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| SEDA LOGO New    **NORBAZ**  **DATA SOLUTIONS** |
| System Analysis Report |
| **Critical Planning Exercise (CPE)** |
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| --- | --- |
| Document | System Design Report |
| Project Name | Critical Planning Exercise (CPE) |
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1. **Executive Summary**

The purpose of this report is to present the proposed system analysis for SEDA, with the intention of ensuring all stakeholders involved agree on the planned solution. The system analysis report is intended for all the project’s major stakeholders: the client-SEDA, the intended system users and the development team.

Firstly, this report will highlight the system’s intended purpose as spelt in the Terms of References (TORs) by expanding on the project description, system capabilities and business benefits.

Secondly, in this deliverable, the system requirements section is used to describe the functionality listed in the system vision and with the use of diagrams allow for all stakeholders to agree on the system requirements. With the use of a functional decomposition diagram the major system for the Critical Planning Exercise have been described and all major functions identified. Alongside this, a conceptual data model (entity relationship diagram) is presented to assist in explaining the main business processes and their relationships. It is expected that this diagram will change throughout the iterative development process.

Thirdly, the project organization section of this report focuses on the system development approach, the team structure, the overall project plan and risk management plan. Ultimately this section will describe how the system development will be approached with both its iterative and incremental nature in each build. A Gantt chart has been included to list the major tasks that will be carried out and the proposed timetable that will be followed. This chart, as a part of the overall project plan, includes the tasks and activities highlighted in the system overview. Alongside this, the risk management plan outlines current risks and possible impact they would have on the project completion. The intention of this section is to ensure all stakeholders are across the incremental development and risks involved with this project.

1. **Project Description**

## 2.1 Client Background

The Small Enterprise Development Agency (Seda) is an agency of the Department of Small Business Development, which was established in December 2004, through the National Small Business Amendment Act, Act 29 of 2004. Seda is mandated to coordinate and provide non-financial support services to potential, aspiring SMMEs through its Branches and Service Providers.

Seda currently has a delivery network compromising of fifty-five (55) service delivery points (Branch Offices), with 500 Business Advisors and approximately 50 Information Officers who use Seda’s existing diagnostic tools. The branches have a support structure of provincial offices and a national office supporting the provincial office network.

Seda Diagnostic Tools are different legacy systems used by practitioners at all Seda delivery points. These tools are managed by the Seda national office as follows:

* Assessment content, standards, certification and utilization—Training and building capacity unit
* Electronic application/system—Business Systems

The Seda Diagnostic Tools are a package of vital applications, which complement the core business operations system, the CRM system, to facilitate and manage client interactions and operations of the provincial delivery network. Diagnostic and Assessment Tools are used to identify areas of weakness in small businesses, including individual entrepreneurs and develop strategies for client business performance improvements. They provide a basis for focused interventions, development and or improvement areas that address the needs of the entrepreneurs or businesses.

One of Seda’s key outcomes is Improved Service Access, through implementing integrated, flexible and responsive systems. The Seda Diagnostic and Assessment Tools support business enablement, process efficiency, thus improving service access. Sound knowledge and experience in system analysis, solutions design, programming, database systems and project management is required to effectively and efficiently deliver the desired solution. To ensure efficiency and productivity for Seda, the Seda stakeholders and clients, Diagnostic and Assessment Tools play a fundamental role in this regard.

## 2.2 Project Description

The Business Planning Framework (CPE) tool is one of the most important basic assessment tools used by Business Advisors at SEDA.

Currently, SEDA has a manual business planning tool, which also has different versions depending on the SEDA branch. The manual tool automatically makes the tool suffer from the natural effects of manual procedures in the days of electronic data gathering, manipulation and retrieval. In essence, this means all business plans are completed manually hence:

* Suffer from non-standardization as different versions exist
* Not saved at any central location electronically, hence cannot be retrieved and assessed easily
* Client data not secure
* Not integrated with the CRM

## 2.3 Functional Requirements

Based on the pitfalls outlined above, there is need to develop a new CPE that will address the following issues:

* Enable effectiveness and efficiency in conducting client & business assessment through electronic platform.
* Create a credible database to ensure centralized management of CPE assessments
* Integrate the CPE database with SEDA’s CRM database
* Ensure improved client assessment tracking and reporting.
* Establish standardized assessment and reporting process
* Maintain the history of assessments submissions for users/clients and enhance user management system.

