



User Requirement Specification

**KZN DOT
Zibambele Management System**

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1. Introduction and Management Overview

1.1 Background

The Zibambele Maintenance Programme is a flagship, poverty alleviation Programme initiated by the KwaZulu-Natal Department of Transport and adapted from the Kenyan Lengthman model, using labour intensive methods to maintain sections of rural road, as well as carrying out other maintenance activities.

The Programme contracts a household rather than an individual and focuses on women headed households, which the local communities themselves identify as being most destitute, with a view to providing them with long-term sustainable employment opportunities.

The Programme is in line with Government's Expanded Public Works Programme which aims to draw significant numbers of unemployed into productive work, accompanied by training, to enable them to increase their capacity to earn an income in the future.

Since its initiation in 1999, the Zibambele Programme has always been managed manually. It was started with only 1200 contractors who were employed; today the programme has employed more than 40,000 contractors.

The challenge faced when monitoring performance of contractors is that it is done manually where Field Support Officers have to go out onsite to check and record performance; these paper reports are sometimes not filed or not filed correctly. Thus it is not possible for the Department to account for the performance of Zibambele contractors.

Further, The Auditor General's Reports refers to the Zibambele Policy section 7.1 which indicates that it is a requirement of the policy that a centralised Zibambele Information Management be put in place. This Zibambele Management System will address this section. Secondly the data or statistics on Zibambele cannot be properly reported on as there is no common management system. Lastly management is not able to do forward and long-term planning on the programme. For the past three or four years the office of the Auditor General has picked this up as a problem and the Department has to attend to it as a matter of urgency.

The project is a Zibambele Information and Performance Management System. The system should enable paperless performance monitoring on site and enable management to draw

management reports at any given point in time. It should also allow for manipulation of data for planning purposes.

The development of a User Requirements Specification is part of the first phase of the project, which seeks to enable the Department to thereafter acquire a system solution that is closely aligned to business needs.

1.2 Management objectives

Currently there is no common system that exists to manage the Zibambele Programme. The data is captured on MS-Word, MS Access as well as MS-Excel spreadsheets. The information captured is not comprehensive enough, and the format with which it is captured is not suitable for management use. This creates limitations which affects proper planning and management of the programme.

The Zibambele programme within the KwaZulu-Natal Department of Transport is the largest contributor that support EPWP programme within the Department. In order for the Department to claim the incentive grant and FTE's, EPWP require proper planning and auditable records.

In summary, the management objectives are to implement a consolidated system that will be used to manage the Zibambele Programme, whilst provide adequate business intelligence to streamline and optimise the programme, and perform strategic planning.

1.3 System requirements analysis

Discussions were held with the Department of Transport to establish the base needs of the Department.

To meet the needs of the Department an application is required to replace the manual monitoring report and the manual records captured into the MS-Excel spreadsheet. The application should provide at minimum the same information as the Excel spreadsheet, but with the following functional elements:

- i. Database driven;
- ii. Simple and user friendly interface – preferably web-based for operation over the Intranet;
- iii. Data capture and enquiry facilities;
- iv. Functionality to perform end-to-end management of the Zibambele programme;
- v. User registration facility;

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- vi. Reporting facilities;
- vii. Allow for remote capturing of monitoring reports with GPS location logging via a device

1.4 Proposed solution

There are different options which can be used to meet the business requirements documented in this URS. Service providers will be expected to analyse the requirements and propose a solution that can be used to best achieve the requirements.

Possible solution options are:

- i. Development of customised software that meets all requirements; or
- ii. Use off-the-shelf software that is tailored to meet business needs.

2. Objectives

2.1 Business objectives

The Department requires the following objectives to be met through this request:

- i. Proper planning for the Zibambebe Programme;
- ii. Achieving cost savings as the Department will be able to plan properly for tools procurement and allocations;
- iii. Proper monitoring and reporting of Zibambebe figures , based on current data; and
- iv. Proper supervision of contractors.

2.2 System objectives

The system is to meet the business objectives listed above in (2.1) by means of:

- i. Provision of an automated, easy to use interface to manage personal information of stakeholders in the Zibambebe programme;
- ii. Simplify and automate the process of planning for and conducting inspections;
- iii. Transform and simplify the Zibambebe contractor payment reconciliation process (payment and rejection);
- iv. Provide reporting and business intelligence;

2.3 Project objectives

To develop a system within the required time, cost and quality constraints that meets the business objectives.

3. Project scope

3.1 Project Type

This project is a software development project requiring the full software development life cycle (SDLC). The full SDLC must be executed for each of the 3 Phases as described in this URS.

3.2 Project Context

The project should be seen in the context of functions of the KZN DOT Directorate which is responsible for the Zibambele Programme.

The following diagram illustrates the application in relation to its intended users. Users from other Departments or Provinces may be granted access at the discretion of the system owners. The system may also be scaled up to allow for use by other Provinces.

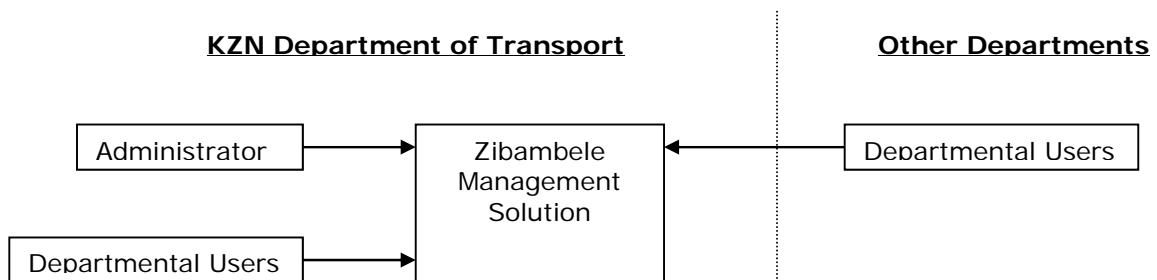


Figure 1: Application Context Diagram

3.3 Assumptions

The following assumptions have been made:

- a) The application will be hosted on KZN DOT server infrastructure in Pietermaritzburg

3.4 Constraints

The following constraints apply to the project:

- a) Budget
- b) Time

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Table with 18 columns (A-RR) and multiple rows. Columns include personal details, location, and administrative fields. Row 3 is highlighted.

Figure 6 – Audit 1 continued – Screen 4

Table with 13 columns (A-M) and multiple rows. Columns include personal details, region, and employment data. Row 17 is highlighted.

