Eskom	Top100 Smartforms: Top100 KPIs	Group IT

Title : **Group IT Technical Specification** **System Name: Top100 KPIs** **Change Control Reference Number: 1258685** **USVD Reference number: R17640130**	Unique Identifier	**212-55**
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Glossary of Terms

Abbreviations

Abbreviation	Description
K2	Workflow management tool used
Top100	Workflow system managing forms within Top100
AD	Active Directory
ERD	Entity Relationship Diagram
DB	Database
DR	Disaster Recovery
SQL	Sequential Query Language
ODAC	Oracle Data Access Components/Connector

Definitions

Abbreviation	Description
System	It can be application, or middleware
ERD	Details how tables in the DB relate

1 Introduction

The technical specification determines the architecture requirements of the solution. This is where the data models, processes, classes, data flows, methods and variables are described. For each function, the technical specification describes how it will be carried out, what parameters are required, what the data mapping is, what cases need to be tested and how any errors and data quality issues should be handled.

1.1 Purpose of this document

This Document describes the Technical Details about the implementation of the BI Top100 KPIs.

As per the Functional Specification the form will be developed.

2 Business Architecture

1. Business Strategies and Plans

2. Business Processes and Policies

   The form is used by Eskom employees to capture KPIs.

   - **Inputs :** Capturer completes and submits the form
   - **Process:** The Capturer will complete the form on K2 smartforms. Once submitted, the form will be routed to the relevant approvers.
   - **Output :** Once form is approved , an email message will be sent to the capturer
   - **Output:** Once form is rejected, an email message will be sent to the capturer

3. Business Organisation Design

   This form will be available to the EPM/relevant Users.

3 Business Information Architecture

1. **Information Integrity and Custodianship**

   The data will be secure – no unauthorised user will be allowed to access or alter the data or the information.

   EPM employees will be the primary users of the system and the information. The Databases will be managed by the BI team under Group IT. The system will have an audit trail throughout its life span.

2. **Information Access and Confidentiality**

   This form will be accessed by EPM Users/BI User using Windows authentication. All users should be active on AD and be part of the Capturer/Approver group in order for them to access and use the form. Admin role will be granted to BI Support.

3. **Information Related Business Continuity**

   Beyond standard DB backup and recovery, DR will be used for business continuity.

4. Identification and Authentication

Access to the form will be governed by standard Active Directory Services and T100_KPI_Users table. Authentication.

4 Integration Architecture

Below is the diagram that shows how the different applications integrate with each other for the **BI Top 100 KPIs** forms Solution to function

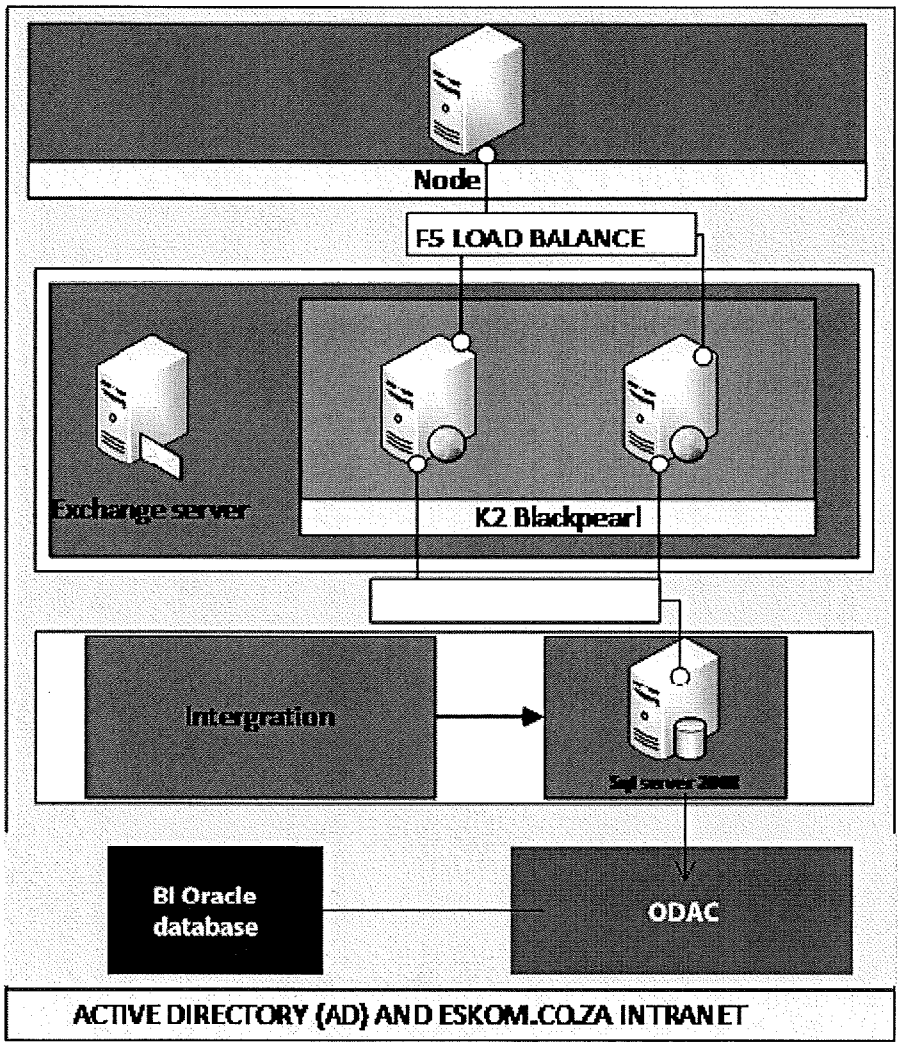


Figure 2: Integration Architecture

5 Data Architecture

5.1 Data Models

5.1.1 SQL Table T100_KPI_REP_AREA

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Rep_Area_ID	Integer	Reporting Area Identity number	N
CDE	VARCHAR (4)	Reporting Area CDE	Y
Rep_Desc	VARCHAR (200)	Reporting Area Description	Y
Rep_Function	VARCHAR (20)	Reporting Area Function	Y