## 2.4 Non-Functional Requirements

* Enhanced security to ensure correct authentication and authorization of users
* Mitigate risk of client information loss.
* Reliability to ensure that tool will perform the required tasks
* Usability to ensure maximum, flexible and user-friendliness of the tool
* Stability to ensure that the tool is usable with no tolerance to interruptions; and with minimal support required
* Extensibility to ensure that the future growth or modifications can be done easily
* Documentation: user manuals to ensure that the system can be maintained once the industry experience project has commenced

## 2.5 Stakeholders

Of major importance, the system must be designed and developed so as to ensure it addresses the needs of all concerned stakeholders, who include the following:

1. **Clients**

These include the Small Enterprise owners, current and potential, who will be assessed through the tool

1. **Business Advisors/Practitioners**

Business Advisors will use the tool to assess the clients and make recommendations to the Branch Managers

1. **Branch Managers**

Branch managers receive assessments that have been carried out by practitioners at a branch using the tool. They further evaluate the assessments, recommendations and make final submissions for the clients

1. **Provincial Managers**

Provincial managers gather summary reports of assessments that were carried out by all branches in the particular province. They then make strategic decisions based on the findings

1. **Management**

These include any other concerned SEDA business units who directly deal with the functionality of the tool, and those who will require data outputs from the assessments carried out through it.

1. **SEDA Information Technology**

The SEDA IT provides first-line support especially where infrastructural issues are concerned.

1. **Tool Description**

## 3.1 Technologies

The following tools and technologies will be used to develop the Critical Planning Exercise

1. Development technologies
   * Microsoft .NET Core/ .NET 5
   * Entity Framework Core 5
   * Blazor
   * MVC
2. Framework Tools
   * Bootstrap 4
   * Syncfusion Components for Blazor
3. Programming Languages
   * C#, LINQ
   * JavaScript
   * HTML/CSS/Json/xml
4. Webserver
   * Internet Information Services (IIS)
5. Database Management System
   * Microsoft SQL Server

## 3.2 Major Sub-systems (Functional Decomposition Diagram)

**2.0** Add New Assessment

**5.0** Administrative Functions

1. **3.0** Edit/view Existing Assessment
2. **1.0** Authorize & Authenticate

**3.1** Evaluate Assessment

**3.2** Process Final Report Assessment

**4. 1** Write Notifications

**4.2** Read Notifications

**4.2** View/Print /Email Reports

**4.0** Manage Notifications

Business Planning Framework

**Functional Decomposition Diagram Description**

The following is a description of each major function or subsystem from Figure 1.

**1.0 Authorize and Authenticate Users**

Only registered users are able to use the system. This is the security module, and it will be responsible for the following:

* Register user accounts
* Authorize an account
* Deactivate an account
* Reset user password
* Login a user
* Authenticate a user depending on access levels

Please note here that all users registered in this module are only those that are already registered and with valid accounts in the CRM.

**2.0 Add New Assessment**

This module will be used to initiate a new assessment. It is in this module that clients and their business are drawn from the CRM through integration.

Once an assessment has been initiated, it will appear on the list of “My Assessments”, from where other operations can be performed.

**3.0 Edit Existing Assessment**

Once initiated, an assessment maybe carried out in different sessions, so long as it is not yet submitted for the final report. This module will be used to open an existing assessment with the intention to view or edit it; submit for evaluation and finally processing the final report

In this module users will also be able to list assessments, search, filter and sort assessments based on selected criteria, depending on the user’s access level.

**3.1 Evaluate Assessment**

When all mandatory sections of an assessment have been completed, and the Practitioner included their recommendations, the assessment maybe submitted to the Branch Manager for evaluation.

