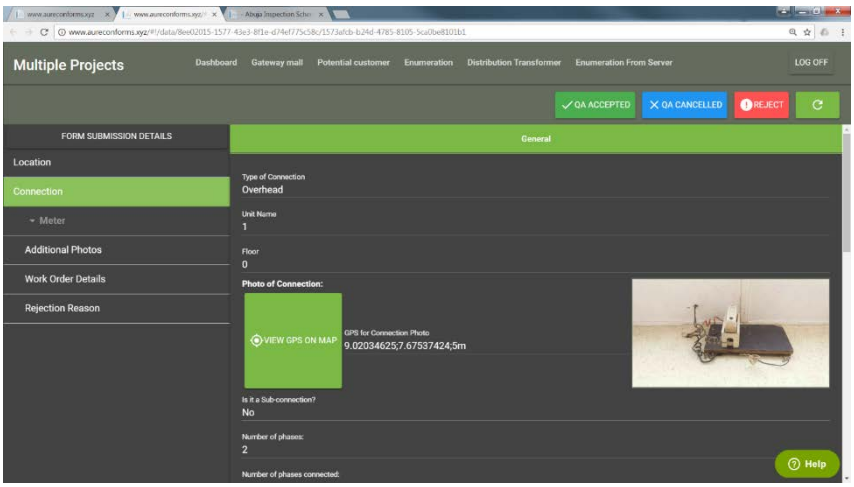
The logistical burden of managing field teams to different areas to record PoC and customer data made it essential that the data recorded is complete and sufficient to support the remaining project processes. As such, if any data quality issues were identified, it had to be done while the field teams are still in that area of capture. It is also imperative that the responsibility for data collection for a PoC remained with the field team that recorded the data the first time. This ensured that field teams in general placed emphasis on capturing the correct and complete data the first time. Rejections from the back office is a nuisance that they know they can avoid if capturing the data correctly.

As such a process was established through which the data underwent a quick quality assurance review to accept the data submitted by the field teams. While the mobile field application could do basic quality checks such as compulsory fields, dropdown lists etc, a basic quality assurance check by back office

data operators had to be introduced to evaluate those quality criteria that could not be embedded into the field application such as:

- Relevant photographs (i.e. premise, building, PoC, meter) taken and in focus
- Review of confirmed location compared to geotagged photo locations
- Comments captured that makes sense. Supplementary information that makes sense.

The solution that addressed the requirement for a quick turn-around time was a web-based application to which all field records were immediately uploaded when the mobile device was within an area with data coverage. An uploaded record was immediately available for back office review through a web application with the same layout as that of the mobile devices. Back office data technicians were assigned field teams for which they had to do initial QA. Rejected records received a comment regarding the reason for rejection and was immediately pushed to the phone from which the record was submitted ensuring the correct field team received the feedback requesting additional data/re-capturing.



Data that passed the initial QA could be processed in the follow-on applications to create work instructions per PoC.

4.5 Work Specification

Data accepted from the field passed to a detailed review where back office personnel completed a detail review of the received data with the intent of developing work specifications for every PoC captured. This had to include a comparison with the utility vending and billing systems to determine if a customer already exist and to create the captured customer PoC link.

Different categories of job cards were created for every audited PoC based on the findings for that PoC. The most common job card categories include:

- **Survey complete**: This job card contained the data captured for the PoC. It also indicated the account number and/or meter number linked to the PoC. Utility personnel used the job cards to update relevant survey data into the billing and vending systems. (Latitude & Longitude, Customer details, address details etc.). While it would have been possible to automate these updates, the utility opted for a manual update through its own personnel.
- **New Customer Job Card:** These job cards were created where the data review found that a new customer had to be created. This could be due to various reason including real new customers, shared accounts. This job card was to create a new customer into the utility systems.

- **Revenue Team Investigation**: In most cases where new customers were identified, a revenue investigation job card was created. This was for the utility to investigate the new customer to determine any violations and if back billing or fines could be instituted.
- **Request for meter:** As most utility customers were unmetered, a specific request for meter installation job card was created that would be used to manage a mass meter roll-out project.
- **Technical Follow-up:** A job card created where the installation is dangerous or specific comments was received regarding the supply (low voltage, no supply for long period, etc.)