Table 1. **T100_REP_AREA**

5.1.2 SQL Table T100_KPI_REP_AREA_XREF

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
KPI_ID	VARCHAR (20)	KPI Identity number definition(FK)	N
Rep_Area_ID	Integer	Reporting Area Identity number(FK)	N

Table 2. **T100_KPI_REP_AREA_XREF**

5.1.3 SQL Table T100_KPI_DEFINITION

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
KPI_ID	VARCHAR (20)	KPI ID identity number	N
KPA	VARCHAR(1000)	KPI Definition KPA description	Y
Name	VARCHAR(100)	KPI Definition Name	Y
UOM_ID	Integer	KPI Definition Unit of Measure	Y
Description	VARCHAR(1000)	KPI Definition Description	Y
Valid_FRM_TMS	DateTime	KPI Definition Valid from	Y
Valid_To_TMS	DateTime	KPI Definition Valid To	Y
Operation	VARCHAR(10)	KPI Definition Operation	Y
Rep_Freq_ID	Integer	KPI Definition Rep Frequency ID	Y
SHC	VARCHAR(1)	KPI Definition SHC	Y
CP	VARCHAR(1)	KPI Definition CP	Y
IR	VARCHAR(1)	KPI Definition IR	Y
Decimals	Integer	KPI Definition Decimals	Y
No_Approvers	Integer	KPI Definition Number of Approvers	Y
Modified_By	Integer	User name	Y
Modified_Date	DateTime	User captured/modified date	Y
Objective	Varchar(20)	Description of the objective info	

Table 3. **T100_KPI_DEFINITION**

5.1.4 SQL Table T100_UOM

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
UOM_ID	Integer	UOM Internal Identity	N
UOM_Desc	VARCHAR (200)	UOM Description	Y

Table 4. **T100_UOM**

5.1.5 SQL Table T100_KPI_MODE_XREF

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
KPI_ID	VARCHAR (20)	KPI ID Internal Identity	N
MODE_ID	Integer	Mode ID Internal Identity	N
Actual	Integer	KPI Mode Actuals Info	Y
Target	Integer	KPI Mode Target Info	Y
Projection	Integer	KPI Mode Projections	Y

Table 5. **T100_KPI_MODE_XREF**

5.1.6 SQL Table T100_KPI_USER_XREF

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
KPI_ID	VARCHAR (20)	KPI ID Internal Identity	N
User_ID	Integer	Mode Id internal Identity	N
Actual	Integer	KPI Actuals Info	Y
Target	Integer	KPI Target Info	Y
Projection	Integer	KPI Projection Info	Y
Role	Integer	Role info	Y
Valid_FRM_TMS	Datetime	Valid from which date	Y
Valid_TO_TMS	Datetime	Valid to which date	Y
Valid	Varchar(5)	Valid (Y/N)	Y
UserLevel	Integer	User Level info	Y
CreatedBy	Integer	User created	Y
ModifiedBy	Integer	User modified	Y
CreatedDate	Datetime	User created date	Y
ModifiedDate	Datetime	User modified date	Y

Table 6. **T100_KPI_USER_XREF**

5.1.7 SQL Table T100_MODE

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
MODE_ID	Integer	Mode identity internal identity	N
CDE	VARCHAR (10)	Code of the Mode	Y

Table 7. **T100_MODE**

5.1.8 SQL Table T100_USERS

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
UserID	Integer	Internal Sequence Number	N
DomainID	Varchar(30)	Domain identity number	Y
FullName	VARCHAR (50)	Users Full Name	Y
Email	VARCHAR (50)	Users Email address	Y
Active	VARCHAR (2)	Active(Yes/No)	Y
Admin	VARCHAR (10)	Admin(Yes/No)	Y
CreatedBy	Integer	Created User	Y
ModifiedBy	Integer	Modified User	Y
CreatedDate	DateTime	User created date	Y
ModifiedDate	DateTime	User Modified date	Y

Table 8. **T100_USERS**

5.1.9 SQL Table T100_KPI_ACTUALS

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Top_KPI_ACTUALS_ID	integer	Internal Sequence Number	N
KPI_ID	VARCHAR (15)	KPI Identity Number	N
Mode_ID	VARCHAR (15)	Mode Identity Number	N
Rep_Period	DateTime	Date of the Reporting Period	N
KPI Value	Decimal(8,2)	KPI Value Info	Y
Rep_Level_ID	Integer	Reporting Level Identity Number	Y
Proc_Inst	Integer	Proc Inst Info	Y
Status_ID	Integer	Status Identity Number	Y
User_ID	Integer	User Identity Number	Y
Type	VARCHAR (12)	Type Info	Y

