PES UNIVERSITY, BANGALORE

Department of Computer Science and Engineering

Software Requirements Specification

for

Kulaabhooshanam – A Child Adoption Portal

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version
Version 1.0	13 – 09 - 2023		

Introduction

Purpose

Kulaabhooshanam is a robust online platform for child adoption in India. Through this portal we aim to tackle one of the most pressing issues in the country, that of homeless children. India has more than 30 million orphaned and abandoned children, of whom less than 370 thousand have made it to institutionalized care and only around 3500 are adopted annually. 11 million have been abandoned in public places like trains, toilets, garbage bins or in forests left to traffickers and to animals and large birds of prey despite the presence of a legal system in place. One of the biggest factors that influence this trend is the social stigma attached to unwanted births and their abandonment that pushes biological parents to stealthily leave their children in such places. Contrastingly, the Consensus of July 2022 names more than 30000 prospective parents who have been awaiting an adoption referral for a minimum of 2 years. The main reason for this social disparity is the extremely tedious process of application and verification for Adoption in India. Adoption in India is a legal affair authorized by the Central Adoption Resource Authority (CARA), Ministry of Women and Child Development, Government of India.
Kulaabhooshanam portal has thus been proposed in order to enable The Government of India to bridge this gap between the adoptive parents and their children while also providing a secure environment for unwanted babies.
This document describes the entire software requirements of the Version 1.0 of this product.

Intended Audience

This document is intended for the developers, the development team, project managers and the management team. It also serves as a working reference for the documentation team. It describes the portal, its features and their software requirements in detail.
The rest of the document has been ordered as follows. Divisions 1 through 5 describe the functional requirements. Product scope enlists the various functions and their intended users, the long and short term goals and the trajectory of the project. The objectives of the product have been elicited under division Objectives that includes the product functioning, their operating environments, the constraints in design and implementation and the assumptions and dependencies. The division External Interfaces describes the user interfaces, software and hardware used in the product. division 4 contains analysis models, ER diagrams, Design Diagrams, Work Flow Diagrams and Use Case Diagrams. Section 5 Describes each feature provided by this product with accurate details. Further divisions describe the non-functional requirements like data security and quality attributes.

Product Scope

Kulaabhooshanam, online portal for child adoption in India, stands as a beacon of hope in a nation grappling with the heart-wrenching issue of homelessness among children. With over 30 million orphaned and abandoned children, the software’s primary goal is to bridge the chasm between the children and more than 30,000 eager

prospective parents awaiting an adoption referral. By simplifying the adoption process, Kulaabhooshanam strives to eradicate the social stigma surrounding unwanted births and child abandonment, offering a secure haven for infants and young ones. The initiative not only aligns with the government objectives but also highlights the ethical responsibility to safeguard the well-bring and future of these children, fostering a brighter, more compassionate India.

References

https://www.snehalaya.org/adoption

https://balashatrust.org/

Legal Information reference:

https://cara.wcd.gov.in/Parents/eg_ri.html

https://vikaspedia.in/social-welfare/women-and-child-development/child-development-1/child-adoption/overview-of-child-adoption-process-in-india

Overall Description

Product Perspective

In India, there are more than 30 million orphaned and abandoned children. Many of them will be left alone in unsafe public spaces, despite several legal procedures in place. The parents who wish to adopt a child end up waiting for more than 2 years. The sole reason for this is the plethora of applications that need to be filled out by them. This further leads to very few children getting adopted. It is observed that 3500 are adopted annually.

The child adoption management system - Kulaabhooshanam - proposes to eliminate some of the difficulties caused by such a system in place. This will not be a replacement for the existing systems in place but will act as a solution to some of the problems faced by the people. It comprises a centralized server-based architecture that stores the critical adoption information, users' preferences, and adoption agency details. The fast updation of a child's status ensures that the data is always up-to-date and relevant. This is a standalone project. It does not have any direct dependencies as such but only that it must work correctly in different browsers. There are no hardware or software dependencies beyond these including, but not limited to, memory or specific software packages that need to be utilized.

Product Functions

- Storage of data:
    - Various details are stored such as the parents', children, and adoption agency's information.
    - Updating: Adoption agencies can update the status of the child that's in-house.

- Initial registration and authentication:
    - Allows the user to create their account or login in order to view their adoption status and other details
- Giving up for adoption:
    - Facility to anonymously fill out a form

- Applying for adoption:
    - Interested parents can apply for adoption by filling out a form detailing the necessary information.
- Mapping the child to the parent:
    - Post application, the child gets mapped to the prospective parents.
- Testimonials:
    - Users can see the success stories of adopted children.
- Customer support:
    - Extended chat-based service to ease the adoption process for users.