Figure 7 – Audit 2– Screen 1

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| 1 | N | O | P | Q | R | S | T | U | V |
|-------------|------------------|----------------|-----------------|----------------------|------------|----------------|----------|------------------------|---|
| Appt Nature | Nature Long Desc | Allowance Code | Allow Long Desc | Allowance Amount | Objective | Responsibility | Program | Program Desc Long | |
| 2 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 3 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 4 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 5 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 6 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 7 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 8 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 9 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 10 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 11 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 12 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 13 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 14 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 15 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 16 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 17 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 18 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 19 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 20 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 21 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 22 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 23 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 24 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 25 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 26 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 27 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 28 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 29 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 30 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 31 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 32 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 33 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 34 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 35 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 36 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 37 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |
| 38 | 52 | | 0401 | ZIBAMBELE CONTRACTOR | 390 426038 | D954 | M0002601 | 2. ROAD INFRASTRUCTURE | |

Figure 8 – Audit 2 continued – Screen 2

| 1 | Method Payment | Account Number | Bank Code | Bank Long Desc | Bank Long Desc | AA | AB | AC | AD | AE | AF | AG |
|----|----------------|----------------|-----------|-------------------------------|-------------------------------|----|----|----|----|----|----|----|
| 2 | 4 | 13420310 | 0104 | ITHALA LIMITED | ITHALA LIMITED | | | | | | | |
| 3 | 4 | 160956218 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 4 | 4 | 160956358 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 5 | 4 | 160956356 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 6 | 4 | 160958321 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 7 | 4 | 160954482 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 8 | 4 | 13629277 | 0104 | ITHALA LIMITED | ITHALA LIMITED | | | | | | | |
| 9 | 4 | 33216913 | 0104 | ITHALA LIMITED | ITHALA LIMITED | | | | | | | |
| 10 | 4 | 13490390 | 0104 | ITHALA LIMITED | ITHALA LIMITED | | | | | | | |
| 11 | 4 | 160956226 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 12 | 4 | 160956234 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 13 | 4 | 160956323 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 14 | 4 | 160955599 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 15 | 4 | 160953340 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 16 | 4 | 160953332 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 17 | 4 | 160953316 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 18 | 4 | 160953308 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 19 | 4 | 160955810 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 20 | 4 | 160956242 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 21 | 4 | 160955572 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 22 | 4 | 160956188 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 23 | 4 | 160955564 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 24 | 4 | 160956307 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 25 | 4 | 160953359 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 26 | 4 | 160957958 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 27 | 4 | 160956927 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 28 | 4 | 160954571 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 29 | 4 | 160954539 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 30 | 4 | 160954547 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 31 | 4 | 160954512 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 32 | 4 | 160958445 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 33 | 4 | 160958518 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 34 | 4 | 160958429 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 35 | 4 | 160958534 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 36 | 4 | 160958402 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 37 | 4 | 160958836 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |
| 38 | 4 | 160958892 | 0001 | STANDARD BANK OF S.A. LIMITED | STANDARD BANK OF S.A. LIMITED | | | | | | | |

Figure 9 – Audit 2 continued – Screen 3

An MS-Access based system has also been used to track information on Zibambele and provide certain reports. Selected screenshots are provided below to show the functionality which exists in the MS-Access system.