Table 9. **T100_KPI_ACTUALS**

5.1.10 SQL Table T100_KPI_KPI_Audit

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Audit_ID	Integer	Audit Identity Number	N
Unique_ID	VARCHAR (4)	Unique Identity Number	Y
KPI_ID	VARCHAR (20)	KPI ID Info	Y
TRN_TMS	VARCHAR (50)	Transaction Timestamp Information	Y
Mode_ID	Integer	Mode Identity Number	Y
Rep_Lev_ID	Integer	Reporting Level Information	Y
Valid_Frm_TMS	DateTime	Valid To Date	Y
Valid_To_TMS	DateTime	Valid From Date	Y
Type	Varchar(12)	Type Information	Y
Remark	Varchar(2000)	Comments Information	Y
KPI Value	KPI_Value	Kpi Value Information	Y
Creator_ID	Creator_ID	User Info	Y
Approver_ID	Approver_ID	User Info	Y
General_Comments	Varchar(200)	Kpi info	Y

Table 10. **T100_KPI_KPI_Audit**

5.1.11 SQL Table T100_STATUS

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Status_ID	Integer	Status Identity Number	N
Status_desc	VARCHAR (20)	Description of the status	Y

Table 11. **T100_Status**

5.1.12 SQL Table T100_KPI_PROJECTIONS

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Top_projection_ID	Integer	Internal Sequence Number	N
KPI_ID	VARCHAR (20)	KPI Identity Number	N
Mode_ID	Integer	Mode Identity Number	N
Rep_Level_ID	Integer	Reporting Level Identity Number	Y
Valid_FRM_TMS	DateTime	Valid from date/timestamp	N
Valid_To_TMS	DateTime	Valid to date/timestamp	Y
Status_ID	Integer	Status of the KPI	Y
User_ID	Integer	User Info	Y
KPI_Value	Decimal(8,2)	KPI Info	Y
Proc_Inst	Integer	Proc Inst Info	Y
Type	Varchar(12)	Type Information	Y

Table 12. **T100_KPI_PROJECTIONS**

5.1.13 SQL Table T100_KPI_TARGETS

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Top_Targets_ID	integer	Internal Sequence Number	N
KPI_ID	Varchar(20)	KPI Identity Number	N
Mode_ID	VARCHAR (5)	Mode Identity Number	N
Rep_Level_ID	Integer	Reporting Level Info	Y
Valid_FRM_TMS	DateTime	Valid from date	N
Valid_TO_TMS	DateTime	Valid to date	Y
Status_ID	Integer	Status Info	Y
User_ID	Integer	User Info	Y
KPI_Value	Decimal(8,2)	Value of KPI	Y
Proc_Inst	Integer	Proc Inst *nfo*	Y
Type	Varachar(12)	Type Info	Y

Table 13. **T100_KPI_TARGETS**

5.1.14 SQL Table T100_KPI_Definition_Audit

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
KPI_ID	VARCHAR (20)	KPI ID identity number	N
Objective	Varchar(2000)	Description of objective info	Y
KPA	VARCHAR(1000)	KPI Definition KPA description	Y
Name	VARCHAR(100)	KPI Definition Name	Y
UOM_ID	Integer	KPI Definition Unit of Measure	Y
Description	VARCHAR(1000)	KPI Definition Description	Y
Valid_FRM_TMS	DateTime	KPI Definition Valid from	Y
Valid_To_TMS	DateTime	KPI Definition Valid To	Y
Operation	VARCHAR(10)	KPI Definition Operation	Y
Rep_Freq_ID	Integer	KPI Definition Rep Frequency ID	Y
SHC	VARCHAR(1)	KPI Definition SHC	Y
CP	VARCHAR(1)	KPI Definition CP	Y
IR	VARCHAR(1)	KPI Definition IR	Y
Decimals	Integer	KPI Definition Decimals	Y
No_Approvers	Integer	KPI Definition Number of Approvers	Y
Modified_By	Integer	User name	Y
Modified_Date	DateTime	User captured/modified date	Y
Rep_Area_ID	integer	Reporting Area identity Info	Y
Mode_ID	integer	Mode identity Info	Y

Table 14. **T100_KPI_Definition_Audit**

5.1.15 SQL Table T100_KPI_Frequency

Table below reflects the DB field names, data types and a description of each field.

Field Name	Data Type	Description	Nulls (Y/N)
Rep_Freq_ID	Integer	Actual Internal Number	N
Description	VARCHAR (20)	KPI ID identity number	Y

Table 15. **T100_KPI_Frequency**

5.1.16 SQL Table T100_Rep_Lev_LKP

Table below reflects the DB field names, data types and a description of each field.(Reaing from BI)

Field Name	Data Type	Description	Nulls (Y/N)
Rep_Level_ID	Integer	Actual Internal Number	N
Grouping	VARCHAR (100)	Parent Information	Y
Rep_Parent_level_ID	integer	Reporting Parent Info	Y

Table 16. **T100_Rep_Lev_LKP**

5.2 ERD

Below depicts the Entity Relationship Diagram for the solution.