New Record Job card			
Id:	**21320**	**Enum Number:**	**12620**
Related Job Cards:	21304 - Enumeration; 21321 - RT Investigation Job card; 21322 - RT Action Job card		
Location			
Billing Customer:	TRUE	Vending Customer:	FALSE
State:		Region:	FCT SOUTH
Area Office:	LUGBE	Service Center:	LUGBE TUDUN WADA
Street Name:	BESIDE ROCK OF CHRIST	Street Number:	
Premise Name:	BESIDE RESTORATION	Premise Category:	
Premise Type:		Building Name /	
Unit Name:	0	Floor:	1
Linked POC No (Vending):		Linked POC No (Billing):	
Lat:	9.000800262	Long:	7.368466498

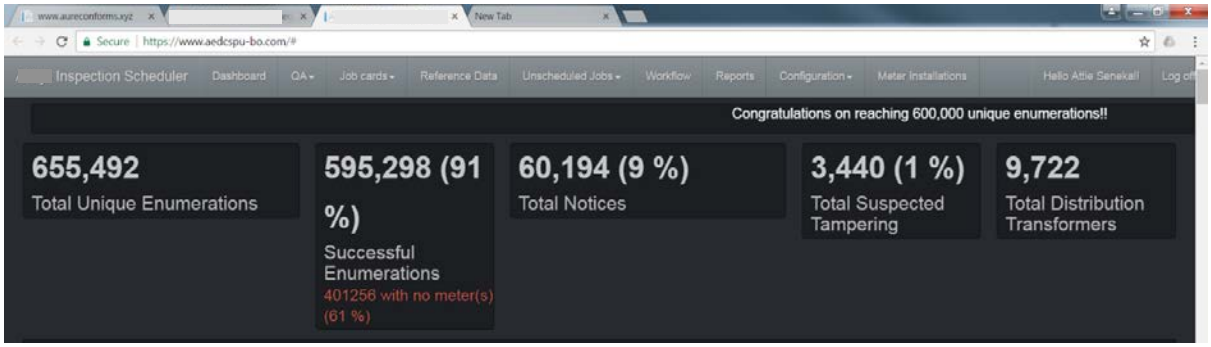
Connection			
# Phases	1	# Phases Connected	1
Supply TRF Name:	OPEN FIELD S/S	Connection Type:	Overhead
Feed Number:	3	Pole Number:	8
Connection Billing Type	Un-metered		

Account			
Occupant Name:	NIL	Occupant Surname:	NIL
Occupant ID Number:	NIL	Occupant ID Type:	Unknown
Contact Mobile:	NIL	Contact Landline:	NIL
Contact Other:	NIL	Contact Email:	NIL
Gen Kva:	5.5	AEDC Customer?	TRUE
Occupant Role:	LANDLORD	Account Name:	ABDUL AZEEZ TIJANI
Account Number:		# Occupants:	1
Shared Account?	FALSE		
Existing Tariff:	R2	Recommended Tariff:	R2
Linked Account ID (Vending):		Linked Customer ID (Vending):	
Linked Account ID (Billing):		Linked Customer ID (Billing):	

4.6 Project Dashboard

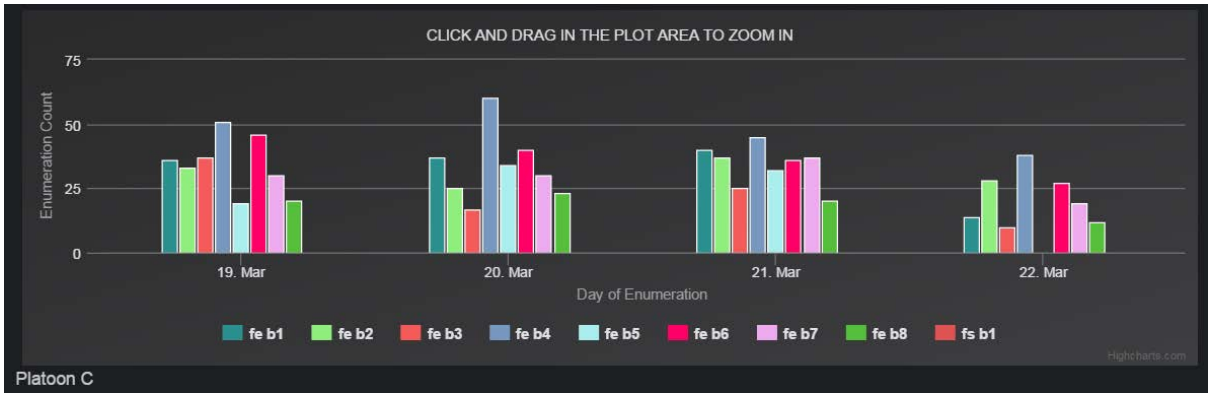
The web-based approach to the project ensured a single common integrated database underlying the exercise. As such it was relatively simple to deploy different dashboards to inform management as well as enable detailed project tracking and management.

