***i****ntelligent* **R**evenue **E**nhancement and **P**rotection **S**olution

*i*REPS

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ireps bible v0.1 230601

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# Introduction

# What is iREPS

# What inspired iREPS

# The Energy paradigm in SA

# The Problem Space - Challenges

## Local gov revenue model

## The Energy Distribution Network Problems

## Billing System at local gov level

## Revenue Collection

## Eskom Billing at local gov

# Solutions – iREPS

Solution strategy – Three pillars

## The HR

## The Processes

## The Technology

# iREPS Philosophy

## Best User Experience

Material UI

## Latest Web Technologies

Google Analytics

Artificial Intelligence

Machine Learning

## Sustainability

## Give back to community

# iREPS architecture

## The Client Systems

## The Server Systems

## iREPS Technologies

## Built-in Security

# iREPS users

## User Roles

### Trial User

### Full user

#### Super User

#### Manager Roles

#### Supervisor

#### Field Worker

## Municipal Customers

# iREPS Key Data Components Definitions

## Cadastral

## Deeds Office

## Supply Chain (SC)

This is a process that starts with the Purchase Order (po). The user issues a po that must follow the process stipulated in the diagram below.

SC process diagram

### PO and approval

The PO is a document that records the desire of the user to purchase some items form the supplier. The items may be meters, circuit breakers, seal, etc. This document is captured as a scanned doc into iREPS SC module. For the process to transition to the next step, the PO must be **approved**. The approval is done electronically by completing and signing a PO document. This means a user signature is required authentication.

### PO and Invoicing

Once the PO is received by the supplier, an invoice is generated by the supplier for payment of the goods ordered. The invoice is then captured into iREPS via **invoice capture form**.

### PO and Invoice payment

After receiving the invoice, the user then remits and a Proof of Payment (pop) is captured into iREPS. Upon pop capturing by iREPS, the pop email is automatically dispatched to the supplier and this allows the supplier to delivers the goods.

### PO and Goods **Receiving** (grv)

On receipt of the goods, a stores user will electronically sign a grv document. The grv will indicate which **stores** the goods are received into. Its important that as grv stage, the goods are attached to a particular store as the user may have many distributed all over country or world. iREPS has a **stores registration sub-process** that registers stores into the system.

## Field Data

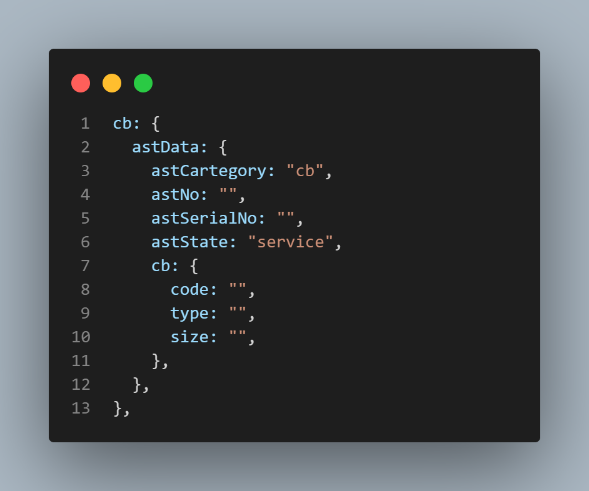
#### ast data – common attributes

1. **ast category**: This is includes only meter, cb, seal, box, pole.
2. **ast no**: This is the number allocated to an ast
3. **ast serial no**:
4. **ast state**: This indicates the state of the ast and is limited to ‘**stores’**, ‘**checked out’**, ‘**field’**, ‘**service’**

#### ast data – specific attributes

**m**eter:

1. meter.code:
2. meter.type:
3. meter.phase:
4. meter.manufacturer:

**c**b:

1. cb.code:
2. cb.type:
3. cb.size:

**s**eal:

1. seal.code:
2. seal.type:

**b**ox:

1. box.dimensions:

1.1) length:

1.2) width:

1.3) height:

1. box.code:
2. box.type:
3. box.color:

pole:

1. pole.code:
2. pole.type:
3. pole.length:

### Automatically Acquired Field Data

### User Acquired Field Data

# iREPS Processes

## Supply Chain

The supply chain process starts with the issue of a **Purchase Order (PO)** and ends with goods **receipt** (GRV) and **witness** at the store where the ordered goods are delivered by the supplier. This process manages all data involved in the order, invoice, invoice payment, delivery and receipt of goods. The supply chain data is presented to the user via a PO table.