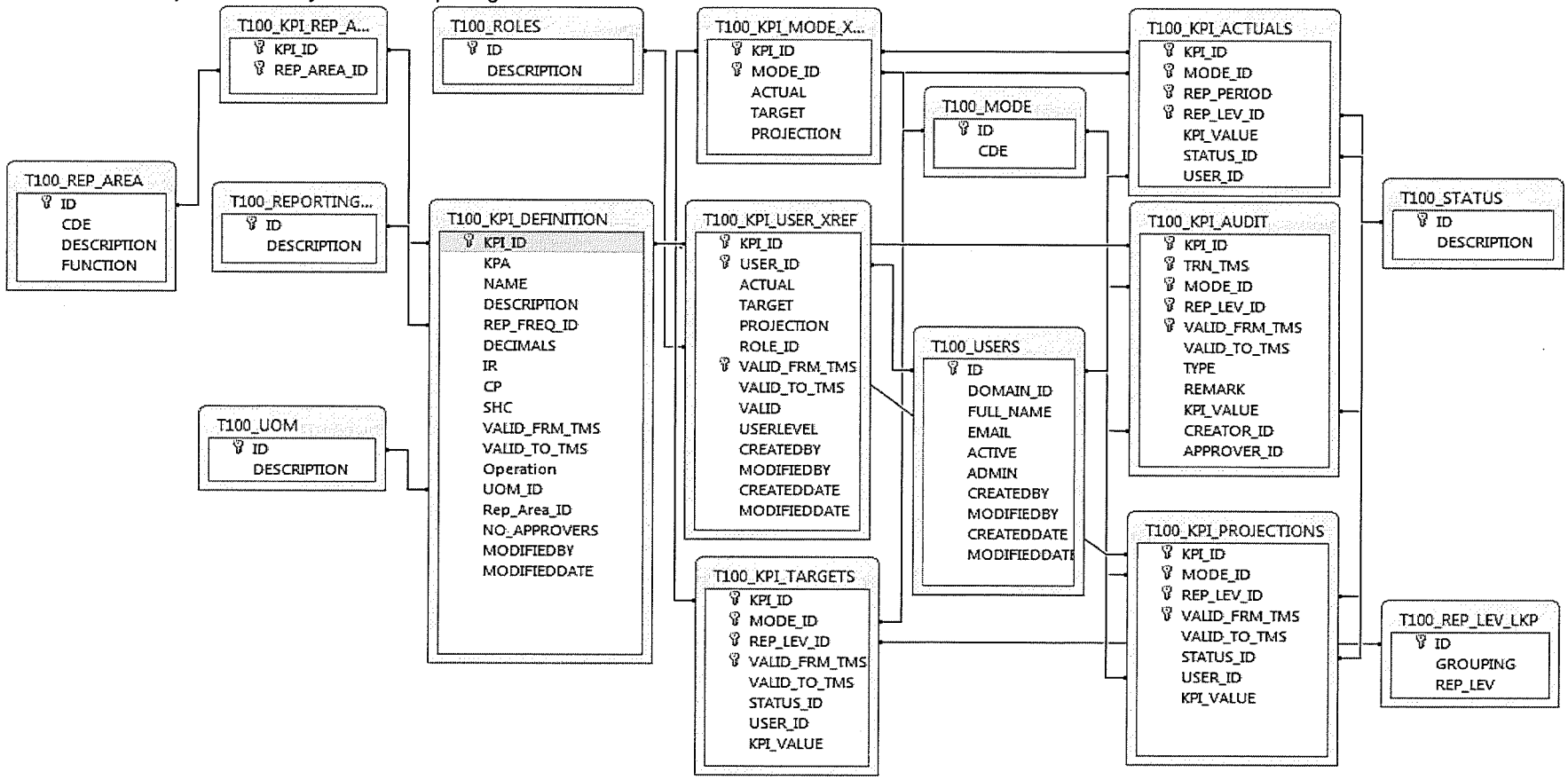


Figure 3: Entity Relationship Diagram

5.3 Object/Application Service Models

No perceived services are offered.

5.4 Stored Procedures

List of all procedure

- CaptureActuals
- CaptureProjections
- CaptureTargets
- CheckModeAssigned
- CheckUserAssigned
- Definition
- GetActualsWorlists
- GetAncestors
- GetCaptureKPI_Actuals
- GetCaptureKPI_Actuals_Reject
- GetCaptureKPI_Projections
- GetCaptureKPI_Projections_Reject
- GetCaptureKPI_Targets
- GetCaptureKPI_Targets_Reject
- GetKPIApproversLevel1
- KPIApproversLevel2
- GetLinkedModeKPI
- GetLinkedUserKPI
- GetNoApprovers
- GetProjectionsWorklists
- GetTargetWorlists
- GetUserKPIsApproved
- GetUserKPIsRejected
- GetUserKPIsSubmitted
- MDM
- SearchKPI

6 Application Architecture

6.1 Application Functional Decomposition

Not Applicable

6.2 Application Strategy - High-Level Design

See section below – Figure 4

6.3 Application Development - Detailed Design

This section covers a detailed design of the system.

6.3.1 Application Overview

This is the backend integration that will make up the functionality of the forms. The figure below shows the technologies involved in the development of the system.