User Classes and Characteristics

Prospective Parents (Primary End Users)
Frequency of use: They will interact with the application as needed. So occasional usage.
Product functionalities used: Authentication, filling out applications for the adoption process.
Technical expertise: Users could have any level of expertise - either tech-savvy or may not use computers much.
Security or Privilege Levels: These users will have to get authenticated and only after that they would be able to apply for adoption. The only access allowed is to view some of the details of the child and that of the adoption agency.
Experience: The users could be experienced adoptive parents or could be applying for adoption for the first time.

Adoption Agency Members
Frequency of use: These users would be more frequent users.
Product functionalities used: Updating the child's information and processing the applications of interested parents. They will also determine which parent-child mapping will lead to long-term success.
Technical expertise: Users could have any level of expertise moderate or high, depending upon their role and also the kind of training they have received.
Security or Privilege Levels: These users will have heightened privileges that give them access to the crucial data of the children - both in-house and adopted. They will have the prospective parents' details at hand too.
Experience: These users are experienced adoption professionals with in-depth knowledge of adoption procedures.

Those giving up the child for adoption
Frequency of use: Usage would be comparatively lesser than all the other users.
Product functionalities used: They would fill out an application form regarding the child's details.
Technical expertise: Users could have any level of expertise - either tech-savvy or may not use computers much.
Security or Privilege Levels: They will have limited access, can only fill out the form

Admins
Frequency of use: These users will be regular users as they will constantly be managing the user profiles and other updates.
Technical expertise: High

Security or Privilege Levels: These users will have complete access to all of the sensitive data of the organization as well as the adoptive parents.
Experience: The users will be experienced in system administration and handling security concerns and integrity.

Operating Environment

- Database Server: This stores the information about the adoption agencies, the children associated with the agencies, and the prospective parents seeking to adopt a child.
- Network: Reliable network connectivity is needed with proper bandwidth. Network protocols like HTTPS and HTTP are needed.
- Devices: Users can access the application from any device, SO the application has to be responsive and accessible to its users.
- Web Servers: May rely on web server software to serve HTTP requests.
- Web browsers: Users will interact with a variety of browsers like Chrome, Edge, Mozilla, and others. The software must be compatible with all these.

Design and Implementation Constraints

Hardware limitations

- Timing requirements: Software must respond to the user's requests within 5 seconds for most operations

Specific technologies and tools

- Nextjs (v13) has been extensively used for server-side rendering and components
- MySQL is used for database management to store and update data. This will guide the database schema and the design

Security considerations

- All user data must be efficiently stored in the database and should only be accessible to authorized staff like Admins

Maintenance

- Diligent maintenance must be done after the initial development.

2.6 Assumptions and Dependencies

Environment assumptions:

- There will be proper network connectivity and sufficient server resources in the development and production phases.

External Factors:

- It is assumed that there will not be any monumental changes in the adoption rules while we are in the development phase

Dependencies:

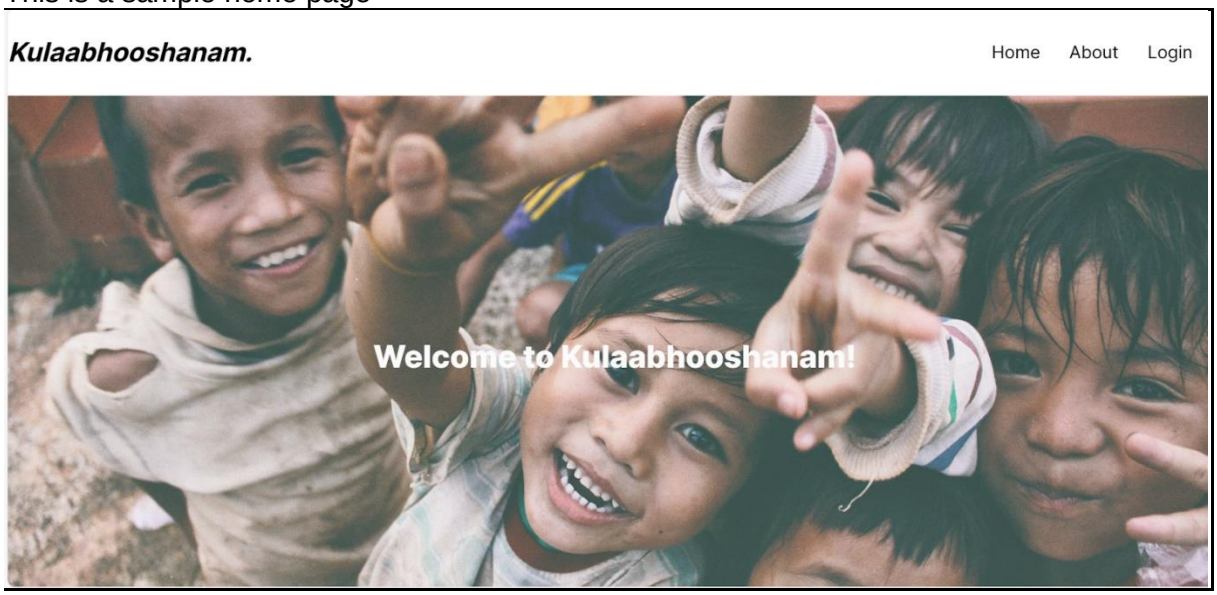
- Users are authenticated and have a unique password
- The server must be running for the website to function