The Branch manager will receive a notification through the internal notification system, regarding the submitted assessment. The Branch Manager will be able to access and review the assessment. Either, the assessment maybe successful, in which case it will closed, or tagged for amendments. This will be included in the BM feedback that will be sent back to the Practitioner for actioning.

This cycle maybe iterated until the Branch Manager closes the assessment and marks it ready for final submission.

**3.2 Process Final Report**

Once the assessment has been evaluated successfully, the final report can then be processed where the client is required to sign.

Once signed, the final report will be attached to the assessment for future references and records keeping. These processes are carried out in this module.

**4.0 Manage Notifications**

The tool will contain an internal messaging system that will allow relevant users to exchange messages outside the usual emailing facilities.

Of main importance, the messaging system is used for communications between Business Advisors/Practitioners and Branch Managers during the evaluation cycles. Branch Managers will send their feedback messages to the practitioners through the messaging system, while practitioners are able to also communicate between themselves.

**4.1 Write Notifications**

Users will be able to write messages to each other. SEDA will define the necessary messaging levels to be allowed in the system.

**4.2 Read Notifications**

This module will allow users to read notifications sent to them and take the appropriate action; being reply, delete or archive.

**5.0 Administrative Functions**

This module will not be used for transactional purposes but for administrative functions aimed at gathering and presenting data relating to other assessments.

**5.1 Print/View/Email Reports**

This module will present interfaces where users are able to enquire the system and obtain detailed and/or summary reports regarding their queries.

Users will be able to print the reports in different formats, and also automatically email the reports to users of the tool.

## 3.3 Assumptions

In designing the Critical Planning Exercise, the following assumptions were considered and hence they affected the nature of the system as depicted above.

* **Appropriate Infrastructure and Software**

Seda has appropriate infrastructure in place to host the tool for testing and production when required. Where particular software is required, it will also be provided.

* **CRM Availability and Reliability**

The tool is highly integrated hence dependent on the availability and reliability of the CRM system. Users, clients, business, branch and province data will be picked, validated and verified against the CRM. Hence the CRM will need to be accessible.

* **Users and stakeholders’ availability**

All key users and stakeholders will need to be available when required so that scheduled activities are executed timeously.

1. **Entity Relationship Diagrams (Database snapshots)**

The diagram below shows the relationships of the main entities that are used in the tool. Notice that some entities are being extracted from the CRM, while the rest are resident in the Critical Planning Exercise.

Please refer to the legend under the illustration to interpret the relationships.

(**CRM**)

Users

(**CRM**)

Branches

(**Tools**)

Advisor

(**Tools**)

Tool Types

(**Tools**)

Assessment

(**CRM**)

Person

(**CRM**)

Provinces

(**CRM**)

Businesses

(**Tools**)

Assessment Details

(**Tools**)

Assessment Evaluation

(Tools)

Final Report

|  |  |
| --- | --- |
| Cardinality Legend | |
|  | One to Many |
|  | One to One |
|  | Many to Many |

1. **Proposed System Architecture Overview**

The diagram below aims to depict the overview of the CPE tool interfaces and functional modules. Please refer to the table in the “Design Specifications” section that follow for brief explanations of the activities that will be performed under each module.

Help

Manage Account

Sign Out

Login

Register

Reset

Activate

Tools Home

Add New Assessment

Edit/View Assessment

Manage Notifications

Admin Functions

Opening Balances

Sales

Expenses

VAT

Assumptions

Company Info.

Debtors

Creditors

VAT

Stock

Assumptions

Submit For Evaluation

Review Eval Feedback

Close Assessment [Final Report]

Credit Business

Cash Business

Admin Ops

1. **Design Specifications Details**

Table below contains the design specification details for each of the modules specified in the architecture above (Part 5).