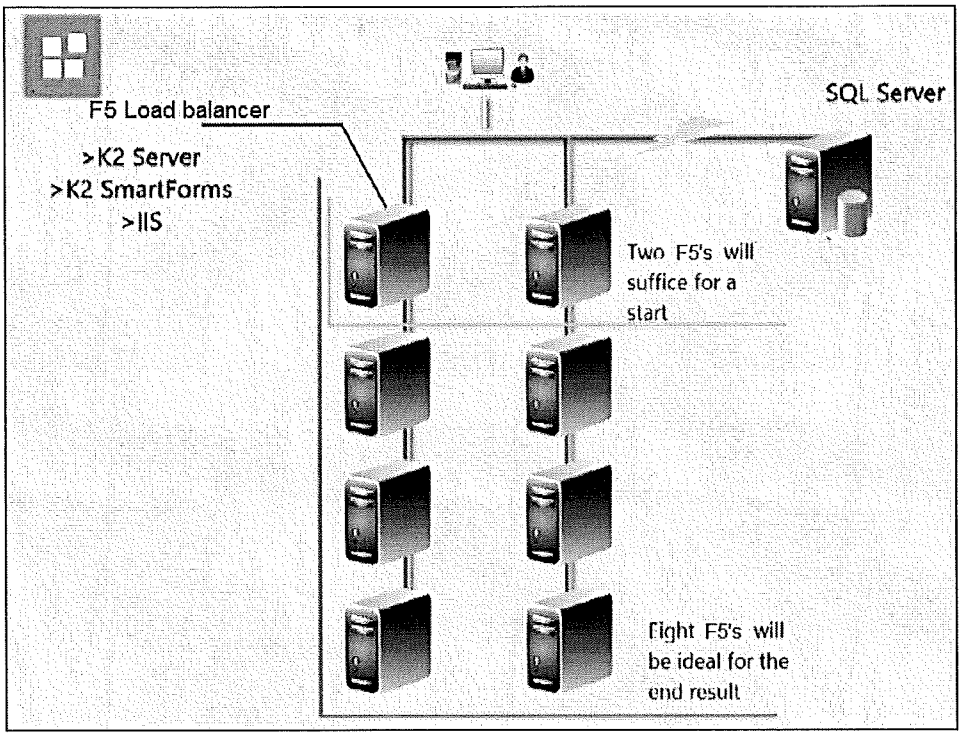


Figure 4: Application Overview

6.3.2 Form Design and Screen Functionality

Figure 6 shows how the form will appear when a user opens it. All fields marked with (*) are mandatory

