**Waterfall Model Documents - AccuMap**

**Document – 1 – Business Case Document:**

Question 1) Why is this Project initiated?

Answer) The AccuMap Project is initiated to enhance the accuracy, integrity, and efficiency of business listing verification through advanced IT Methodologies. Current manual verification processes are time-consuming, prone to errors, and lack automation. This project leverages AI-powered data validation, fraud detection, and workflow automation to ensure accurate and reliable Business Data Management.

Question 2) What are the current problems?

Answer) Data Inaccuracy: Business listings often contain incorrect or incomplete details like (name, address, phone number, website, hours, geolocation).

Fraudulent Listings: Fake businesses, duplicate entries, and manipulated information compromise data quality.

Manual Effort & Time Consumption: High dependency on human reviewers results in inefficiencies and increased operational costs.

Lack of Real-Time Verification: No streamlined process to verify business details instantly.

Question 3) With this Project how many problems could be solved ?

Answer) With the implementation of AccuMap, the following problems will be addressed:

* AI-driven Data Validation: Ensures business listings contain accurate, verified details.
* Automated Fraud Detection: Identifies and removes fake or duplicate listings.
* Process Automation: Reduces manual effort by automating data verification.
* User Feedback Mechanisms: Enables real-time reporting and corrections.
* Scalable & Integrated System: Ensures seamless data processing and validation.

Question 4) What are the resources required?

Answer)

**Human Resources: 20**

Project Manager – Kumar

Sr. Business Analyst – Sirisha

Jr. BA - Shivani

AI/ML Engineers – Shridhar, Shiva, Winney

Software Developers – Juhi Varun, Preethi, Ramya, Shanthi, Shubham

Database Administrators – Deepak

QA Testers – Sai, Alekhya, Mounika

UI/UX Designers – Praveen, Sagar

IT Support & Maintenance Team – Naveen, Vamshi

**Technology & Infrastructure:**

AI/ML Algorithms for Data Validation

API Integrations for cross Verification

Data Security & Compliance Measures

**Budget Estimation:**

Software Development & AI Integration – 80 Lakhs

Infrastructure & Data Services – 50 Lakhs

Training & Change Management – 20 Lakhs

Security & Compliance – 10 Lakhs

Miscellaneous & Contingency – 10 Lakhs

Question 5) How much organizational change is required to adopt this technology?

Answer) **Process Adaptation (30%):** Employees must transition from manual verification to automated workflows.

**Training & Skill Development (20%):** Reviewers and administrators will undergo training on AI-based verification systems.

**Policy Updates (15%):** New guidelines will be established for business listing validation and approval.

**Stakeholder Engagement (10%):** Involvement of key stakeholders for seamless implementation and transition.

Question 6) Time frame to recover ROI?

Answer) **Short-Term (6-12 months):** Reduction in manual efforts, improved efficiency, and initial cost savings.

* **Mid-Term (12-18 months):** Enhanced fraud detection, data accuracy improvements, and operational cost reduction.
* **Long-Term (18-24 months):** Full automation of business listing verification, sustained ROI, and increased business trustworthiness

7) Stakeholders are identified through RACI Matrix.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Position** | **R** | **A** | **S** | **C** | **I** |
| Henry | Project Sponsor |  |  |  |  |  |
| Kumar | Project Manager |  |  |  |  |  |
| Kiran | Delivery Head |  |  |  |  |  |
| Sirisha | Sr.BA |  |  |  |  |  |
| Shivani | Jr. BA |  |  |  |  |  |
| Shridhar | AI/ML Engineers |  |  |  |  |  |
| Shiva | AI/ML Engineers |  |  |  |  |  |
| Winney | AI/ML Engineers |  |  |  |  |  |
| Juhi | Sr. Developer |  |  |  |  |  |
| Varun | Developer |  |  |  |  |  |
| Preethi | Developer |  |  |  |  |  |
| Ramya | Developer |  |  |  |  |  |
| Shanthi | Developer |  |  |  |  |  |
| Shubham | Developer |  |  |  |  |  |
| Deepak | Database Admin |  |  |  |  |  |
| Mike | Network Admin |  |  |  |  |  |
| Sai | Tester |  |  |  |  |  |
| Alekhya | Tester |  |  |  |  |  |
| Mounika | Tester |  |  |  |  |  |
| Praveen | UI/UX Designer |  |  |  |  |  |
| Sagar | UI/UX Designer |  |  |  |  |  |
| Naveen | IT Support |  |  |  |  |  |
| Vamshi | IT Support |  |  |  |  |  |