|  |  |  |
| --- | --- | --- |
| **ITEM** | **MODULE** | **COMPONENT DESCRIPTIONS** |
| **1.0** | **Housekeeping and System Security** | |
| 1.1 | Interface Components | * User registration CRUD forms * Login forms * Password reset CRUD forms * User Authorization and Authentication CRUD forms |
| 1.2 | Database Components | * SEDA CRM integration API views * Authorization and Authentication data structures (use .NET Core security) entities * Track and maintain Audit-Trail entities |
| 1.3 | Logic/Intelligence Components | * Setup and Initiate user sessions * Manage Cache * CRUD REST-APIs: Update audit -trail * CRUD REST-APIs: Authenticate and authorize user (Activate account) * CRUD REST-APIs: Register user * CRUDE REST-APIs: Recover/reset passwords * Show options and features based on user(authenticated) |
| **2.0** | **Home page (Authenticated user)** | |
| 2.1 | Interface Components | * Options menu components * Display existing assessments * Search assessments * Fitter and sort assessments by different criteria * Register new assessment * View messages (internal messaging system) * Respond to notes (internal messaging system) * User sign-out * System Help components |
| 2.2 | Database Components | * Structure to maintain session state for logged user |
| 2.3 | Logic/Intelligence Components | * Update Cache * Persist user session * Update audit trail based on user activity * CRUD REST-APIs: create new assessment * CRUD REST-APIs: manage internal messages * CRUD REST-APIs: respond to internal messages |
| **3.0** | **Assessment Home Page** | |
| 3.1 | Interface Components | * Display assessment sections menu component * Show assessment summary * Show overall progress and status of assessment * Show Financial-Health Summary graphs * Show Cash-Flow forecast summary * Show Profit for Period summary * Opening Balances CRUD forms * Debtors CRUD forms * Creditors CRUD forms * WHAT-IF scenarios CRUD form * Display validations options (if assessment submitted) |
| 3.2 | Logic/Intelligence Components | * Update Cache * Persist user session * Update audit trail (indicate assessment selected) * CRUD REST-APIs: Current scenario * CRUD REST-APIs: Opening Balances * CRUD REST-APIs: Debtors * CRUD REST-APIs: Creditors |
| 3.3 | Database components | * Scenario entity * Creditors’ entity * Debtors’ entity * Opening Balances entity |
| **4.0** | **Assessment Sections**  There are twelve (12) sections that must be completed by the user before the assessment can be ready for submission, to be validated by the Branch manager. | |
|  | \*\*\* Detailed component designs for individual sections will be availed in later versions of this design specification following continuous consultations. | |
| 4.1 | Company Background | |
| 4.2 | Company Information | |
| 4.3 | Detailed Sales | |
| 4.4 | Detailed Debtors | |
| 4.5 | Detailed Income | |
| 4.6 | Detailed Expenses | |
| 4.7 | Value Added Tax Calculations | |
| 4.8 | Detailed Stock | |
| 4.9 | Assessment Assumptions | |
| 4.10 | Coaching and Training | |
| 4.11 | Administrative Functions and Reports | |
| **5.0** | **Administrative** | |
| 5.1 | Interfaces | * Draw summary report (responses) * Draw final report (adjudicated) * Submit assessment for validation by Branch Administrator * Read Administrator feedback (internal messaging system) * Respond or checkout Branch Administrator feedback (internal messaging system) |
| 5.2 | Database Components | * Track assessment validation entity * Branch Administrator Feedback entity * Internal messages entity |
| 5.3 | Logic/Intelligence Components | * Update Cache * Persist user session * CRUD REST-APIs: Track assessment validation/submission * CRUD REST-APIs: Internal messages |
| **6.0** | **Branch/Provincial/National Manager Portal** | |
| 6.1 | Interfaces | * View all applicable assessments * Search applicable assessments * Filter applicable assessments * Sort applicable assessments * Update assessment feedback to user(practitioner) * Print applicable assessments |
| 6.2 | Database Components | * Assessment Feedback entity |
| 6.3 | Logic/Intelligence Components | * Update Cache * Verify and Persist user session * CRUD REST-APIs: Branch Administrator feedback * CRUDE REST-APIs: Messages to relevant users |

1. **System Development Approach**

In planning the development of the Business Planning tool, we will largely use the traditional Systems Development Life cycle SDLC.