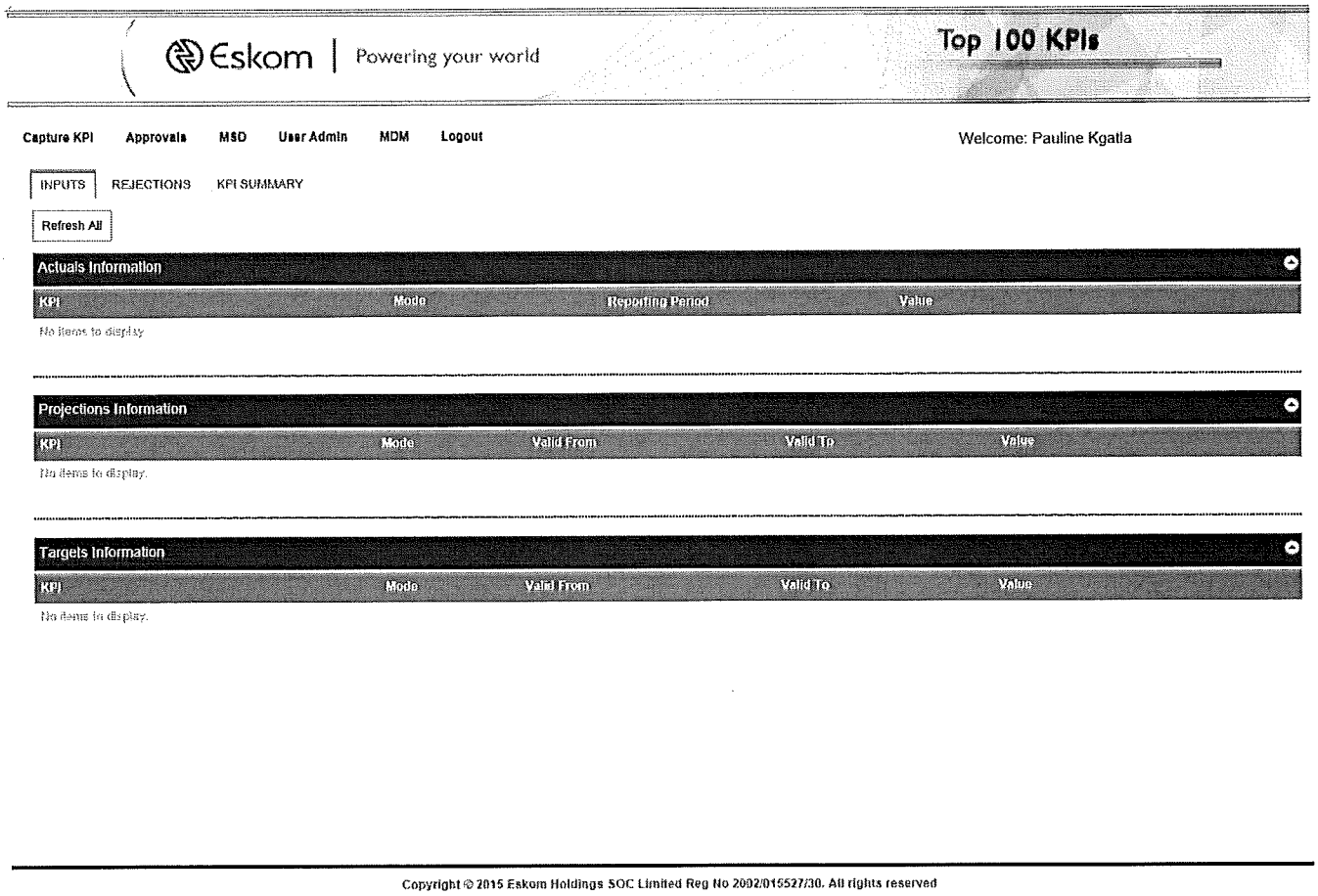
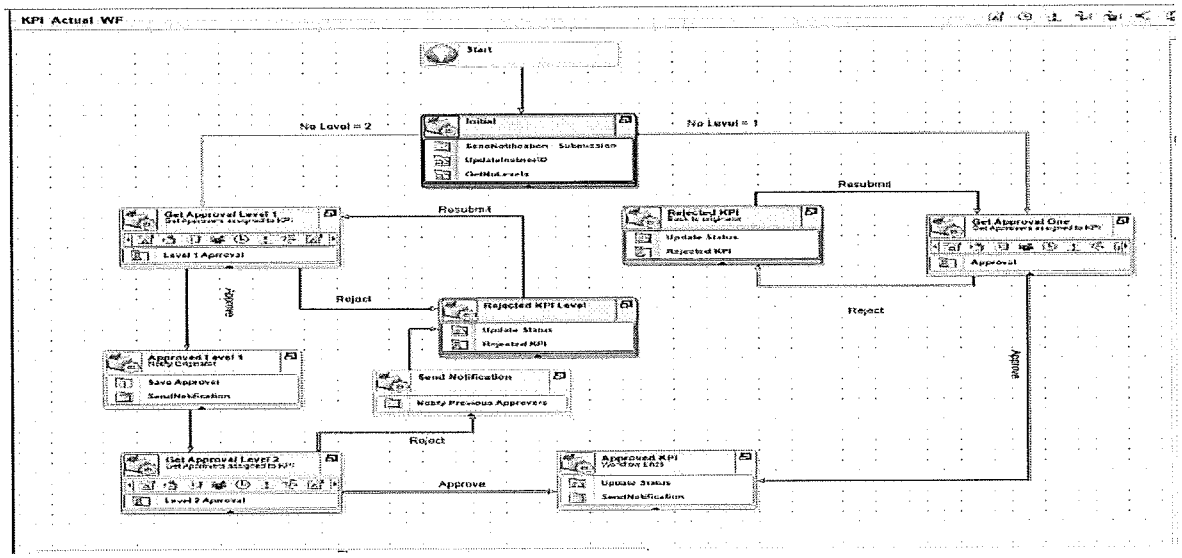