**Document 2 - BA Approach Strategy.**

* What are the steps needed to complete a Project ?

1. The steps needed to complete a Project are: Gather requirements through Elicitation Techniques.
2. Document the requirement according to the standards.
3. Model the requirements using UML.
4. Communicate the requirements to the Technical Team. (KT)
5. The tech team takes up to the next stages like design, develop and test.
6. During these stages I will be tracking the requirements through RTM (Requirement Tracability Matrix)
7. Handle Change requests during the development.
8. After the App development is completed we facilitate UAT.

* What Elicitation Techniques do we apply?

1. We have many Elicitation techniques like Brainstorming, Document Analysis, Reverse Engineering, Focus Groups & Observation etc.

* How to do Stakeholder Analysis?

1. Stakeholder Analysis can be done by using RACI Matrix which involves in identifying the Stakeholders and defining their roles & responsibilities within a Project.

* What Documents to write?

1. BRD – Business Requirement Document - Describes the goal of the Project.
2. FRD – Functional Requirements Document – Approach to achieve the Goal.
3. Use Case Document
4. Test Case Document.

* What process to follow to Sign off on the Documents?

1. Signoff can be taken by using email confirmation from the Client. It can be taken on SRS as this is the Primary & important Document.

* How to take Approvals from the Client?

1. By Establishing a formal meeting with the Clients to keep them informed and get continuous feedback.

* What communication channels to establish and implement?

1. Regular meetings, Weekly Status meetings, bi-weekly Sprint reviews & mostly Stakeholder updates.

* How to handle change requests?
* A) Firstly we need to understand if it’s a defect from the previous installations if yes the raise it as a bug so the support team will handle it.
* We need to do Impact analysis, Feasibility Study & Effort estimation.
* Then take the Project Manager approval and then log it into the Change tracker.
* How to update the Progress of the Project to the Stakeholders?

1. Through Weekly status reports & Monthly review meetings.

* How to take Signoff on the UAT?

1. UAT Preparation, Conduct UAT, Fix issues, Acceptance form, Final review meeting, obtain Signoff.

**Document 3 - Functional Specifications**

|  |  |
| --- | --- |
| Project Name | AccuMap |
| Customer Name | Infosys |
| Project Version | 1.0 |
| Project Sponsor | Mr. Henry |
| Project Manager | Mr. Kumar |
| Project Initiation Date | 05- 03-2022 |

**Functional Requirement Specifications**

|  |  |  |  |
| --- | --- | --- | --- |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| FR0001 | Login | User should be able to log in to the application. | 10 |
| FR0002 | User Registration | New Users should be able to create an Account | 9 |
| FR0003 | Business Listing review | Users should be able to review and validate business listings | 10 |
| FR0004 | Data Verification | System should verify business data using AI-powered validation | 10 |
| FR0005 | Role-based Access | Different User roles should have specific access permissions | 8 |
| FR0006 | User Feedback | Users can submit feedback for Business listings | 7 |