For management purposes key project indicators were reported on in the dashboard including total PoC's captured, revisits to complete, unmetered installations etc.



For the technical team the dashboards provided real time information of data submitted by field teams. This allowed the project management team and field supervisors to quickly identify issues that could immediately be taken up with the relevant field teams. Again, it is imperative that the management dashboards show real time data to ensure its usefulness in tracking field work.

In below graph from the dashboard a field supervisor could see the assigned field team performance for the week. In the picture the performance per field team per day is shown.

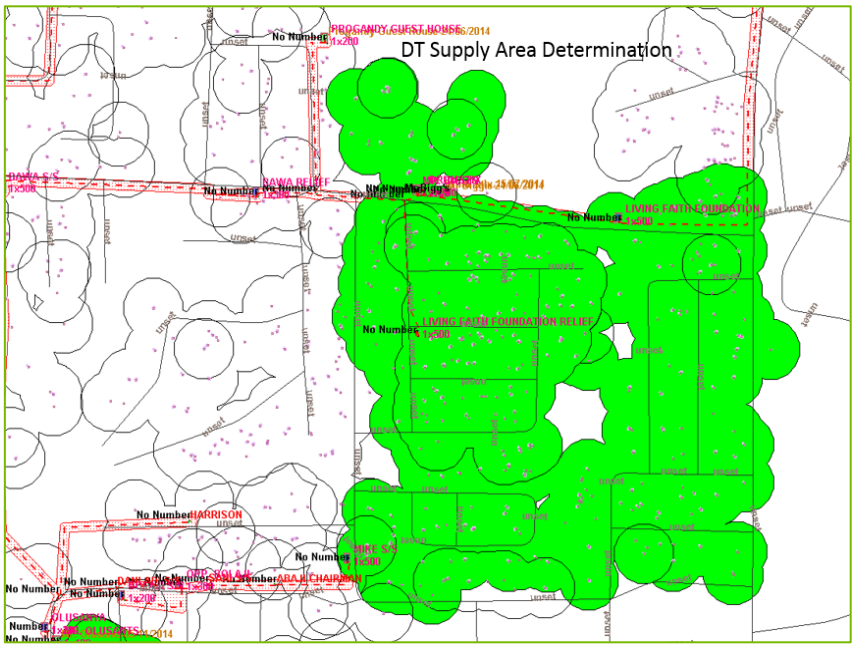


4.7 Spatial Modelling

While the field data collection purpose was achieved through above mentioned systems, a valuable final data enhancement and quality check was introduced to also assess the submitted points in relation to each other – while the prior QA checks had to do with individual records submitted, the spatial modelling allowed a quality assurance perspective of how the points relate to each other. This view specifically allowed the team to:

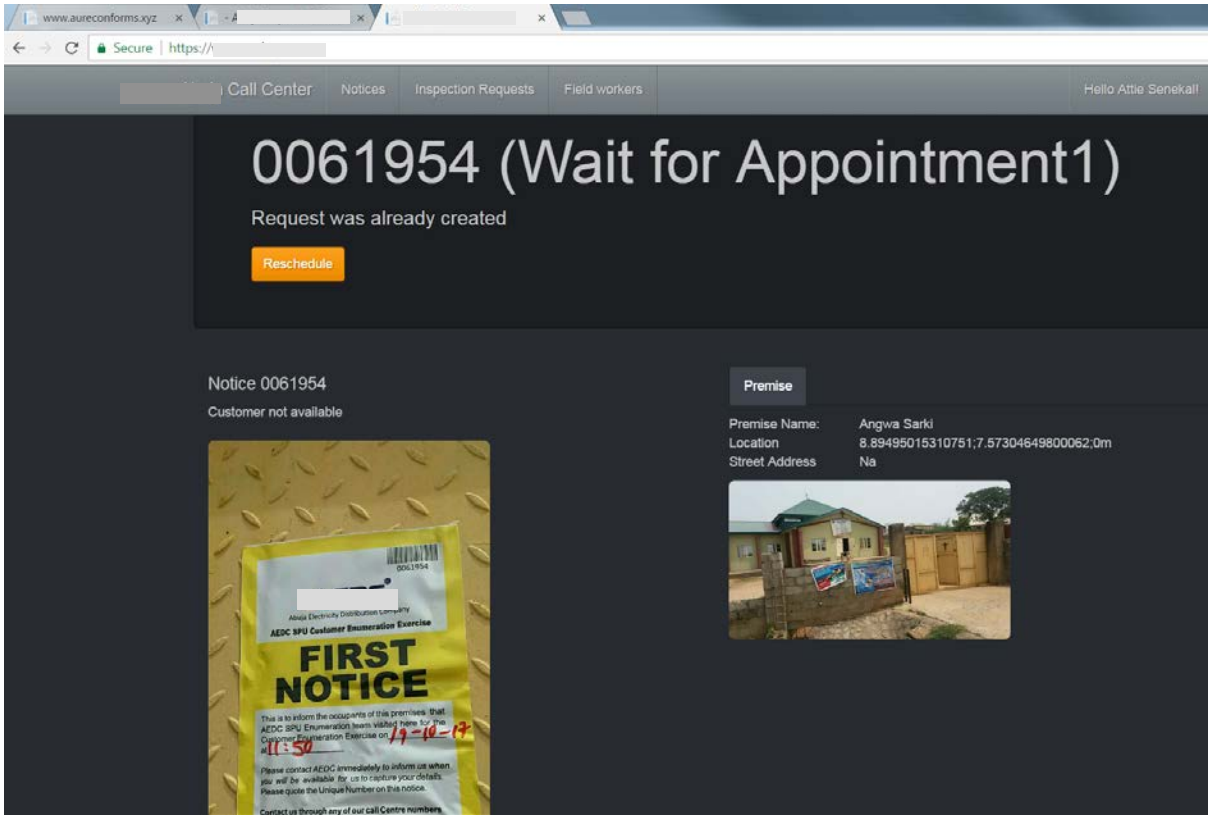
- Identify consumers missed during the field audit – identify structures from aerial imagery where networks are present, but no survey data received
- Identify incorrect CNL captured in field – PoC's were captured including the supplying MV/LV transformer. A spatial view of all PoC's linked to a MV/LV transformer highlighted incorrect data capture. In most instances these data issues could be corrected in the office without a field revisit (using photographs of transformers).