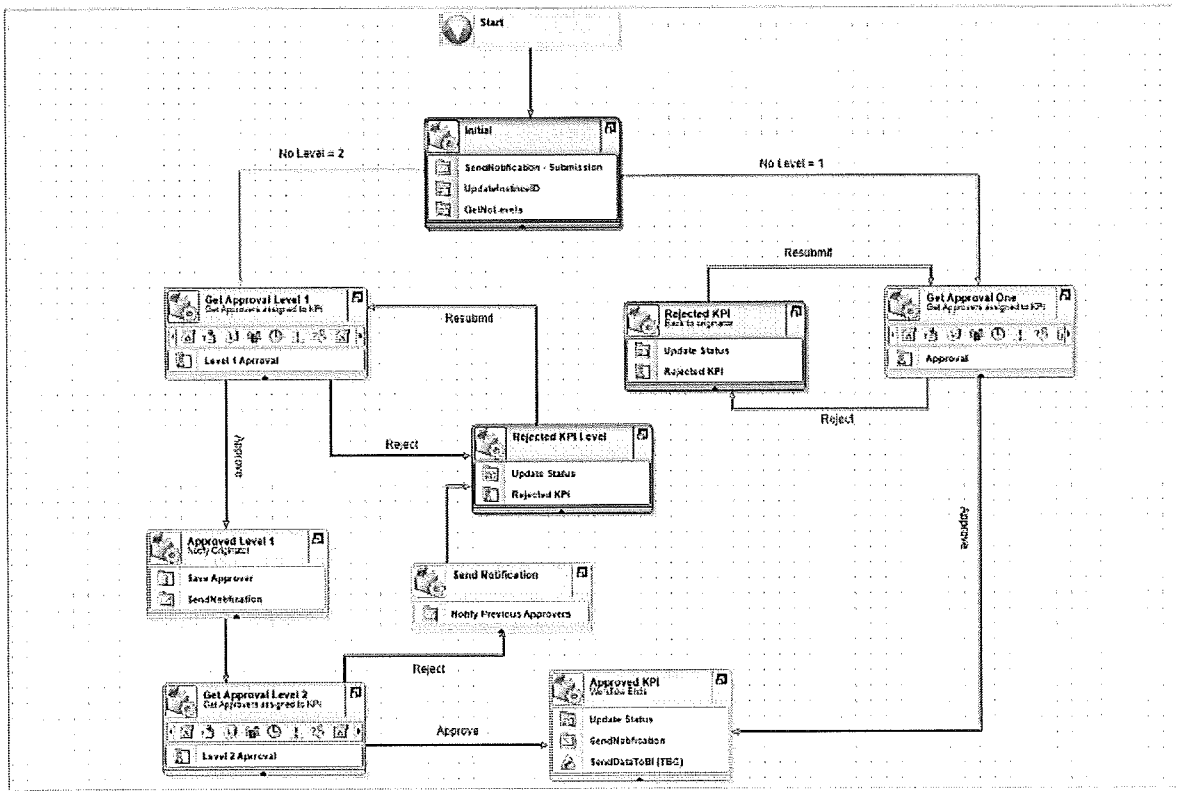
Figure 7: User Screen

6.3.3 Workflow Design and Process Functionality

Actuals



Projections



Targets

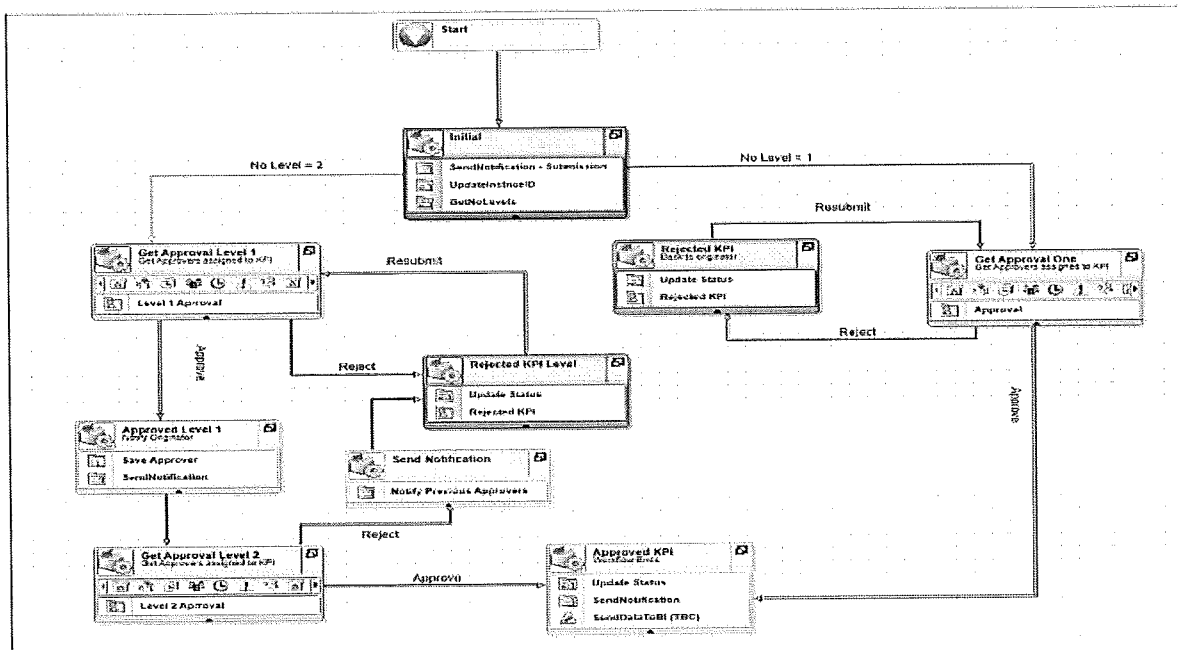


Figure 17 - Workflow Design

APPROVED
Activity Name: Approved
Event Type: Server Event
Action: Set the data field Process Status to "Approved"

REJECTED
Activity Name: Rejected
Event Type: Server Event
Action: Set the data field Process Status to "Rejected"

RESUBMITTED
Activity Name: Resubmitted
Event Type: Server Event
Action: Set the data field Process Status to Resubmited"

Email Notification
Activity Name: Send email when approved
Send email when rejected
Send email when submitted
Send email when resubmitted

7 Technical Architecture

7.1 Applied Technologies

The technologies listed below will be used to implement the solution:

- K2 Black Pearl – workflow engine and business process automation
- K2 Smart Form – for the creation of forms
- Microsoft SQL Database – the backend of the K2 workflow engine
- IIS - Webserver
- Oracle Database
- Active Directory – User management and security
- Microsoft .Net – Additional development
- ODAC

Details of how everything will come together are depicted below.

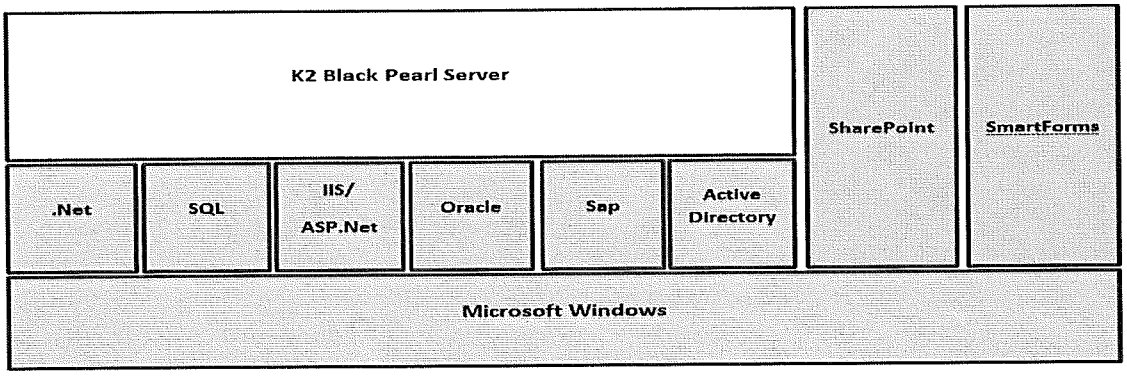


Figure 18 – Technologies

7.2 Basic Infrastructure

The table and figure 9 below depicts the basic infrastructure of the solution.