External Interface Requirements

User Interfaces

This product is a website for prospective parents and adoption agencies. The interface for communicating with users is a browser web client. Different users can access different levels of stored information based on their authority. External user interfaces include leveraging the power of Chat GPT via OpenAI API in order to provide a method to communicate with and answer user queries.

This is a sample home page



Software Interface

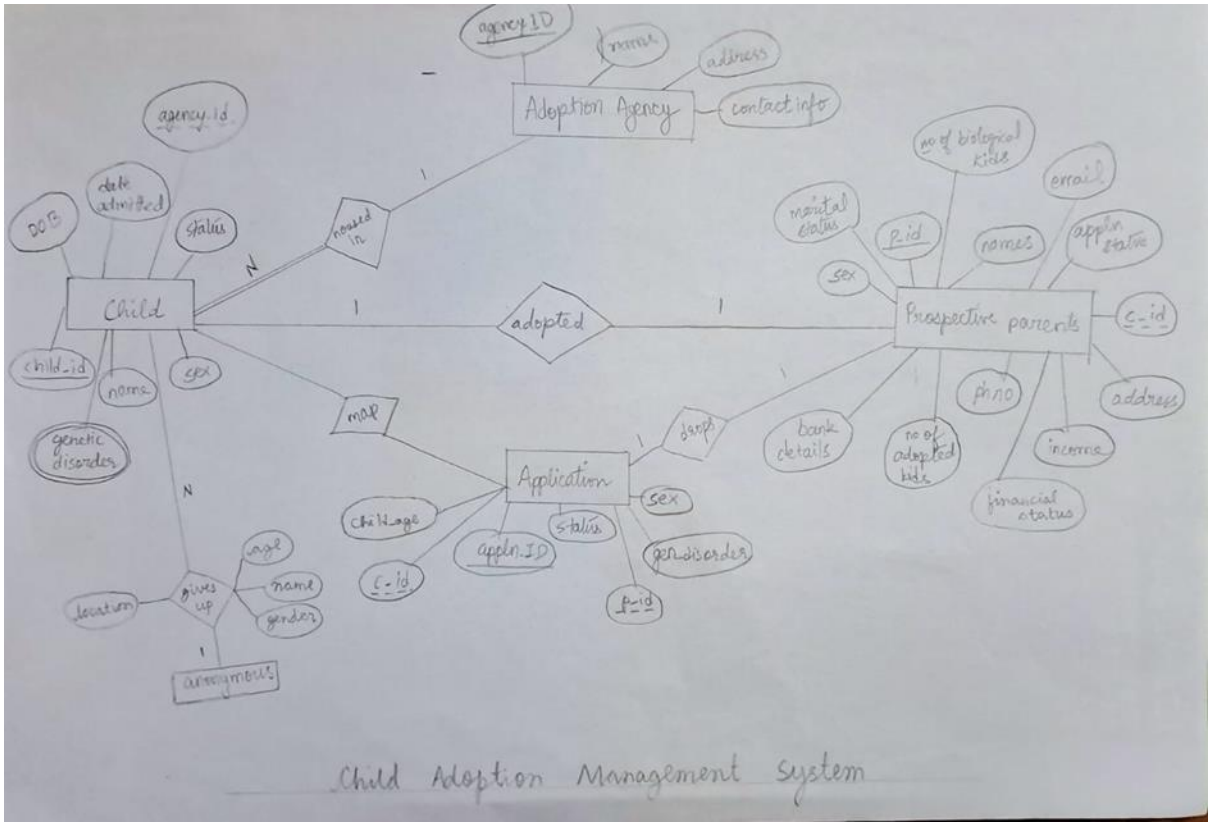
This product had been designed for cross platform compatibility. It is compatible across all operating systems that provide a browser client interface to access the website. The server runs on MySQL Database. Libraries used to avail the connectivity to the database include middleware and next.js API calls. OpenAI API used to avail OpenAI Chat GPT services. The server is centralized and stored on a single file system. The different levels of users are provided with different levels of access to the information in this datastore.