The figure below is an example of a spatially reviewed collection of PoC's all feeding from the same MV/LV transformer. The PoC are simply buffered to create a larger green circle to support visualisation for desk top review.



4.8 Call Centre

Although an integrated call centre application does not normally come to mind when thinking of an enumeration it has proven to be an essential consideration to contribute to the project success. Depending on the prior customer engagement in an area the project encountered no access sites ranging from 10-15% of all sites visited in an area. In these cases, a uniquely numbered notice was left with customers asking them to call the call centre to arrange for a revisit. The call centre could review initial data captured by the field teams to ensure correct scheduling of revisits. In below example a customer phoned the call centre citing notice number 61954. The call centre operator recalled the data captured for that location and could confirm the



5 Summary Project Results

The project is ongoing and projected to complete by December 2018. The output of the project has shown significant findings which if addressed will have a significant impact on the utility non-technical loss reduction. The relevant key statistics to date are described below.

Total Point-of-Connections Identified

At the time of this paper preparation the project has identified 903,120 point-of-connections of which 5% still requires revisits to complete the data capture.

Shared Accounts

Approximately 290,000 point-of-connections (PoC's) were identified where customers shared accounts. In this group only 98,804 accounts were unique – an average of 3 customers shared a single account. Apart from the primary (valid) account holder, this implies close to 200,000 potential new customers to be added to the utility systems. Most of these PoC's falls within the residential classification with residential type consumption but the sheer number of new customers makes this a significant loss component that can be addressed by the utility.

Unmetered customers

Only one third (33%) of all PoC's enumerated were metered which emphasize the significant challenge the utility has to ensure consumption is billed correctly and increase customer willingness to pay.

Tariff Changes

The project identified more than 15,000 accounts that was billed at incorrect tariffs. In many instances the tariff loaded was the lowest residential tariff, while the customer should have been billed at a commercial or industrial tariff.

Other

Apart from the listed categories, many other instances relating to under recovery or no recovery at all were recorded and send for processing. These included evidence of hand written accounts (~15,000) and customers stating that they pay the marketer directly (~500).

6 Key Take-Aways/Lessons Learned

Role of systems

The effort required to field capture all utility PoC's in a clean slate approach is a significant exercise involving hundreds of field resources, back office personnel and significant data management. Well-designed systems can be a crucial component of ensuring project success – data processes must support quick quality assurance turn-around and systems must support real-time project monitoring and management. Although systems in itself do not ensure success, it goes a long way in enabling project teams and leadership to execute a successful project with high data integrity.