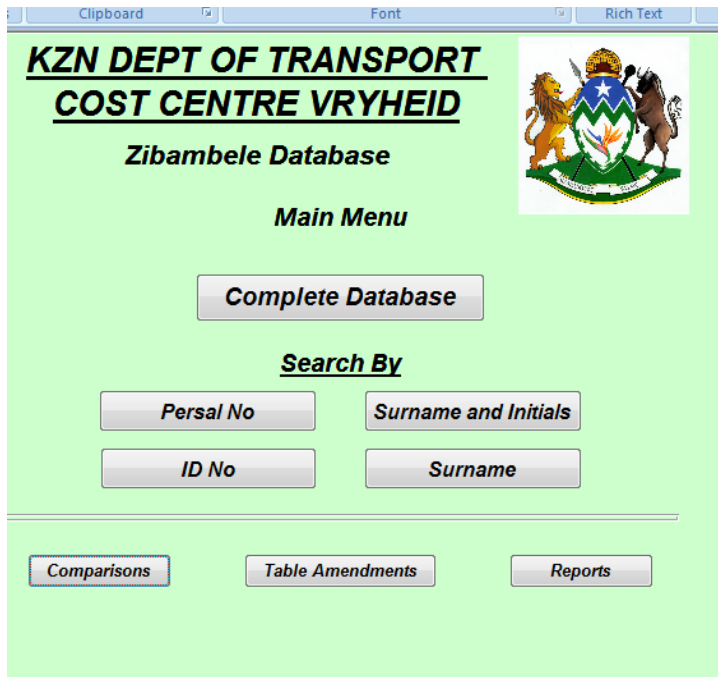


Figure 10 – Zibambele MS-Access Main Menu

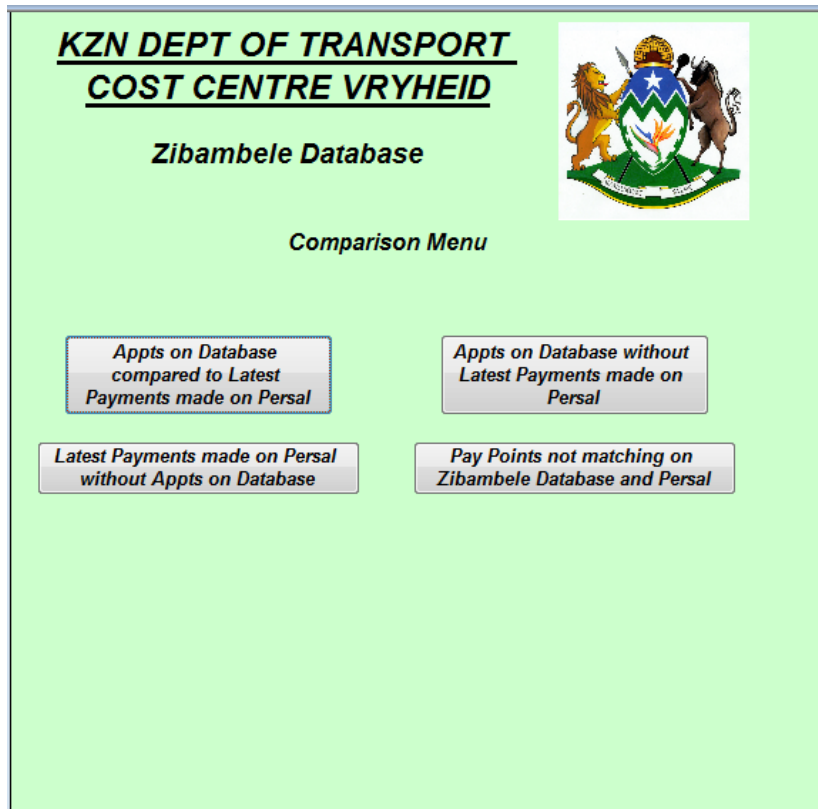


Figure 11 – Comparisons Menu

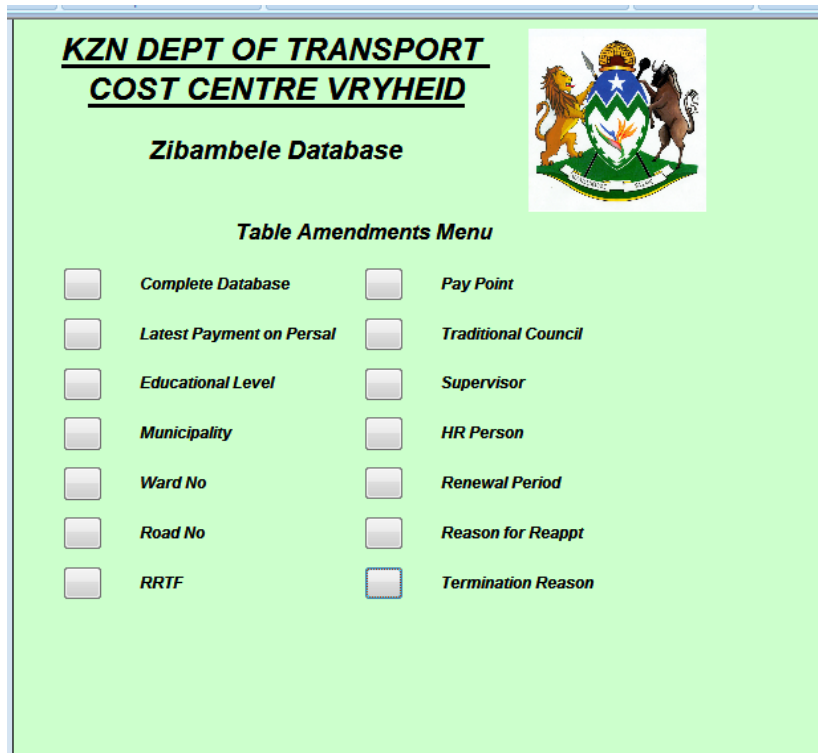


Figure 12 – Data Management menu – Including Meta data management

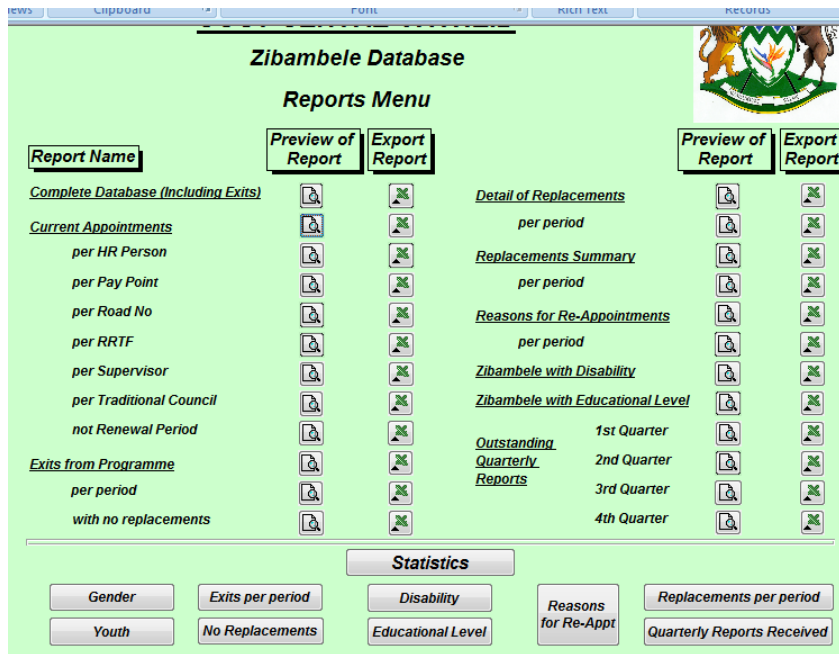


Figure 13 – Detail and summary reports

4.1.1 Strengths

No strengths can be identified in the manual system which cannot be translated into the automated solution.

4.1.2 Weaknesses

The following elements may be seen as weaknesses in a manual register:

- a) Data is captured and maintained in Excel spreadsheets;
- b) Inspections information is filed manually, and sometimes not filed at all;
- c) Undertaking searches or enquiries is laborious and time consuming;
- d) The current process is laborious, tedious and time consuming.
- e) It is difficult to share information with stakeholders;
- f) It is difficult to make real-time decisions or forward planning.
- g) There is no proof that supervisors/monitors visited the site in order to complete the monitoring report.

5. New system requirements

5.1 Functional requirements overview

The Use Case Diagram in Figure 10 summarises the functional requirements of the DOT Zibambe Management Solution.

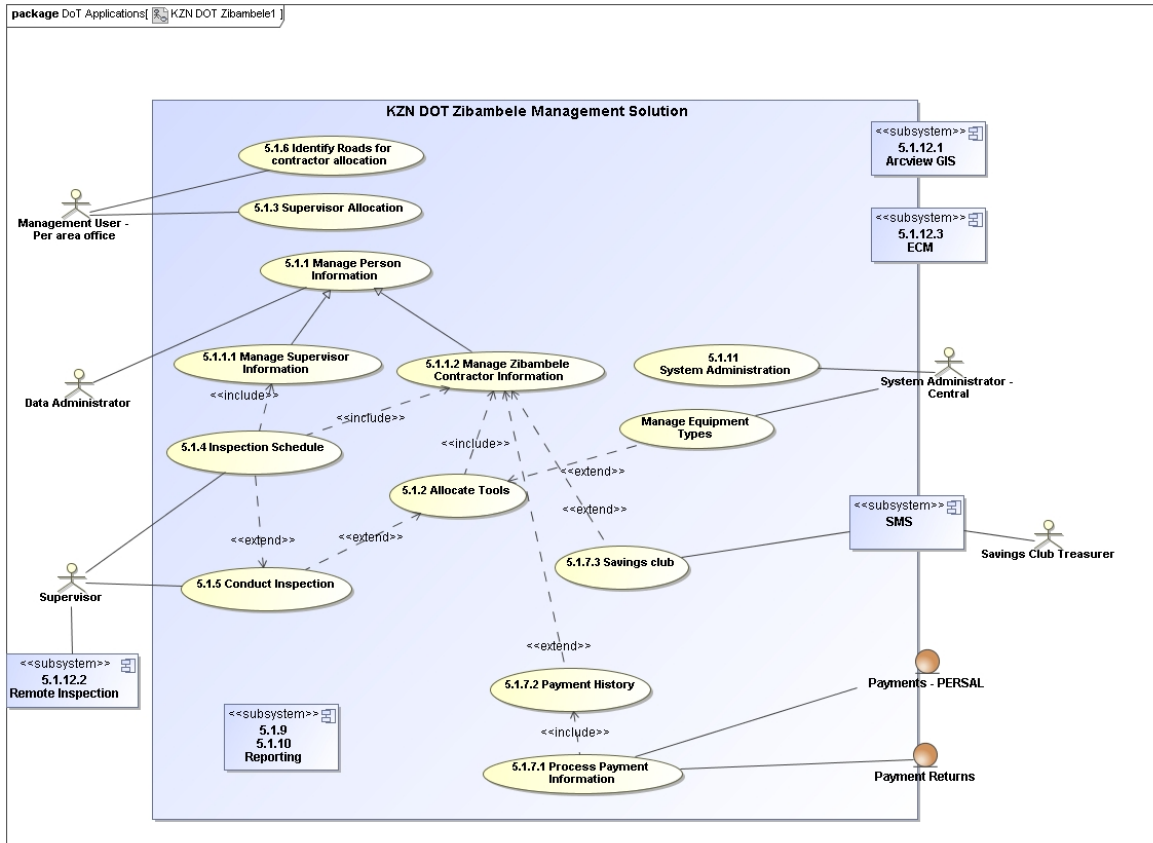


Figure 14: KZN DOT Zibambe Management Solution - Use Case Diagram

For each of the use cases, a detailed description is provided. A summary of the functional requirements and associate reference within this URS is provided in Table 1.