Communications Interfaces

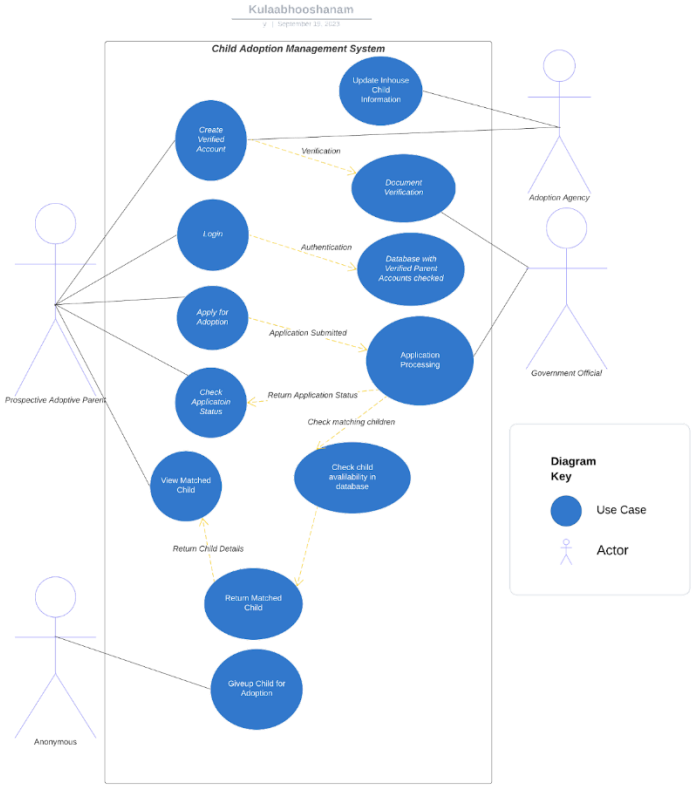
This product runs on the secure HTTPS web service with REST API to communicate with the centralized database server. OpenAI API is also used in a secure environment to communicate with the OpenAI server

Analysis Models

1. ER Diagram for the Child Adoption Management System - Kulaabhooshanam



2. Use case diagram



System Features

Initial User Registration and Authentication

5.1.1 Description and Priority

The users must create an account or existing users can log in to their account. Only after authentication, users will be able to apply for adoption. Priority: High

5.1.2 Stimulus/Response Sequences

On the home page, the user clicks on the Login button on the navbar. Then, the user is redirected to the authentication page. Here, the user should enter the prompted details and click on the submit button. This data is then sent to the system, which validates the data and then adds it to the database. So, the user account gets created.

5.1.3 Functional Requirements

- Requirement 1: When the user submits the registration form, the system shall validate that all required fields are filled out.
- Requirement 2: If any validation errors occur (e.g., invalid email format), the system shall display error messages next to the respective fields.
- Requirement 3: Once the registration is successful, a success message is displayed on the screen

Child’s Information

5.2.1 Description and Priority

The child's information could be added in many ways -

- The adoption Agency staff can add the child's relevant data
- If someone is giving up the child for adoption, they will enter the child's relevant details into the form.

Priority: High

5.2.2 Stimulus/Response Sequences

Adoption agency staff enters the relevant data manually into the system. In the other case, whenever someone wishes to give up a child for adoption, they will fill up a form and then click on the submit button. This data is sent to the system and the data is added to the database.

5.2.3 Functional Requirements

- Requirement 1: Once the user clicks on the submit button, the system validates the data and updates the database
- Requirement 2: If any error in validation occurs, an appropriate message is displayed on the screen

Application Form Details

5.3.1 Description and Priority

Authenticated users will be eligible to apply for adoption. They will be prompted to fill up a form with the relevant details.