Maximise Value

In exercises that involve such detailed field coverage of the utility geographical footprint, the utility should consider including other aspects that could add value outside specific project scope. In this specific case study the addition of basic network data capturing proofed to be very valuable, but even more could have been achieved had the network capturing received more focus. As an example every MV/LV transformer location was visited to ensure the project could capture PoC's in relation to the transformer supplying the PoC. MV/LV transformer locations were not labelled which made a unique reference point impossible – as such the project started to number transformer locations for the purpose of the project. Has this been identified as a shortcoming at the onset of the project, it would have been possible to agree on a numbering approach and proper durable labelling for every site that could have become an anchoring point for these asset locations in all of the utility systems.

Importance of Quality Assurance and Data Governance

Do not only place emphasis on field work, back office data review and enhancement is essential. At the onset of the project thousands of records were rejected per week – this quickly improved. Had it not been for the back-office Quality Assurance process, the project would have continued with poor data which when discovered much later can only be addressed at significant additional cost.

Quality assurance should be all inclusive in terms of attributes, photographs and spatial data. It should include individual record review as well combined data review to ensure high quality information.

Value of photo's

Taking geotagged photographs of site work, connections, meters, account, etc. has proven to be invaluable. In many cases data captured has been queried by utility teams. Having access to photographs to proof what was found on site or to review data captured did away for the need to return to site to confirm data. Storage is no longer an expensive commodity – the value of having a visual representation of what was encountered on site far outweighs the cost of storing and managing photo's.

Mobile phone technology ideal for project

The use of mobile phones as field data collection devices proved to be a very effective and low-cost solution. Most concerns raised at the onset of the project nether materialised or could be managed. The mobile phones enabled easy application access and updates through the Android Play Store. Data management between the phones and the back office was managed through standard web-based technology – records captured in the field was delivered (no record/data loss). The phones assisted GPS technology proofed to be more than sufficient for the project requirements to capture locations. Mapping technology on the phones is easily accessible and used by the project applications. The high-resolution camera's available in modern day mobile phones makes photographs clear and legible.

Web based approach

In a web-based environment, the field teams, back office data teams, call centre, project management and other project resources and can be thousands of miles apart – proximity to field work is not required. This allow the utility to capitalise on existing back office infrastructure. The value of providing a real-time view on progress and data was immense and developed trust – the project did not deliver management reports based on unseen data. Anyone with system access could on a daily basis see overall progress and delve into the specific detail underlying those numbers.

Fixed site reference

For every unique point captured in the project a unique fixed site reference should be created and used throughout the object life cycle. This should preferably be a numeric value as alphanumeric names are more easily captured incorrectly (misspelled, abbreviation used etc.). All PoC's identified in the project got a unique PoC number that is now taken into the utility systems. For distribution transformers the project started using the names provided by the utility technical personnel – this quickly showed to be ineffective as names were duplicated, field teams misspelled names or used abbreviations. The back office had a tough task to consolidate data received relating to the same distribution transformer. As such a decision was made to issue unique numbers to all transformers in addition to the known name. The unique numbers simplified data consolidation and enhanced data integrity.

Sensitisation

Prior customer sensitisation is extremely important – revisits are expensive and requires special logistical arrangements. Where customer sensitisation has been done well we have had less than 10% no access sites. Where not done comprehensively no access sites have increased as high as 20% of sites visited.

Point of Connection

The PoC is the centre of the utility revenue universe. If a utility maintains a spatial database of all PoC's, this data can always be queried to determine when last a PoC has been billed or purchased energy. The relationship between a PoC, the customer, address and meter can be maintained in these specific systems, but to have the ability to know that you have a point of connection that is not billed provides you the foundation for follow-up. In traditional billing systems it has just been too easy to set a customer as inactive accepting that the customer has moved. Having a PoC database will ensure a query is raised if that PoC has become dormant in terms of billing. Even for prepaid customers, PoC information adds value to enable follow-up work. For many years utilities installed pre-paid meters with little concern on its location – this has proven to be problematic as a utility may now detect a significant change in purchases or even no purchases at all, but do not know where to go to inspect that customer/meter.

Customer Network Link

In areas with overhead networks it is very easy to record a customer-network-link during the project which adds value beyond only revenue improvement. (Outage management, Distribution management, network planning, etc.)

Do not only plan for the project - plan to respond to findings

The project field captured and assessed hundreds of thousands of PoC's on the network. A variety of work instructions could be prepared per PoC (request for meter, new customer, tamper investigation, data update, etc.). While a utility can outsource such a field capture project as it is not part of normal operations, the corrective actions identified is normally managed through the internal utility systems and business processes. The amount of work instructions generated is virtually impossible for the utility to manage with its normal compliment of staff. The utility must make special arrangements to ensure implementation of findings to unlock the true value of the project.