### Supplier Registration Process

Every supplier is registered into the system and the supplier data is stored fields indicated below. The supplier registration form below is used to capture the supplier data. All data entered into the form is validated before its sent iREPS server to make sure there is not data corruption.

#### Supplier Data Structure

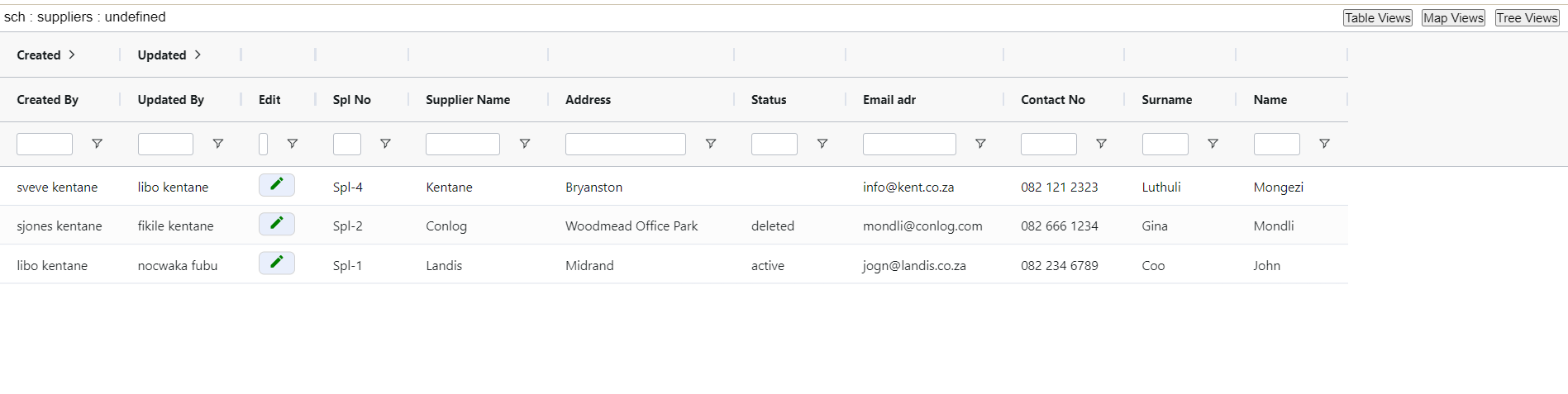


#### Supplier Registration Form Structure



#### Table Structure

Table View



Column definitions

### Stores Registration Process

Data Structure

Form Structure

Table Structure

### Stock/Product Definitions Process

All goods supplied by the suppliers have names, codes and definitions. For example, Conlog has a meter called BEC66. The definition of this meter is registered in iREPS so that when a PO is made, the system is aware of the product thereby increasing data integrity in the system. When a PO is made, all items in the PO have to be items in the stock /product definitions database.

Data Structure

Form Structure

Table Structure

### Purchase Order (PO) Process

Data Structure

Form Structure

Table Structure

### PO Approval Process

Data Structure

Form Structure

Table Structure

### PO Invoicing Process

Data Structure

Form Structure

Table Structure

### PO Goods **Receiving** (grv) Process

Data Structure

Form Structure

Table Structure

### PO Goods Receiving (grv) **Witness** Process

Data Structure

Form Structure

Table Structure

## Transactions

Transactions are at the heart of iREPS activity. Transactions are essentially asset transaction because they refer to actions that are performed on an ast. For example. An **installation** transaction happens whenever an ast is installed. Also, a **disconnection** transaction happens whenever a meter (an ast) is disconnected – maybe as a credit control exercise.