However, due to the complexity of the application and the restricted time limit now at hand, we may apply the Agile approach while carrying out some phases.

The Agile development methodology provides opportunities to assess the direction of a project throughout the development lifecycle. This is achieved through regular cadences of work, known as sprints or iterations, at the end of which we will present a potentially shippable product increment. In this agile paradigm, every aspect of development – requirements, design, etc. – is continually revisited throughout the lifecycle. Every time we finish a cycle, we stop and test with our client and then get feedback so we can make changes if needed. Otherwise, the project may not go towards the right direction.

1. **Human Resources**

Below is the list of personnel who will be dedicated to work on the project. In the case that more personnel are required, we will gladly provide.

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Resource Name** | **Role** | **Contact** |
| 1. | Zabron Muyambo | Lead Developer/Project Manager | zabronm@ndsolutions.co.za |
| 2. | Thato Samuel Magana | Developer/System Engineer | Thato.magana@ndsolutions.co.za |
| 3. | Lawrence Mucheka | Developer/Documenter | lawrence@ndsolutions.co.za |

1. **Project Plan**

The tasks and projections in the Gantt chart below are from the initial project plan. We may make changes to the project according to further information given SEDA where it may divert from the initial requirements. The projections may also be affected by any changes in the assumptions as indicated in the project risks below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID | TASK | JAN -FEB | MAR/APR/MAY | JUNE/JULY | AUG/SEP/OCT | NOV/DEV |
| 1. | Project planning |  |  |  |  |  |
| 2. | Requirements Analysis |  |  |  |  |  |
| 3. | Tool Designs  Interfaces, Database APIs, Programs, |  |  |  |  |  |
| 4. | Development  Interfaces, APIs, Programs |  |  |  |  |  |
| 5. | Testing |  |  |  |  |  |
| 6. | Implementation |  |  |  |  |  |
| 7. | Project Hand-over & Sign-Off |  |  |  |  |  |

1. **Project Risks and Mitigation**

We outline some of the most common project risks that may be encountered.

|  |  |  |  |
| --- | --- | --- | --- |
| ITEM | RISK | DESCRIPTION | Mitigation |
| 1. | Changing requirements | Requirements may be added during the course of the project. | Document changed requirements, discuss and note implication to deadlines before undertaking |
| 2. | Availability of personnel resources – Development personnel | Adequate developer resources need to be available at all times as speculated. | Follow procedures as stipulated in the Service Level  Agreement |
| 3. | Availability of personnel resources - SEDA | We will be doing a lot of participatory development and the constant reviews and feedback of the SEDA team will be crucial in certifying the developed modules as well as moving forward.  In some cases, SEDA personnel will be required for bureaucratic protocols; hence their absence may delay the project. | Escalate to project Leader |
| 4. | Availability/Reliability of infrastructure for testing and deployment | IT infrastructure is expected to be always available and reliable to enable us to publish the developed modules of the tool both for testing and production.  If not available, the deliverables may be delayed | Escalate to project Leader |
| 5. | Availability of proper software | Proper software on the hosting servers will need to be made available timeously | Escalate to project Leader |
| 6. | Availability of CRM | Almost all transactions are verified against existing data from the CRM. That means the CRM is expected to be accessible at all times for the tool to work | Escalate to project Leader |
| 7. | Breach of contract | Contract may be breached by either side of the involved parties | Follow procedures as stipulated in the Service Level  Agreement |

1. **Consent and Signatures**

**Project Title:** Design and Development of the Critical Planning Exercise

**Start Date:** 01/01/2021

**Expected Completion Date:** 31/12/2021

**Project Duration:** 12 months

|  |  |  |
| --- | --- | --- |
| Client Representative (SEDA) | | |
| Name: | Signature: | Date: |
|  |  |  |
| Client Witness (SEDA) |  |  |
| Name: | Signature: | Date: |
|  |  |  |
| Developer Representative (ND Solutions) | | |
| Name: | Signature: | Date: |
|  |  |  |
| Developer Witness (ND Solutions) | | |
| Name: | Signature: | Date: |