Table 1: Summarised Functionality and associated URS reference

| Functionality & URS Reference | |
|--|---|
| 5.1.1 Manage Person Information | 5.1.1.1 Manage Zibambele Contractor Information |
| | 5.1.1.2 Manage Supervisor Information |
| 5.1.2 Allocate Tools | |
| 5.1.3 Supervisor Allocation | |
| 5.1.4 Inspection Schedule | |
| 5.1.5 Conduct Inspection | |
| 5.1.6 Identify Roads for Contractor Allocation | |
| 5.1.7 Payments | 5.1.7.1 Reconcile Payment Information |
| | 5.1.7.2 Payment History |
| | |
| 5.1.8 User Administration | |
| 5.1.9 Business Reporting | 5.1.9 i Zibambele Contractor Reports |
| | 5.1.9 ii Tool Register Reports |
| | 5.1.9 iii Zibambele Supervisor Reports |
| | 5.1.9 iv Inspection Reports |
| | 5.1.9 v Roads Allocation Reports |
| | 5.1.9 vi Payment Reports |
| | 5.1.9 vii Training Club Reports |
| | 5.1.9 viii Statistical reports |
| | 5.1.9 ix Home Affairs Reconciliation Report |
| | 5.1.9 x BAS Reconciliation Report |
| 5.1.10 System Audit Reporting | |
| 5.1.11 System Administration | |
| 5.1.12 System Integration | 5.1.12.1 GIS |
| | 5.1.12.2 Remote Inspections |
| | 5.1.12.3 ECM |

The number of system users are estimated as follows:

Table 2: Estimated number of users per user type

| Management User | Data Administrator | Supervisor | System Administrator |
|------------------------|---------------------------|-------------------|-----------------------------|
| 52 | 94 | 379 | 5 |

It must be noted that the numbers above are estimated number of users only and will be subject to confirmation. The users will be spread across the province at a Head Office, Regional Office, Cost Centre and Area office level.

5.1.1 Manage Person Information

5.1.1.1 Manage Zimbabwe Contractor Information

Overview of requirements:

The Department needs to keep track of the approximately 40 000 Zimbabwe contractors in the province. This number is likely to grow over time. As such the management of Zimbabwe Contractor Information is a key requirement of the system.

This information will be critical in operational and management decision-making. Once the data has been captured, adequate data governance must be applied to ensure that the data quality is maintained. There are approximately 94 data administrators who will be responsible to capture and maintain this data i.e. 25 office, 2 data administrators per office.

The high level data classes are provided below whilst Appendix B provides a more detailed description of the proposed data requirements. These are indicative data requirements only which must be confirmed during the design phase; further the system must be configurable to allow for additional data fields to be easily added onto forms without necessitating code changes.

- i. Personal Information (including education, dependants, contact details, address);
- ii. Means Test
- iii. Banking Information;
- iv. Roads Allocation Information (including historical information);
- v. Photograph of contractor;
- vi. Savings Club information;
- vii. Contract documentation;

Overview of system functions:

The following system functions are required:

- i. Conduct the Means Test
- ii. Add new contractor with bank account and ID;
- iii. Add contractor awaiting bank account or ID;
- iv. Update contractor information;
- v. Upload document to contractor's profile;
- vi. Search for contractor;
- vii. Report on historic contractor allocation.

5.1.1.2 Manage Supervisor Information

Overview of requirements:

The supervisor monitors and reports on performance of Zibambele contractors. Each Zibambele contractor is assigned to one supervisor at a given time, whilst a supervisor will supervise many contractors. There are currently approximately 120 supervisors.

It is necessary to record personal information of a supervisor.

Overview of system functions:

The following system functions are required:

- i. Add new supervisor;
- ii. Update supervisor information;
- iii. Upload document to supervisor's profile;
- iv. Search for supervisor;

5.1.2 Allocate Tools

Overview of requirements:

Zibambele contractors are allocated tools which they require to complete their work. Examples of tools include cones, slashers, wheelbarrows etc. The possible types of tools will be maintained as a catalogue or lookup, and this catalogue will be maintained by the system administrator.

There is a need to capture the baseline tools which are already allocated to Zibambele contractors. Further as a tool becomes worn, a new tool needs to be requested. The request will be automatically triggered based on the feedback from the supervisor's inspection (see 5.1.5) and such requests must be maintained in the Zibambele Management Solution. This tool usually will be issued to the contractor by the supervisor, the next time the supervisor conducts an inspection. A record must be kept indicating the details of the new tool that was issued to the contractor i.e. type of tool, date issued, who issued the tool.

It is vital that historical information regarding the issue of tools is maintained in the form of a Tools Register. The allocation of tools and requests for tools for specific contractors should be accessible through the contractor's profile. It should also be possible to view tools allocated and requested based on specific input parameters e.g. type of tools, area/regional office, supervisor, age of tools etc.;

The Tools Register will be populated en-masse at go-live when the initial data is populated in the system. Thereafter the Tools allocation and requests are updated per contractor as applicable.

Overview of system functions:

The following system functions are required:

- i. Automatically trigger request for tool based on feedback from supervisor inspection (see 5.1.5). Zibambe Management Solution;
- ii. Allow for manually capturing tool requests, or modifying and cancelling existing tool requests; the system is to issue a reminder where tools have been requested and not issued (possibly every time an user logged on and record the users response before allowing access to other system function), Tools reminders should be report as automatic pop-ups to various managers, a history need to maintained of all pop-ups issued and response recorded.
- iii. The system should be able reconciliation of tools from dispatching through issuing to contractors, to ensure that all tools are accounted for.
- iv. Allow capture of records of the tool requests for which orders have been generated and currently in SCM/supplier processes;
- v. Allow capture of records of tool requests for which tools have been received (i.e. SCM process has concluded) however not yet issued to Zibambe Contractor;
- vi. Allocate tool to a contractor (this could be a first time issue or re-issue). This occurs when the supervisor hands the tool over to the contractor;
- vii. Allow tools to be allocated to a contractor (the tools will or will not have a unique identifier – the system is to cater for the allocation of tools related to this.
- viii.
- ix. Tool Register:
 - a. View all tools that have been requested and no orders have been placed;
 - b. View all tools that have been requested and not yet obtained (request still being processed by SCM or supplier);

- c. View all tools that have been requested, obtained and not yet issued to the contractor (obtained by asset management, waiting in storeroom until the supervisor next visits contractor);
- d. View all tools that have been received and issued;
- e. View tool allocations and tool requests based on specific input parameters;
- f. View tool allocations and tool requests for specific contractors;

5.1.3 Supervisor Allocation

Overview of requirements:

Each supervisor is allocated to a number of Zibambele contractors, whilst a Zibambele contractor is allocated to one supervisor at a given time. This allocation is performed by a Management User at the Area Office. As the allocation of supervisor can change over time, the history of the supervisor allocation must be maintained.

The initial allocation of supervisor to contractor will be done en-masse when the initial data is populated in the system. Thereafter the supervisor allocation is updated per contractor where applicable.

Overview of system functions:

The following system functions are required:

- i. Update supervisor allocation; This is done at the contractor level, and should allow searching of supervisors based on criteria input by the user.