**Document 4 - Requirement Traceability Matrix**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Req ID** | **Req Name** | **Req. Description** | **Design** | **D1** | **T1** | **D2** | **T2** | **UAT** |
| FR0001 | Login | User should be able to log in to the application. | Yes | Pending | No | Yes | Yes | Yes |
| FR0002 | User Registration | New Users should be able to create an Account | Yes | Pending | No | Yes | Yes | Yes |
| FR0003 | Business Listing review | Users should be able to review and validate business listings | Yes | Pending | No | Yes | Yes | Yes |
| FR0004 | Data Verification | System should verify business data using AI-powered validation | Yes | Pending | No | Yes | Yes | Yes |
| FR0005 | Role-based Access | Different User roles should have specific access permissions | Yes | Pending | No | Yes | Yes | Yes |
| FR0006 | User Feedback | Users can submit feedback for Business listings | Yes | Pending | No | Yes | Yes | Yes |

**Document 5 - BRD Template**

1. **Document Revisions:**

|  |  |  |
| --- | --- | --- |
| **Date** | **Version No.** | **Document Changes** |
| 05/02/2023 | 0.1 | Initial Draft |
| 10/02/2023 | 0.2 | Updated based on initial review feedback |
| 15/02/2023 | 0.3 | Added Functional Requirements |
| 20/02/2023 | 0.4 | Finalized & Approved |

1. **Approvals**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Signature** | **Date** |
| Project Sponsor | Henry | Sponsor |  | 01/02/2023 |
| Business Owner | Kiran | Business Owner |  | 05/02/2023 |
| Project Manager | Kumar | Project Manager |  | 10/02/2023 |
| System Architect | Kevin | System Architect |  | 15/02/2023 |
| Development Lead | Juhi | Development Lead |  | 20/02/2023 |
| User Experience Lead | Praveen | User Experience Lead |  | 25/02/2023 |
| Quality Lead | Sai | Quality Lead |  | 27/02/2023 |
| Content Lead | Swathi | Content Lead |  | 05/03/2025 |

1. **Introduction**

**4.1. Business Goals:**

The primary goal of this project is to develop a systematic IT solution that enhances data accuracy, validation, and verification for business information management. The solution aims to streamline data processing, ensure high-quality standards, and reduce human intervention in manual verification tasks.

* Need: Improve the accuracy and reliability of business data.
* Reduce inconsistencies caused by user-generated content.
* Optimize verification workflows through automation.
* Enhance system efficiency and minimize redundant efforts.

**4.2 Business Objectives**

To provide a robust IT solution for:

* **Automated Data Validation System** for verifying business information.
* **Centralized Data Management Platform** for structured and secure data handling.
* **AI-Powered Quality Assurance System** to ensure business listings are accurate.
* **Intelligent Review Mechanism** with user feedback integration.
* **Scalable Cloud Infrastructure** for high availability and performance.

### **4.3 Business Rules**

* Business data must comply with validation criteria before approval.
* Only verified and authentic sources can be used for validation.
* All modifications must be logged for audit and compliance purposes.
* System must follow predefined escalation and approval workflows.

### **4.4 Background**

Historically, business listings were managed with minimal verification, leading to incorrect or incomplete data. The challenge was to manually review and approve thousands of records, which was time-consuming and prone to errors. This project aims to automate and streamline the review and approval process, ensuring higher accuracy and efficiency. By leveraging AI-based validation techniques and structured workflows, we can significantly enhance data reliability and reduce workload.

### **4.5 Project Objective**

The objective of this project is to develop an intelligent, automated validation system that aligns with organizational goals. The system will:

* Automate the verification of business information.
* Improve data accuracy through AI-powered validation.
* Reduce manual review time by integrating smart approval workflows.
* Enable seamless interaction with other systems for data consistency.

### **4.6 Project Scope**

#### 4.6.1 In-Scope Functionality

* AI-powered data validation for business listings.
* Automated verification workflows with quality assurance checks.
* Role-based access and permissions for different user levels.
* Integration with official databases and external sources for verification.
* User feedback mechanism for business listing improvements.
* Audit logs for tracking changes and maintaining compliance.

#### 4.6.2 Out-of-Scope Functionality

* End-user mobile application development.
* Manual data entry or review beyond automated workflows.
* Integration with third-party advertising platforms.
* Real-time geospatial tracking or navigation features.