All **assets** in iRESP are managed via transactions. A transaction is always linked to an ast. For example, a **vending** transaction is a transaction liked to a particular meter when that electricity tokens are purchased for that meter. iREPS has a number of transactions that are all summarized in the table below.

List of all iREPS transactions



# iREPS user interface

Interfaces describe what the user sees so as to be able to interact with iREPS. The table below shows summary of all high level interfaces (ones that are available for menu level 1 (ml1)).

## Menu System

iREPS is a menu driven enterprise application. This means access to any functionality in the system is via a menu. Below is a tree showing menu system.

The menu system is characterized by different levels on which a particular menu belongs to. Menu Level 1 (ml1) is the highest-level menu. All key functionality is found at this level.

### Assets Menu Level 1 and Level 2 Functionality

Click on ASTS: display a **table** of all iREPS assets (meters, circuit breakers, seals, boxes and poles)

* Click on ASTS menu button > METERS: display **table** of only **meters**
* Click on ASTS menu button > CB: display **table** of only **circuit breakers**
* Click on ASTS menu button > SEAL: display **table** of only **seals**
* Click on ASTS menu button > BOXES: display **table** of only **boxes**
* Click on ASTS menu button > POLES: display **table** of only **poles**

### Assets Table Page Menus

The rows in a table have menu buttons in some of the columns and the list below indicates the outcomes of a click on a menu button.

* Click on EDIT ast > display asset edit form (astForm)

## Authentication System

## Assets

### Meter

Data Structure

meter: {

astData: {

astCartegory: "meter",

astNo: "", // required

astSerialNo: "",

astState: "service",

meter: {

code: "",

type: "", // required

phase: "", // required

manufacturer: "",

},

},

},

#### The Tabular View – iREPS Assets Table

#### The Spatial view – iREPS Assets Map

#### The Hierarchical View – iREPS Assets Tree

## Transactions

## Service Connections - scnc

All scns are listed in a collection called scnc.

#### The Tabular View – scns Table

Columns

Col1: Created by

Col2: Created At Datetime

Col13: Updated by

Col4: Updated At Datetime

Col5: Transformer No

Col6: Feeder No

Col7: Scns No

Col7.1: Box No

Col7.1.1: Circuit Breaker

Col7.1.2 Meter No

Col7.1.3.Seal No

Col7.2: Erf No

Col7.2.1: Circuit Breaker

Col7.2.2: Meter No

Col7.2.3 Seal No

#### The Spatial view – scns Map

#### The Hierarchical View – scnc Tree

## Dashboard

## Supply Chain

## Cadastral Data Management

## iREPS Body of Knowledge

## Admin

# Partner Network

## Energy Network Assets Partners

## Electricity Vending Partners

## Academic Institutions

# iREPS Development Strategy and Sustainability over time

# Why would you want to use iREPS

## Data Cleansing

Update customer data in the billing system

## Manage and Track Assets

Track assets from procurement to delivery at stores,

Track assets checked out from stores to installation in the field

Monitor field assets via Advanced Metering Infrastructure (AMI)

## Enhance and Optimize Revenue Collection

Customer Tariff management

## Electricity Vending

Provide third parties with a electricity vending platform

## Manage and Prevent Meter Tempering

Respond promptly to meter temper alarms thereby eliminating electricity theft

## Debt Collection

Link customer aged debts to vending system for an optimal debt collection

## Electronic Municipal Invoice Delivery

## Remit Municipal Bills/Invoices

## Credit Control

Automate management of electricity cutoff (disconnections) and reconnections

## Instant Access to iREPS data

Client (Municipality) access to iREPS online for immediate and up-to-date data and reports

# Appendix

## Data dictionary

Here you find al the terms used in this document clearly defined