5.1.4 Inspection Schedule

Overview of requirements:

A supervisor must be able to draw a schedule of the contractors that should be inspected based on the criteria input by the supervisor.

Overview of system functions:

The following system functions are required:

Draw inspection schedule based on:

- i. Number of months since last inspection (supervisor enters value for number of months parameter);
- ii. Contractors for inspection based on road or area;
- iii. Combinations thereof.

The solution must make provision for:

- i. Drawing an inspection schedule from anywhere at any time (e.g. through a mobile or web interface). This must cater for situations where mobile network access is adequate; and
- ii. Draw a schedule whilst connected to the DoT network, download schedule to a device and work offline. This must cater for situations where mobile network access proves challenging.

5.1.5 Conduct Inspection

Overview of requirements:

A supervisor visits a contractor and will conduct an inspection of the contractor's work performance. The details of the inspection must be recorded in the system. If the performance is inadequate then the supervisor will issue a warning to the contractor. The warning must have an active period e.g. 'y' number of months from date of issue. 'Y' must be a system parameter controlled by the System Administrator. The supervisor may also make recommendations for types of interventions needed (e.g. training).

If the contractor has 'x' number of active warnings at any given time, then the contractor is suspended and payment processing is halted. 'X' must be a system parameter controlled by the System Administrator.

After suspension, the contractor may be dismissed in which case the contractor's profile must be updated by the supervisor to indicate such. Alternatively a suspension may be overturned by the supervisor and the system must allow the supervisor to perform this action. A record must be kept against the contractor's profile.

Figure 11 provides an overview of the inspection process in the context of the complete business process for Zibambele:

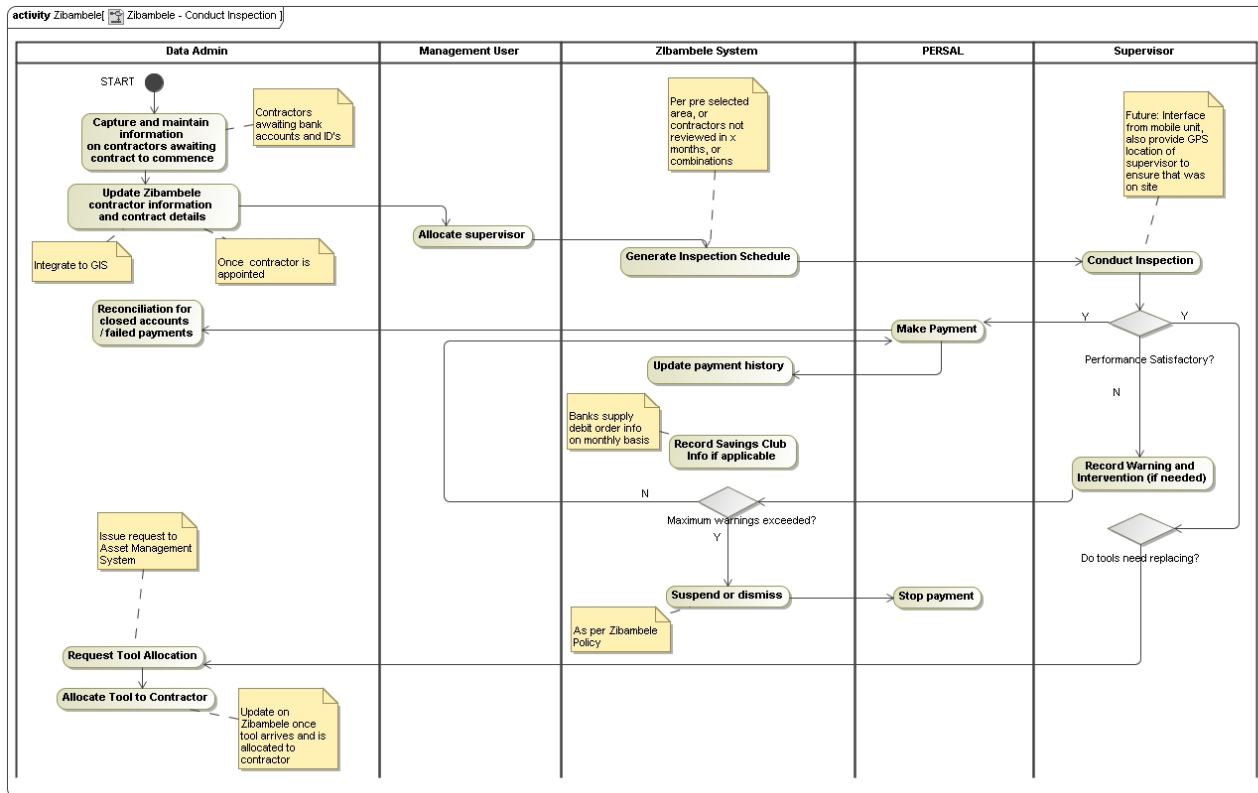


Figure 15 : KZN DOT Zibambele – Zibambele Business Process

Overview of system functions:

The following system functions are required:

- i. Capture inspection outcomes after the supervisor has conducted an inspection. There must be provision for online capture of inspections as well as offline capture of inspections. The inspection should cater for attendance and performance monitoring. In particular:
 - a. Using a device, allow a supervisor to access the contractor's profile in real-time and capture an inspection record from anywhere at any time through a mobile network connection. The system is updated dynamically with the data;
 - b. Should the device be unable to connect to make a suitable connection to the network or to the system, allow the supervisor to capture the inspection record on the device? When the supervisor returns to the KZN DoT office and is able to make a suitable network and system connection, then s/he can upload all offline inspection records into the system.
 - c. The device must log the GPS location where the Inspection report is completed.

- d. The device must not allow an inspection to be conducted further than 500m from the allocated road section for the specific contractor
- ii. The system must reconcile daily, monthly and quarterly contractor attendance and performance.
- iii. The system should record stand-ins and related information, as per the Zimbabwe policy,
- iv. Issue warning to contractor if performance is unsatisfactory;
- v. Capture intervention related to warning if applicable;
- vi. Suspend contractor – the system should automatically place a contractor on suspension if the maximum number of active warnings is exceeded; The active period of warnings and maximum number of allowed active warnings must be parameter driven;
- vii. Dismiss contractor – after suspension a supervisor may dismiss a contractor as per Zimbabwe policy;
- viii. Overturn dismissal – after suspension a supervisor may overturn the dismissal; this will cater for cases where a dismissal has occurred in error or where the contractor has appealed the dismissal and the appeal has been successful.

5.1.6 Identify Roads for Contractor Allocation

Overview of requirements:

A management user should be able to view the geographical layout of an area in a map format, through GIS integration. The layout should indicate visually where there are contractors allocated, and where there are no contractors allocated.

This will allow the management user to identify potential locations where additional contractors may be allocated. It must be noted that it will not always be feasible to allocate contractors to all potential roads e.g. there may be no contractors living in the vicinity of the road. Further, the system must cater for showing only certain "Road Types" as not all "Road Types" are eligible for Zimbabwe contractor allocation. "Road Types" eligible for Zimbabwe Contractor allocation must be parameter driven.