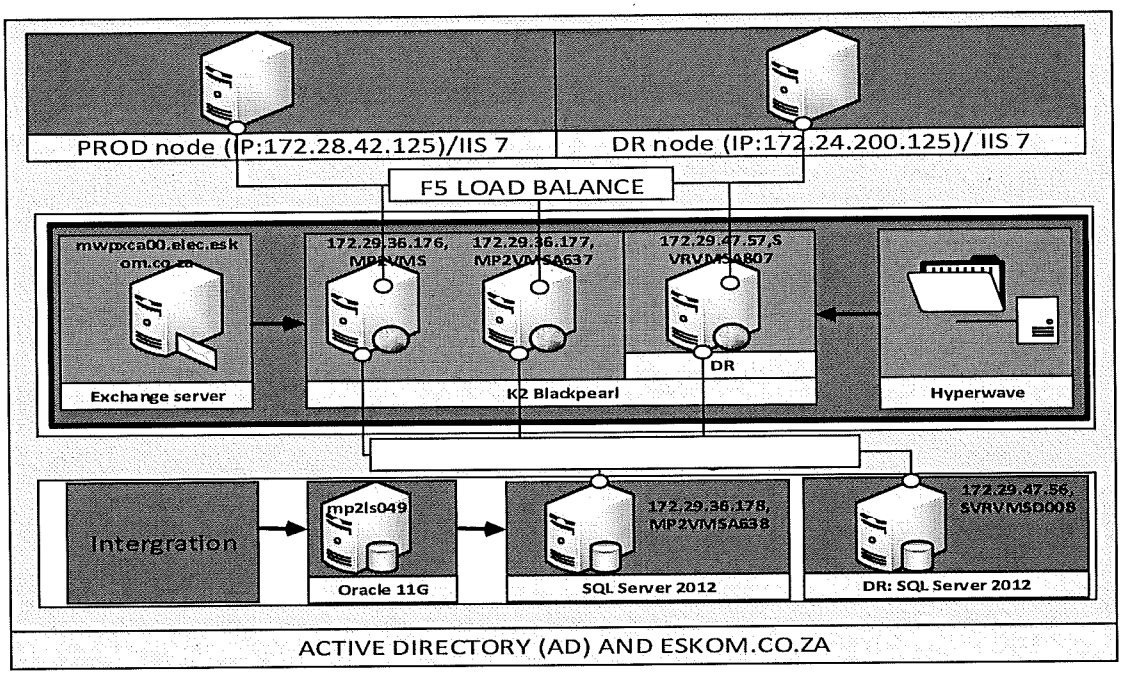


Figure 19 - Infrastructure

AREA	SERVER NAME
Prod Node	IP: 172.28.42.125) / IIS 7
DR Node	IP: 172.24.200.125) / IIS 7, VRVMSA807
Exchanger Server	Mwpxca00.elec.eskom.co.za
K2 Black Pearl	MP2VMS, MP2VMSA637
Hyperwave	
Oracle 11G	MP2IS049
SQL Server 2012	MP2VMSA638

7.3 Technology Standards

No Specific Standards mentioned.

8 Error handling

- Error handling will occur for specific errors to ensure that the Oracle procedures and functions keep running under known conditions. Unexpected errors will trigger standard error handling within the Oracle platform and requires regular monitoring.
- K2 Errors will be automatically logged to a log file on the K2 server.
- On the K2 Process, we will use K2 Error Exception. K2 errors will also be managed and fixed on the K2 Management Portal
- On K2 Smart Forms, rules will be defined to handle errors.
  Smart Object errors are handled internally – Surfaced as SmartObjectException

9 Assumptions

- Changing hardware and software

  The Smart Forms software license will always be available for the duration of the operational life of the proposed solution

- Operating environment

  A new DR environment will be set-up as soon as the pre-transfer is approved

- Availability of information and resources

  Required knowledge and skills needed to maintain and support the system will always be available

10 Dependencies

Technologies and integration of various systems – Oracle, AD, Exchanges, K2 and SmartForms

11 Testing Guidelines

Unit and System/Integration testing will be done.

12 References

12.1 Reference Documentation

Document Title	Location
Top 100 KPI Input Forms **Change Control Reference Number: 1258685** **USVD Reference number: R17640130**	Hyperwave

13 Technical Specification Signoff

This document was reviewed and approved in terms of accuracy and completeness by the following stakeholders:

Role	Name	Date	Signature
Developer	Pauline Kgatla	09/09/2015	
Software Factory Manager			
Release Manager	Ayanda Fuzile	21/09/2015	