

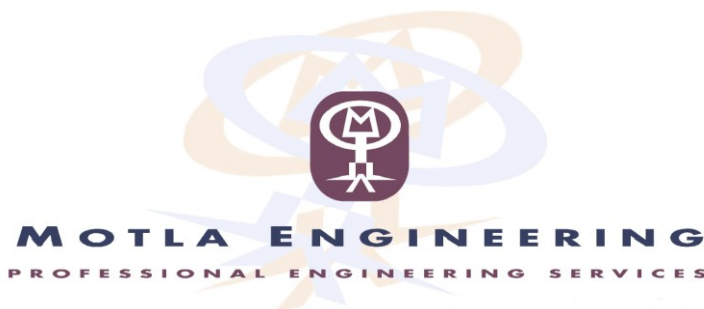
USING TECHNOLOGY TO IMPROVE REVENUE

SARPA CONVENTION

CAPE TOWN

2009

Paper by: JH Götze Pr.Eng



Lyttletown Office Park, Shelanti Avenue, Centurion, 0157
PO Box 10914, Centurion, 0046
Tel: +27 (0)86 136 6852
Fax: +27 (0)86 624 9915
Email: centurion@motla.co.za

USING TECHNOLOGY TO INCREASE YOUR REVENUE FOR SARPA CONVENTION 2009

TABLE OF CONTENTS

TABLE OF CONTENTS	2
1. INTRODUCTION.....	3
2. IDENTIFYING THE PROBLEM.....	3
2.1 INACCURACY OF FINANCE DATABASES	3
2.1.1 <i>New data</i>	3
2.1.2 <i>Comprehensive data</i>	3
2.1.3 <i>Meter replacements</i>	3
2.1.4 <i>Meter duplications</i>	3
2.1.5 <i>Meter numbers</i>	3
2.1.6 <i>Address information</i>	3
2.1.7 <i>Meter factors</i>	3
2.2 OWNERSHIP OF THE DATABASE	3
2.3 COMMUNICATION	4
2.4 INADEQUATE PROCESSES	4
2.5 NO CENTRALISED MANAGEMENT	4
2.6 ACCOUNTABILITY	4
2.7 NO SYSTEM INTEGRATION	4
2.8 FINANCIAL WORKAROUNDS	4
2.9 TRAINING.....	4
3. CONSEQUENCES	4
4. REAL LIFE EXAMPLE	4
5. THE SOLUTION.....	5
5.1 AUDIT DATA.....	5
5.1.1 <i>Field Audit</i>	5
5.1.2 <i>Apply audit to database</i>	5
5.1.3 <i>Link data to GIS system</i>	5
5.2 APPLY TECHNOLOGY TO MAINTAIN DATA	5
5.2.1 <i>Technology 1: GPS</i>	5
5.2.2 <i>Technology 2: RFID tags</i>	5
5.2.3 <i>Technology 3: Workflow</i>	5
5.2.4 <i>Technology 4: Sealing strategy</i>	6
5.2.5 <i>Technology 5: Internet</i>	6
6. INVESTMENT.....	6
7. CONCLUSION	6

USING TECHNOLOGY TO INCREASE YOUR REVENUE FOR SARPA CONVENTION 2009

1. INTRODUCTION

Motla Engineering has vast experience in the metering industry reading currently more than 1,1 million meters per month and having audited millions more.

This paper is aimed at sharing our experience and to make municipal officials aware of the financial crippling problem we encountered at several municipalities.

We believe also that we have the solution. A solution that can be implemented by municipalities using internal resources with technology available off the shelf.

2. IDENTIFYING THE PROBLEM

2.1 Inaccuracy of finance databases

The main reason why not only accurate meter reading, but meter reading it self is made very difficult is the inaccurate data provided to meter readers. The data is almost always inaccurate with inaccurate addresses, wrong meters linked to the address, inaccurate GIS information, incorrect previous readings and history to mention a few.

If meters are read incorrectly then billing will not be accurate and in turn revenue will be lost.

The following are some reasons why data is not accurate.

2.1.1 **New data**

The finance department are not informed of new connections by other departments and not given the data to upload.

2.1.2 **Comprehensive data**

Data are almost always lacking some of the information. Almost nowhere will you find a telephone number for the owner. A telephone number will make life much easier for the meter reader when he cannot get access.

2.1.3 **Meter replacements**

Meter replacement processes are mostly nonexistent and therefore after a meter is replaced the data is not updated

2.1.4 **Meter duplications**

For every meter duplicated there is bound to be a meter not registered on the database. Therefore a meter not read.

2.1.5 **Meter numbers**

If a meter number is incorrect, then the meter reader does not know if he/she is reading the correct meter, as meter numbers are the most commonly used method to identify a meter.

2.1.6 **Address information**

If the address of the meter is not known then the meter cannot be allocated to a route and will most definitely not be read.

2.1.7 **Meter factors**

Meter factors are essential as the error is multiplication error if the factor is not correct. This does not influence the meter reading process, but certainly influences the consumption and revenue figures.

2.2 Ownership of the database

The ownership of the meter lies with the Infrastructure Services (IS) departments, yet the owner of the data of the meter and data associated with the meter is the Finance

department. Somehow this does not make sense. A Revenue Protection department which is sadly lacking at most municipalities would be a more suitable owner. For now perhaps the IS department should have ownership?

2.3 **Communication**

Communication between departments is the biggest contributing factor influencing data integrity. No formal communication structures are in place.

2.4 **Inadequate Processes**

No formalised processes exist to update data such as new connections or meter replacements.

2.5 **No Centralised Management**

The data is manipulated by any person who decides to do so at any time. No proper central management of the access to the data or the manipulation thereof is in place.