A management user will also use try to allocate contractors to an area where there is potential for allocation, and there is already a savings club in existence. This will allow the new contractor to join an existing savings club instead of needing to start a new savings club.

Overview of system functions:

The following system functions are required:

- i. Display contactors allocated in a geographical area, in a map format;
 - a. Allow for filtering only on those "Road Types" which are eligible for Zibambele Contractor allocation.
- ii. Allow a management user to drill down into an area on the map, and then allocate a contractor to that area (if there is no contractor already allocated to that area);

5.1.7 Payments

5.1.7.1 Process Payment information

Overview of requirements:

Zibambele contractors will be paid via the PERSAL system. A monthly report from PERSAL will be received which must be uploaded to Zibambele Management Solution, linking the payments made in PERSAL to the relevant contractor to whom the payment was made. Staff can then easily verify whether payments were made or not made to specific contractors.

A report is also received for those payments which are returned e.g. if the bank account is closed or banking details changed. The returns report must also be uploaded to Zibambele Management Solution, linking the payment returns to the relevant contractor whose payment was returned. Staff can then easily verify whether payments were returned for specific contractors.

The Zibambele Management Solution must make provision to manually capture/update/remove a payment and payment return record against a contractor. This would cater for instances where the payment to a contractor was made through some means other than PERSAL, or if there are anomalies in the payment/payment returns report.

For new contractors it is envisaged that the contractor master data will be captured in both Zibambele and in PERSAL. There is no planned automated interface between PERSAL and Zibambele Management Solution for contractor master data.

If a contractor is dismissed or service is terminated for whatever reason the payment will be manually stopped in PERSAL. Relevant records indicating that the payment has been stopped must also be captured in Zibambele Management Solution as a manual exercise by the Data Administrator.

Overview of system functions:

The following system functions are required:

- i. Upload and process PERSAL payment file;
- ii. Upload and process payment returns file;
- iii. Manual capture/update/remove a payment or payment return record against specific contractor;
- iv. Capture update/remove record of payment stopped against specific contractor;

5.1.7.2 Payment History

Overview of requirements:

A user should be able to view payment history for a Zimbabwe contractor. A link must be provided on the contractor's profile which provides detailed information on the payments made, status of the payments, payments stopped and any payment returns. Note that the Payment History must make provision for the fact that banking details may change over time, it is therefore important to know which bank accounts payments were made into and which bank accounts payment returns were received from.

Overview of system functions:

The following system functions are required:

- v. View Payment History for Zimbabwe contractor;

5.1.8 User Administration

Overview of requirements:

The System Administrator will be required to manage the system users.

Overview of system functions:

The following system functions are required:

- i. Add new system user, and allocate default password;
- ii. Allow user to change password, expiring password every 'x' days where 'x' is parameter-driven;
- iii. Update user profile information;

- iv. Manage user access, allowing system administrator to grant user access based on the user's role;
- v. Provide functionality for system administrator to expire user access (example when a user resigns or transfers to different business unit);
- vi. Unlock expired user accounts;

5.1.9 Business Reporting

Overview of requirements:

System reporting is a key requirement of the Zibambe Management Solution. Reports will provide the business intelligence required to manage and enhance the programme.

It is expected that the reports should allow the user to input the parameters required to run reports and extract reports on demand. Each report listed must be analysed individually and all possible parameters must be provided. Examples of parameters include date ranges, roads or areas, supervisor name etc.

Where applicable both detailed and summary reports should be provided e.g. summary count of contractors per region and detailed reports of contractors per region. It is critical that summary and detailed reports correspond with each other, and the same code must be used as far as possible to prevent discrepancies and ease of maintenance.

Reports which are required on a regular basis will be identified and such reports must automatically be run (e.g. in batch mode at month-end) and placed in a central access place for any authorised user to access (E.g. share drive or FTP server). This will prevent unnecessary overhead on the system as the same reports are run several times by different users. Provision must be made to allow authorised users to run reports on an adhoc basis e.g. to obtain real-time data at specific points.

The business rules and detailed data requirements for each of these indicative reports must be confirmed during the design phase.

All reports must be exportable into Excel and PDF formats.

Overview of system reports:

The following indicative system reports are required:

ZMS

- i. Zibambele Contractor Reports:
 - a. Zibambele contractors per Region/Cost Centre/RRTF area/Amakhosi Area;
 - b. Zibambele contractors per District Municipality/ Local Municipality/ Ward;
 - c. Contract renew reports;
 - d. Contractors with active warnings;
 - e. Contractors on suspension;
 - f. Contractors exit reports e.g. voluntary, death or dismissal per policy;
 - g. Contractors dismissed;
- ii. Tool Register Reports
 - a. Tool Requests (based on a date range e.g. within previous month):
 - i. Tool request received, no order issued;
 - ii. Tool request received, order issued and still in SCM process. Show elapsed time since request was received;
 - iii. Tool request received, order issued, tool received but not yet issued to contractor. Show elapsed time since request was received;
 - iv. Tool request received, order issued, tool received and tool issued to contractor. Show elapsed time since request was received;
 - b. Tool Allocation Reports
 - i. Provide standard reports on tools allocated based on various input parameters e.g. per type of tool, per region, age of tool etc.
- iii. Zibambele Supervisor Reports:
 - a. Zibambele contractors per supervisor;
- iv. Inspection Reports:
 - a. Inspections per supervisor;
 - b. Schedule of inspections to be conducted;
 - c. Schedule where inspections not conducted;
- v. Roads Allocation Reports:
 - a. Contractors allocated per road/area/region/cost centre;
- vi. Payment Reports:
 - a. Payments made per month;
 - b. Payments not made per month for active contractors;
 - c. Payment return reports;
 - d. Payments made to dismissed contractors;
- vii. Trainings Club Reports:

Overview of requirements:

Zibambele contractors may voluntarily set-up and join savings clubs, here after know as training clubs. The training clubs are constituted and managed by the members.

The training clubs are utilised by the Department to transfer training and also a communication channel with the Zibambele Contractors.

It is envisaged that engagements between the Training Clubs and KZN DoT will be formalised, whereby the Savings Clubs will be requested to provide the Department with information on the membership of their Savings Clubs. This interaction will be managed via SMS and the data must be updated into the Zibambele Management Solution.

The Treasurer of the Savings Club will SMS the information to a dedicated SMS number on a monthly basis, the system must poll this number and update into the system. The minimum data requirements are:

- i. Maintaining members of the training club. Provision must be made for the once-off upload of all members, and making changes to membership as new members join and existing members leave;
- ii. Tracking training provide to the club and member.

Zibambele Management Solution

Overview of system functions:

The following system functions are required:

- i. Zibambele Management Solution must upload initial data via SMS which will be sent from the Treasurer of the Savings Club i.e. membership.
 - ii. Provision must be made for the fact that a contractor may change savings clubs over time, and that a contractor may belong to more than one savings club at a time;
 - iii. On a monthly basis track changes to membership and changes to bank balance through SMS which will be sent from the Treasurer of the Savings Club;
 - iv. From Zibambele Contractor profile, view Savings Club that the contractor is a member of;
 - v. View Savings Club History in terms of membership and balances;
 - vi. Manually adjust savings club history to address anomalies and errors in SMS which are sent; An audit trail of such adjustments must be maintained;
 - vii. Summary of membership per training club;
 - viii. Summary of Training Clubs per ward, local municipality and district municipality.
 - ix. Contact details of savings clubs and location of savings club.
- viii. Statistical reports:
- a. Gender, youth, disability, educational levels;
 - b. Exits per period;
 - c. Replacements per period;

ix. Home Affairs Reconciliation Report:

- a. The Department is provided monthly with a download from the Department of Home Affairs indicating employees currently on the Government payroll that are deceased. This download will be made available to the Zimbabwe Management Solution to assess against system data and indicate if there are Zimbabwe Contractors that are deceased and still on the payroll according to Zimbabwe Management Solution.