Priority: High

5.3.2 Stimulus/Response Sequences

On the home page, the interested parents click on the Apply Now button. Then, they are redirected to fill up a form. Upon submitting, their data then gets updated in the database. Based on this, they get mapped to a child.

5.3.3 Functional Requirements

- Requirement 1: Once the user clicks on the submit button, the system validates the data and updates the database
- Requirement 2: If any error in validation occurs, an appropriate message is displayed on the screen

User testimonials

5.4.1 Description and Priority

Displays the success stories of numerous parents with adopted children.

5.4.2 Stimulus/Response Sequences

User testimonials are displayed on the screen of the application

Customer Support

5.5.1 Description and Priority

A chatbot will assist the users with any queries they might have on adoption.
Priority: Medium

5.5.2 Stimulus/Response Sequences

The user clicks on the chatbot on the screen. So they can now interact with the chatbot through text messages and resolve their queries.

5.5.3 Functional Requirements

- Requirement 1: The chatbot must incorporate NLP capabilities to understand and interpret user queries.
- Requirement 2: The chatbot must be integrated with the knowledge of adoption-related topics

- Requirement 3: The chatbot should provide a user-friendly and responsive interface.

Other Nonfunctional Requirements

Performance Requirements

- **Response Time**: The system must respond to user requests within 5 seconds for most operations, ensuring a smooth and efficient user experience
- **Scalability**: The application should be designed to handle a significant increase in users and data without a significant drop in performance
- **Concurrency**: The system must support concurrent access by multiple users without data conflicts or performance degradation.

Safety Requirements

Data Safety: User data and sensitive information, including adoption agency details and child profiles, must be securely stored and protected from unauthorized access.

User Privacy: The system must adhere to privacy regulations and ensure that user data is kept confidential. Only authorized personnel, such as administrators, should have access to sensitive information.

Child Welfare: The system should prioritize the safety and welfare of children. Any information related to children should be handled with the utmost care and sensitivity.

Security Requirements

- **User Authentication**: User authentication should be robust, requiring strong passwords and secure authentication protocols to prevent unauthorized access.
- **Data Encryption**: All data transmission over the network, especially sensitive data, must be encrypted using secure protocols (e.g., HTTPS) to prevent eavesdropping.
- **Access Control**: Role-based access control should be implemented to ensure that users have access only to the data and functions relevant to their roles.
- **Regular Audits**: Regular security audits and vulnerability assessments should be conducted to identify and address potential security threats.
- **Protection Against SQL Injection**: The system must be protected against SQL injection attacks to prevent unauthorized database access.
- **Data Backup**: Regular data backups should be performed to prevent data loss in case of system failures or security breaches.

Software Quality Attributes

- **Usability**: The user interface should be intuitive and user-friendly to accommodate users with varying levels of technical expertise. Usability testing should be conducted to ensure an optimal user experience.
- **Reliability**: The system should be highly reliable, with minimal downtime, to ensure that users can access critical information and services without disruption.
- **Maintainability**: The software should be designed with maintainability in mind, making it easier for developers to update and enhance the system as needed.
- **Scalability**: The architecture should support scalability to accommodate a growing user base and increasing data volumes.
- **Interoperability**: The system should be designed to integrate with other relevant systems and databases, ensuring seamless data exchange and compatibility with future technologies.
- **Robustness**: The system should be robust and resilient, handling unexpected errors or inputs gracefully without crashing or compromising data integrity.
- **Performance**: The system should perform efficiently even under heavy loads, ensuring a responsive user experience.

Business Rules

Chief operators of this product include the primary end users, prospective adoptive parents, parents who wish to anonymously place their children in institutional care, legally registered adoption agencies and administrative staff from the CARA, Ministry of Women and Child Development, Government of India. Administrative users have heightened privileges on the database server and can view all children, parents, applications and adoption agencies along with all their attributes. They alone hold the privilege of verifying parental, adoption agency, and child documents and details, conducting pre adoptive in person checks and are responsible for post adoptive surveys. Adoption agencies once authorized by the admin can provide details about the children present in their care, details again subject to thorough cross checking by the admin. They cannot view parent details, and applications until a child in their institution is places with any parent. They do not have privileges to view other agencies or change any data on the server, besides their own. Prospective parents can create a verified account, submit a single application form at a time and can only retrieve the status of their application. They can only view the child whom they have been placed with, once their documents are verified and application has been processed and accepted. People willing to place a child with any adoption agency have very limited privileges, they can only fill up a form which asks them for a description of the child and the location at which it has been left

Other Requirements

- Database Requirements: The system must rely on a robust and scalable database system, such as MySQL, to efficiently manage and store critical data. This includes user information, child profiles, adoption agency details, and application records. To ensure data integrity and availability, the system will schedule regular automated backups of the database.