**5. Assumptions**

The following assumptions are considered for the project:

* All stakeholders will provide timely approvals and feedback.
* Business rules and validation criteria will remain consistent throughout development.
* The required data sources for verification will be accessible and reliable.
* The IT infrastructure will support scalability and high availability.
* AI/ML models will be trained with sufficient and accurate historical data.
* Project team members will be available as per the planned schedule.

**6. Constraints**

The project will operate within the following constraints:

* Budget Constraint: The project budget is limited to 2 Crores INR.
* Time Constraint: The project must be completed within 18 months.
* Regulatory Compliance: The system must adhere to data privacy and security regulations.
* Technology Constraint: The solution must integrate with existing IT infrastructure and tools.
* Resource Availability: Team members must balance multiple project commitments.

**7. Risks**

A risk is something that could affect the success or failure of a project.

1. Technological Risks

**Risk:** Compatibility issues with existing IT infrastructure.

**Likelihood:** Medium

**Impact:** High (Delays, additional costs for infrastructure upgrades)

**Mitigation:** Conduct thorough system integration testing and implement phased rollouts.

**Risk:** AI-powered validation may produce false positives/negatives.

**Likelihood:** High

**Impact:** Medium (Increased manual verification workload)

**Mitigation:** Implement a feedback mechanism for continuous AI improvement.

2. Skills Risks

**Risk:** Shortage of skilled AI/ML engineers and data validation experts.

**Likelihood:** Medium

**Impact:** High (Delays, increased training costs)

**Mitigation:** Upskill existing employees and partner with external consultants.

**Risk:** Reviewers may not fully adapt to the new system.

**Likelihood:** Medium

**Impact:** Medium (Resistance to change, lower adoption rates)

**Mitigation:** Provide extensive training and user-friendly interfaces.

3. Political Risks

**Risk:** Changes in regulatory policies regarding data validation and online business listings.

**Likelihood:** Medium

**Impact:** High (Need for compliance adjustments, potential legal issues)

**Mitigation:** Regularly monitor and adapt to compliance requirements.

4. Business Risks

**Risk:** Project failure due to lack of stakeholder support.

**Likelihood:** Medium

**Impact:** High (Project cancellation or resource reallocation)

**Mitigation:** Conduct regular stakeholder meetings and ensure alignment with business goals.

**Risk:** Insufficient ROI within the estimated time frame.

**Likelihood:** Medium

**Impact:** Medium (Extended break-even period)

**Mitigation:** Implement phased deployment to track early performance and adjust accordingly.

5. Requirements Risks

**Risk:** Incomplete or ambiguous requirement gathering.

**Likelihood:** High

**Impact:** High (Rework, delays, and misaligned expectations)

**Mitigation:** Use structured requirement elicitation techniques and validation workshops.

**Risk:** Changing business needs after project initiation.

**Likelihood:** High

**Impact:** High (Frequent change requests, budget overruns)

**Mitigation:** Establish a clear change management process with impact analysis.

6. Other Risks

**Risk:** Security threats like data breaches or cyberattacks.

**Likelihood:** High

**Impact:** High (Data loss, reputational damage, regulatory penalties)

**Mitigation:** Implement strong encryption, access controls, and periodic security audits.

**Risk:** Vendor dependency for cloud storage and AI services.

**Likelihood:** Medium

**Impact:** Medium (Operational disruptions if vendor support fails)

**Mitigation:** Develop contingency plans and explore multiple vendor options.

**8. Business Process Overview**

This section describes the overall process flow of the project, highlighting the transition from the existing system (AS-IS) to the recommended solution (TO-BE).