This information of such Zimbabwe Contractors must be provided in a report format so that necessary action to rectify can be taken.

x. BAS Reconciliation Report

- a. Provide reports to facilitate a reconciliation between BAS and Zimbabwe Management Solution:
 - i. Zimbabwe Contractor payment reconciliation;
 - ii. Tools payments reconciliation;

xi Customised reports for specific users.

5.1.10 System Audit Reporting

Overview of requirements:

Reporting for system audits is considered a critical function. System audit reports must be parameter driven, allowing users to input parameters such as date range, user name etc. as deemed to be most useful in the context of the type of report.

Overview of system audit reports:

- i. New contractors added;
- ii. Draw general system audit trails;

5.1.11 System Administration

Overview of requirements:

The System Administrator will be required to manage the configuration and set-up of the system;

Overview of system functions:

The following system functions are required:

- i. Manage Lookup for Equipment types;
- ii. Manage system parameters (e.g. monthly payment amount, number of allowed warnings for poor performance, number days allowed before forcing expiry of password);
- iii. System security must be compliant with the Information Security Policy;
- iv. The system must provide a high level of configurability, especially with regards to adding to new data fields on forms. Ideally there should be a drag-and-drop form design interface which the administrator can use to add/modify data fields as business needs change;
- v. The system must authenticate to the Departmental directory.

5.1.12 System Integration Requirements

The Zibambe Management Solution will not operate in isolation. Integration into certain key systems will be required in order to yield maximum value from the Zibambe Management Solution.

5.1.12.1 GIS

Integration is required into the ArcView GIS system which used by the Department of Transport. The minimum requirements are:

- i. To provide a graphical layout of the areas or roads where Zibambe Contractors are allocated;
- ii. To provide a graphical layout of the areas or roads where and where there is potential for contractor allocation. Include provision to filter based on allowed "Road Types";
- iii. To provide a graphical layout of the existence of Savings Clubs; and
- iv. To provide a graphical layout of the geo-placement of Zibambe Contractors assigned to specific supervisors.

The GPS co-ordinates should be determined from the GIS system.

5.1.12.2 Remote Inspections

It is envisaged that a supervisor will use a mobile device which could be a cellular telephone, a PDA, a tablet or some other handheld device.

An application to capture monitoring report will be developed for use on the mobile device.

Whilst there is no preference for the type of mobile technology used to conduct the inspections, the technology must be cost-effective in order to be a sustainable solution. There will be 100 - 800 devices required.

The devices must support both online and offline transaction processing. This includes ability to draw inspection schedules (see 5.1.4) and ability to conduct inspections (see 5.1.5).

5.1.12.3 Enterprise Content Management

All documents which are uploaded through the Zibambele Management System must be stored in the ECM. The ECM solution being implemented in KZN DoT is Alfresco.

The user will use the Zibambele Management System as the interface to upload and view documents, however the documents will actually be stored in the ECM. Web service technology may be used as an option to facilitate the integration between the systems.

5.1.13 Future Developments

There is a possibility that this programme becomes a National Programme.

With this in mind it is critical that the system is scalable, easily maintainable and adaptable to future needs.

5.2 Additional Technology requirements

The application should be web-based. The Department has invested in Oracle as the database systems; **however Ms SQL may also be used if appropriate.**

5.3 Data requirements

5.3.1 Class Model:

The class model is attached as annexure B to this URS, and details the data entities and their inter-relationship within the context of the Zibambele Management Solution. This is the minimum requirements and must be confirmed during the detailed design Phase of the project.

Further, the solution must be configurable allowing the System Administrator ability to easily add or modify data fields on forms as the business needs change.

5.4 Input form requirements

A simple and intuitive design is required. All forms must be easily editable by the System Administrator without needing to change code; this will facilitate quick turnaround to changes in business needs.

The system will be branded as a KZN DOT System.

The inspection form must be simple and clear, using tick boxes where appropriate, with a view that this will ultimately be conducted on a mobile device.

5.5 Output Report Requirements

All reports must be exportable into MS-Excel format.

Clear and unambiguous error messages should be issued as necessary.

5.6 Training requirements

Training will be undertaken in the form of instruction and users handbook as part of the project deliverables. Training of the users will take place following system testing and will be conducted on site.

Provision must be made for application maintenance and support after implementation.

5.7 System testing requirements

System testing requires both developer and user testing. Developer testing ("alpha" testing) takes place during development to ensure that the application code performs without bugs. User testing takes place following the implementation of the application on a test server platform, by the user, to test the functionality of the application as a whole.

It is usually during the user testing that alterations and corrective programming is needed, and for this reason at least ten working days are required.

5.8 Backup and contingency requirements

Due to the critical nature of the Zibambele Management Solution, daily backups will be required with a clear Disaster Recovery Plan (DRP) and Business Continuity Plan (BCP).

5.9 Security and control requirements

5.9.1 Confidentiality requirements

The system will have only one administrator, whose role it will be to control access to the application by means of the administrator functions in the application. The application is not intended for general use, and owing to the sensitivity of the contents of the register, only qualifying officials that request use of the application will be granted access to it.

Appropriate processes must be in place to apply for and approve access for officials prior to granting the access to the system.

5.10 System performance

Performance testing must be conducted, in particular from remote outlying sites.

The service provider is expected to conduct an initial assessment of the sites from which the application will need to be accessed and used, consider available bandwidth and provide an upfront solution design with these factors in mind.

Where necessary alternate means of systems access or utilisation may be proposed, whilst adhering to SITA and Departmental security policies.

5.11 Project Implementation Approach

The project will take a phased approach. Note that Phases 1, 2 and 3 as described below are expected to include all stages of the systems development lifecycle (SDLC) i.e. analysis, design, development, testing, training, change management, go-live and post-implementation support.

5.11.1 Phase 1: Implementation of base system

- i. Finalise URS and obtain sign-off;
- ii. Compile detailed functional and technical specifications;

- iii. Develop solution architecture;
- iv. Implementation of base system providing:
 - a. Manage Zibambe Contractor Information (refer 5.1.1.1. and 5.1.2);
 - b. Manage Supervisor Information (refer 5.1.1.2 and 5.1.3);
 - c. User and System Administration (refer 5.1.8 and 5.1.11); and
 - d. Critical reports (5.1.9 i, ii, iii and 5.1.10)
- v. KZN DOT to provide the service provider with a spreadsheet/s from which baseline data will be uploaded to the system;
- vi. ;

5.11.2 Phase 2: Implementation of inspections

- i. Develop solution architecture for Phase 2;
- ii. Implementation of remaining system functionality as per the URS (i.e. 5.1.4, 5.1.5, 5.1.6, 5.1.7)
- iii. Implementation or remaining reports (i.e. 5.1.9 iv-x);
- iv. Modifications to developed system components from earlier Phases as may be necessary;
- v. Inspection schedules can be drawn and inspections can be captured into system however no mobile device integration yet. This may be a manual process of printing out inspection schedules, completing forms for the inspections and thereafter capturing data in the system;
- i. Deliver full functionality to conduct mobile inspections (5.1.12.2);

5.11.3 Phase 3: Implementation of mobile inspections and full integration

- i. Full integration into GIS and ECM (5.1.12.2 and 5.1.12.3);
- ii. Modifications to developed system components from earlier Phases as may be necessary;

A summary of the proposed Phasing is provided in Table 3.