- Internationalization Requirements: Given India's linguistic diversity, the application shall support multiple languages to cater to users from various linguistic backgrounds. Future updates may involve translation and localization efforts to make the platform accessible to a wider audience.

- Legal Requirements: The system must comply with all relevant adoption laws and regulations in India, particularly those set forth by the Central Adoption Resource Authority (CARA) and other governing bodies. Additionally, the platform must adhere to data protection and privacy laws, ensuring the security and confidentiality of user information while obtaining proper consent for data processing. Child protection laws and ethical considerations must also be paramount.

- Reuse Objectives: The architecture and codebase of the software shall be designed with modularity and reusability in mind. This approach will facilitate future updates, extensions, and the potential reuse of components in other projects.

- Accessibility Requirements: To promote inclusivity, the user interfaces of the application will adhere to web accessibility standards, such as WCAG. This ensures that individuals with disabilities can effectively access and utilize the platform.
- Performance Monitoring: The system will undergo regular performance monitoring and profiling to identify areas for optimization and potential bottlenecks. This proactive approach will help maintain responsiveness and reliability as the user base grows
- Documentation: Comprehensive documentation is essential. User documentation, including user guides and FAQs, will be provided to assist users in navigating and understanding the platform. Developer documentation will also be maintained to aid system maintenance, updates, and troubleshooting for the development team

- Testing and Quality Assurance: A comprehensive testing plan will be developed to cover all aspects of the system, including functional, usability, security, and performance testing. Rigorous quality assurance processes, such as code reviews and testing procedures, will be implemented to ensure the software's reliability and stability.

- These additional requirements contribute to the holistic development of the Kulaabhooshanam platform, addressing database management, legal compliance, internationalization, accessibility, and quality assurance to deliver a comprehensive solution for child adoption in India.

Appendix A: Glossary

SRS: Software Requirements Specification - A document that outlines the functional and non-functional requirements of a software system.

CARA: Central Adoption Resource Authority – The Government agency in India responsible for regulating and monitoring adoption activities.

User Interface: The point of interaction between users and the software, including screens, forms, and navigation elements.

MySQL: An open-source relational database management system that's used for storing and managing data in the application.

WCAG: Web Content Accessibility Guidelines - A set of guidelines and standards for making web content more accessible to people with disabilities.

ER Diagram: A type of flowchart that illustrates how 'entities' such as people, objects or concepts relate to each other witing a system

Use Case Diagram: A way to summarise details of a system and the users within that system. It is generally shown as a graphic depiction of interactions among different elements in a system.

Data Backup: The process of creating copies of data to ensure its availability and integrity in case of system failures or data loss.

Internationalization: The process of designing software to support multiple languages and cultural preferences.
Modularity: A software design approach that divides a system into smaller, independent, and reusable modules or components.

Accessibility Standards: Guidelines and criteria, such as WCAG, that ensure digital content and interfaces are accessible to all users, including those with disabilities.

Quality Assurance: A set of systematic activities and processes that ensure the quality and reliability of software.

Appendix B: Field Layouts

An Excel sheet containing field layouts and properties/attributes and report requirements.

Sample sheet with information required to register the customer

Field	Length	Data Type	Description	Is Mandatory
Account Number	16	Numeric		Y
ISFC code	11	Alphanumeric		Y
Card Amount	20	Numeric		Y
Mandate Start Date	8	Date	Date of Mandate Registration	N
Mandate End Date	8	Date	Date of Mandate Expiry	N
Status	25	Alphanumeric	Status of Registration	Y
Customer Name	60	String		Y
Reject Reason Code	4	String	Reject Reason code in case mandate is rejected	N

Sample Report Requirements: Include the fields to be included in the report

Registration Report	Transaction Report
Bank Account Number	Transaction Reference Number
IFSC Code	Bank Account Number
Bank Name	IFSC Code
Account Status	Bank Name
Account Type	Customer Name
Customer Name	Card Number
Card Number	Debit Transaction Amount
SI Start Date	Transaction Date
Status	Status
Remarks	Debit Attempt Number
	Remarks

Appendix C: Requirement Traceability Matrix

Sl. No	Requirement ID	Brief Description of Requirement	Architecture Reference	Design Reference	Code File Reference	Test Case ID	System Test Case ID