#### 8.1 Legacy System (AS-IS)

The legacy system relied on fragmented data storage, manual business listings, and disparate tools for managing enterprise data. Key limitations included:

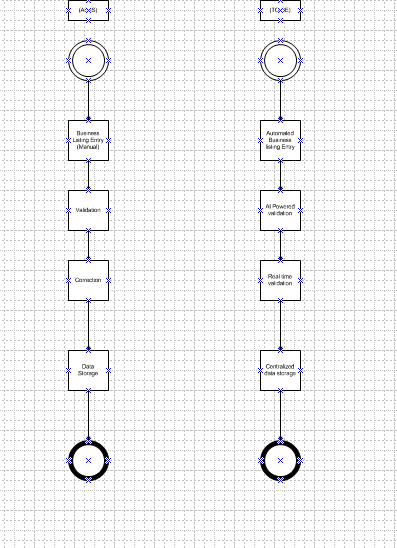
* **Manual Business Listing Management:** Google’s previous system required extensive human validation for business profile accuracy, leading to inconsistencies.
* **Data Duplication & Integrity Issues:** Business listings were often merged incorrectly, causing inaccurate search results.
* **Limited Automation & AI Integration:** Lack of AI-driven validation resulted in inefficient updates and verification processes.
* **Scalability Challenges:** Handling large-scale data updates across various Google services was inefficient.

#### 8.2 Proposed Recommendations (TO-BE)

The new solution integrates Google’s cloud-based automation and AI capabilities to enhance data accuracy, reduce duplication, and streamline business listing validation. Key improvements include:

* **Google Cloud Storage & BigQuery:** Centralized, scalable data management to eliminate redundancy.
* **AI-Powered Validation (Google AI/ML Models):** Automated detection of duplicate or incorrect business listings.
* **Google Business Profile (GBP) API Enhancements:** Seamless updates and verification for business owners.
* **Integration with Google Kubernetes Engine (GKE):** Ensures high availability and efficient scaling.
* **Improved Data Governance & Security:** Leveraging Google’s IAM (Identity & Access Management) for better access control.

**Process Flow Diagram:**

****

**9. Business Requirements**

The business requirements for this project are categorized based on priority and functionality. These requirements are essential for aligning the project with business objectives and ensuring seamless implementation.

**9.1 Functional Requirements:**

These define what the system should do and the features it must support.

The approach through which functionality is achieved is known as Functional Requirement. It helps understand what the system should do to achieve the functionality.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Req. ID** | **Req. Name** | **Description** | **Priority** | **Reference (Use case/FRD)** | **Links** |
| |  | | --- | | BR001 |  |  | | --- | |  | | User Authentication | Users must be able to log in using Google authentication | High | UC001 | Use Case - Login |
| BR002 | Role-Based Access | Different user roles with defined permissions | High | UC002 | Use Case - Role Management |
| BR003 | Data Synchronization | Ensure real time sync between cloud storage and the platform | High | UC003 | Use Case - Data Sync |
| BR004 | Performace Monitoring | Integrate Google Cloud Monitoring for performance insights. | Medium | UC004 | Use Case - Monitoring |
| BR005 | Security Compliance | Adhere to Company’s security policies and standards. | High | UC005 | Security Guidelines |

**Non-Functional Requirements:** They will describe the qualities and attributes of a system focusing on how the system performs. Integration of external Peripherals with the system along with quality requirements are called as Non-Functional Requirements.

These define system performance, security, and usability criteria.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Req. ID** | **Req. Name** | **Description** | **Priority** | **Links** |
| NFR001 | Scalability | |  | | --- | | The system should handle at least 10M concurrent users. |  |  | | --- | |  | | High | Scalability Docs |
| NFR002 | Reliability | |  | | --- | | 99.99% uptime required using Google Cloud Load Balancing. |  |  | | --- | |  | | High | Cloud Architecture |
| NFR003 | Compliance | |  | | --- | | Adhere to GDPR, SOC 2, and Google security policies. |  |  | | --- | |  | | High | Security Compliance |
| NFR004 | Latency | |  | | --- | | System response time should be < 1 sec for API calls. |  |  | | --- | |  | | Medium | Performance Benchmark |
| NFR005 | Data Backup | |  | | --- | | Daily backups to Google Cloud Storage with retention policies. |  |  | | --- | |  | | High | Backup Strategy |