Table 3: Proposed Phasing of Zibambe Management Solution

| URS Reference & Functionality | | Phase |
|--|---|-------|
| 5.1.1 Manage Person Information | 5.1.1.1 Manage Zibambe Contractor Information | 1 |
| | 5.1.1.2 Manage Supervisor Information | 1 |
| 5.1.2 Allocate Tools | | 1 |
| 5.1.3 Supervisor Allocation | | 1 |
| 5.1.4 Inspection Schedule | | 2 |
| 5.1.5 Conduct Inspection | | 2 |
| 5.1.6 Identify Roads for Contractor Allocation | | 2 |
| 5.1.7 Payments | 5.1.7.1 Process Payment Information | 2 |
| | 5.1.7.2 Payment History | 2 |
| | | |
| 5.1.8 User Administration | | 1 |
| 5.1.9 Business Reporting | 5.1.9 i Zibambe Contractor Reports | 1 |
| | 5.1.9 ii Tool Register Reports | 1 |
| | 5.1.9 iii Zibambe Supervisor Reports | 1 |
| | 5.1.9 iv Inspection Reports | 2 |
| | 5.1.9 v Roads Allocation Reports | 2 |
| | 5.1.9 vi Payment Reports | 2 |
| | 5.1.9 vii Training Club Reports | 2 |
| | 5.1.9 viii Statistical reports | 2 |
| | 5.1.9 ix Home Affairs Reconciliation Report | 2 |
| | 5.1.9 x BAS Reconciliation Report | 2 |
| 5.1.10 System Audit Reporting | | 1 |
| 5.1.11 System Administration | | 1 |
| 5.1.12 System Integration | 5.1.12.1 GIS | 3 |
| | 5.1.12.2 Remote Inspections | 3 |
| | 5.1.12.3 ECM | 3 |

Annex A : Abbreviations & Definitions

A.1 Abbreviations

| | |
|--------|-------------------------------------|
| COTS | Custom Off The Shelf |
| BCP | Business Continuity Plan |
| DOT | Department of Transport |
| DRP | Disaster Recovery Plan |
| ECM | Enterprise Content Management |
| FTP | File Transfer Protocol |
| GIS | Geographical Information System |
| HTML | Hyper-text Mark-up Language |
| ID | Identification |
| KZN | KwaZulu Natal |
| KZNPG | KwaZulu Natal Provincial Government |
| MS | Microsoft |
| MS SQL | Microsoft SQL Server |
| PDA | Personal Digital Assistant |
| PERSAL | Personnel Salary System |
| SARS | South African Revenue Services |
| SITA | State Information Technology Agency |
| URS | User Requirements Specification |

Annex B : High Level Class Model

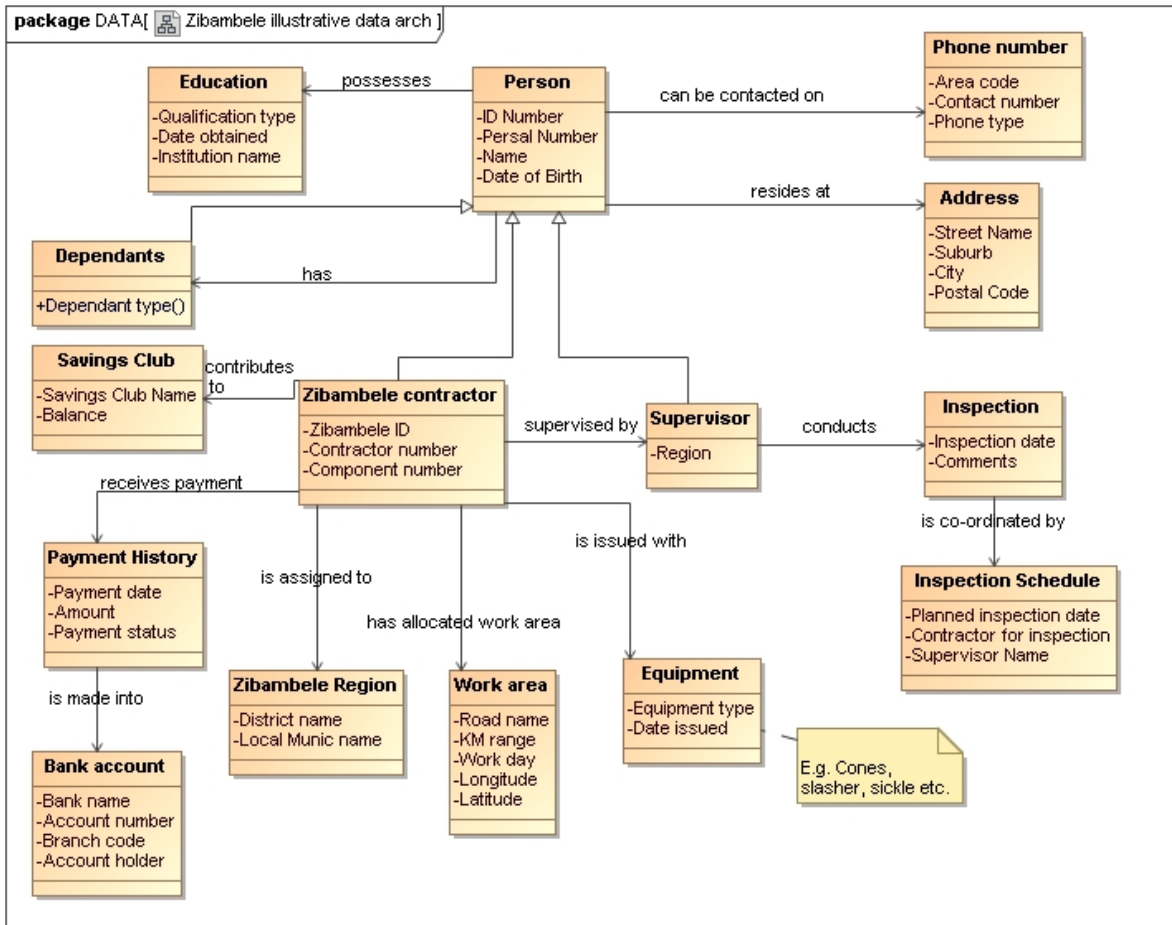


Figure 16: KZN DOT Zibambele Management Solution - Class Diagram

This is an indicative class model only and must be confirmed during the design phase. Further the system must be configurable to allow the administrator the ability to add or modify fields on a forms without necessitating code changes.