2.6 **Accountability**

As a result of no central management strategy no one is accountable for the data. Some one must be accountable if the problem is going to be solved.

2.7 **No System Integration**

All departments have their own systems in place and none of those are integrated. You will find that in some instances several databases will be used in one municipality. An integrated system will ensure one database is used with less overheads and other associated costs and problems.

2.8 **Financial Workarounds**

Finance staff will do all sorts of financial workarounds to ensure billing is within budget. This must be stopped and controlled as it will corrupt the data even more and will cause a snowball effect.

2.9 **Training**

Staff are not trained sufficiently to realise the importance of accurate data. If they are made aware of the consequences of inaccurate data they might reconsider workaround tactics they might have.

3. **CONSEQUENCES**

- Bulk purchase reconciliation is impossible
- Inaccurate billing
- Budget constraints due to insufficient billing
- Data integrity degradation
- Bad public perception
- Revenue and loss management is made impossible

4. **REAL LIFE EXAMPLE**

The data below was derived by taking the average of data collected at four completely different municipalities not only in size but also locality and composition of consumers. The data was extrapolated to represent a municipality with 50,000 registered meters:

- 5.23% = 2615 – Incorrect or incomplete information on database.
- 3.44% = 1724 - Meters replaced but not updated on database.
- 9.17% = 4589 - Interim consumption or interim readings used.
- 5.58% = 2790 - Meter stuck or disconnected.
- 1.76% = 880 - New meters not registered in finance database.

This equates to a yearly loss of more than R50 million.
It also shows that more than 25% of the data was manipulated.

5. **THE SOLUTION**

Use technology in the following way

5.1 **Audit data**

5.1.1 **Field Audit**

It does not matter what audit strategy you might have, but you must at least have one. The only way to clean up the data is by auditing the data.

5.1.2 **Apply audit to database**

Ensure you have the infrastructure to handle the data you receive. Have the back office in place, equipped and trained.

5.1.3 **Link data to GIS system**

GIS systems are relatively inexpensive and have become a must when data of this nature is managed.

5.2 **Apply technology to maintain data**

5.2.1 **Technology 1: GPS**

Advantages

- The meters can be found by meter readers and IS staff for maintenance.
- The meter reader can only take a reading if he/she is at the meter. The handheld terminal will not allow a reading to be typed in if the handheld is not within 3 meters of the meter.
- Revenue protection can be managed better with off the shelf software combining GIS and Reading data to show consumption patterns and identifying areas to be audited with unexplained losses.
- Maintenance teams with GPS tracking devices in the vehicles can be monitored to ensure they are at the meter they are supposed to attend to. This will increase productivity.

5.2.2 **Technology 2: RFID tags**

Advantages

- Electronic information of the meter is physically attached to the meter.
- No battery life if passive tags are used.
- Meter information stays with the meter even after it was removed.
- Information such as installation date, stand number, owner information, last reading, last reading date, meter reader name, last maintained, who did maintenance, removal date, reading on removal, meter detail of the meter replacing the meter etc.
- Meter reader will not read the incorrect meter.
- A history is built up and physically connected to the meter.
- Human intervention is limited and therefore human error is limited.
- Can be effectively used with electronic job card systems and work flow systems.
- Control of stock is better manageable.
- Meter replacement processes can be implemented.
- Monthly meter audit processes can be implemented.
- Handheld terminals for contractors on which electronic job cards are issued will upload data from the RFID tags directly to the database. The only human intervention in this process is the capturing of the meter reading.

5.2.3 **Technology 3: Workflow**

Advantages

- Take the human factor out of the equation to a large extent.
- All work instructions traceable and therefore better manageable.
- Communication between departments guaranteed as all will be prompted by this integrated system when one department issues a works order. When IS issue an instruction to replace a meter Finance will be prompted etc.

- No work can be left undone.
- Access can be limited and therefore accountability can be given.
- Central management of data and instructions can be achieved.

5.2.4 **Technology 4: Sealing strategy**

Advantages

- If meters are sealed and the seals bar-coded then the meter reader can scan the seal after checking the seal for physical damage and if the code does not correspond with the original code then it will be reported to the work flow system red flagging possible work on the meter, meter replacement or tampering.
- Seals must have unique numbers and the issuing thereof must be captured on the system. This way the responsible person can be identified.
- Meter readers can seal meter boxes every month and scan the seal details onto the database to be checked again next month. Any changes will either red flag a change to the data or tampering then triggering an audit.

5.2.5 **Technology 5: Internet**

Advantages

- The public can suggest changes to the data prompting further confirmation processes to ensure the data and or the proposal is correct.
- The public perception of service delivery will be improved.
- The public can better manage their consumption.
- The public can submit meter readings.
- The public can report problems such as power failures or water leaks.

6. **INVESTMENT**

Real life experience has shown that the rate of return implementing strategies and processes to clean up data and to maintain the data yields a return of 5 to 1. In other words for every one rand spent five rand will be recovered. This is over a short period of a few years depending on the size of the municipality. The initial relative short term cost delivers a long term investment that is not easy to define as you can not calculate what you would have lost if the measures were not in place.

7. **CONCLUSION**

If revenue protection is done at a municipality where the data was not cleaned up and then maintained by processes and procedures incorporating technology then these management decisions are based on only 75% fact and 25% fiction. Engineers are also calculating technical losses based on this fact and fiction. From here the constant arguments on who and what is to blame for losses. Are the losses technical or non technical. Even if you think you know you might be wrong if you do not know the extent of the problem. The only way to find out is to audit the data.

There are solutions. Departments within municipalities need to work together, communicate better and support each other as one team. Technology will help, but not if all are not committed to first clean up the data and then maintaining it. Maintenance is the key.