**10. Appendices**

**10.1. List of Acronyms**

RFP – Request for Proposal

RFI - Request for Information

RFQ – Request for Quotation

Business Case

SOW – Statement of Work

Stakeholders Document

KOM – Kick off Meeting Report

Software Development Plan (Tasks & Resources)

Project Plan (using MPP)

Quality Plan

BRD – Business Requirement Document

URD – User Requirements Document

FRS – Functional Requirement Specification

SSD – Supplementary Specification Document

SRS – Software Requirement Specification

RTM – Requirement Traceability Matrix

FRD – Functional Requirement Document

Solution Document

HDD – High Level Design Document

ADD – Application Design Document

LDD – Low Level Design Document

CDD – Component Design Document

Use Case Description Document – Use Case Specs

CT – Change Tracker

Change Request Log

Status Reporting

Checklists

Test Strategy

Test Plan

Test Case Document – Test Scripts

Client Acceptance Form

Project Closure Document

Fit for Support Document User Manuals

**10.2. Glossary of Terms**

Acceptance criteria: Criteria associated with requirements, products, or the delivery cycle that must be met in order to achieve stakeholder acceptance.

Actor (business analysis): A human, device, or system that plays some specified role in interacting with a solution.

Architecture: The design, structure, and behaviour of the current and future states of a structure in terms of its components, and the interaction between those components. See also business architecture, enterprise architecture, and requirements architecture.

Artifact (business analysis): Any solution-relevant object that is created as part of business analysis efforts.

Assumption: An influencing factor that is believed to be true but has not been confirmed to be accurate, or that could be true now but may not be in the future.

Business goal: A state or condition that an organization is seeking to establish and maintain, usually expressed qualitatively rather than quantitatively.

Business need: A problem or opportunity of strategic or tactical importance to be addressed.

Business process re-engineering: Rethinking and redesigning business processes to generate improvements in performance measures.

Business requirement: A representation of goals, objectives and outcomes that describe why a change has been initiated and how success will be assessed.

Business rule: A specific, practicable, testable directive that is under the control of the business and that serves as a criterion for guiding behaviour, shaping judgments, or making decisions.

Change: The act of transformation in response to a need.

Change agent: One who is a catalyst for change.

Change control: Controlling changes to requirements and designs so that the impact of requested changes is understood and agreed-to before the changes are made.

Collaboration: The act of two or more people working together towards a common goal.

Constraint (business analysis): An influencing factor that cannot be changed, and that places a limit or restriction on a possible solution or solution option.

Deliverable: Any unique and verifiable work product or service that a party has agreed to deliver.

Design: A usable representation of a solution.

Document analysis (business analysis): An examination of the documentation of an existing system in order to elicit requirements.

Domain: The sphere of knowledge that defines a set of common requirements, terminology, and functionality for any program or initiative solving a problem.

End user: A stakeholder who directly interacts with the solution.

Enterprise: A system of one or more organizations and the solutions they use to pursue a shared set of common goals.

Iteration (business analysis): A single instance of progressive cycles of analysis, development, testing, or execution.

Knowledge area (business analysis): An area of expertise that includes several specific business analysis tasks.

**10.3. Related Documents**

|  |  |  |
| --- | --- | --- |
| **Business Requirements Document (BRD)** | * + Defines the business needs and objectives. |  |

|  |  |
| --- | --- |
| **Functional Requirements Document (FRD)** | * + Details the functional aspects of the project. |

|  |  |  |
| --- | --- | --- |
| **Use Case Document** | * + - Describes system interactions and expected behaviors. |  |

|  |  |
| --- | --- |
| **Test Case Document** | * + Outlines test scenarios for validation. |

|  |  |  |
| --- | --- | --- |
| **Security Compliance Guide** | * + Defines security measures for the project. |  |