📄 Functional Requirements Document (FRD)

Project Name: Bank Churn & Loan Repayment Prediction
Document Type: Functional Requirements Document (FRD)
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Date: April 6, 2025

📜 1. Objective

The purpose of this document is to define the **functional requirements** for the Bank Churn and Loan Repayment Prediction project. It outlines how the system will behave and the data logic to be implemented to meet the project goals.

🧩 2. Functional Scope

This project combines bank customer data and loan application data to:

- Predict **customer churn**
- Predict **loan approval likelihood**
- Enable actionable insights through data modelling, visualization, and ML algorithms

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🔧 3. System Functional Requirements

Req. ID	Functionality	Description
FR-001	Data Ingestion	Load and clean both datasets (Customer + Loan Application)
FR-002	Data Merging	Join both datasets using customer_id as the key
FR-003	Data Validation	Handle missing/null values, outliers, data type mismatches
FR-004	Feature Engineering	Derive new fields (e.g., income ratio, loan-to-income ratio, churn risk score)
FR-005	ERD Modeling	Build logical data model for analytics (done in ERD phase)
FR-006	Churn Prediction	Use ML classification algorithm to predict churn label (1/0)
FR-007	Loan Approval Prediction	Use ML classification model to predict loan_status (Y/N)
FR-008	Dashboarding (Power BI)	Create visual dashboards for churn and loan KPIs

FR-009	Filtering & Drilldown	Enable filters by country, age, tenure, credit score, property area
FR-010	Reporting	Export performance reports, churn trends, and loan approval analysis

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📌 4. Assumptions

- Unique customer identifiers (customer_id) are consistent across both datasets.
- The test dataset (loan) will not be used for prediction, only for structure reference.
- Business stakeholders are primarily interested in **early churn signals** and **loan approval behaviour**.

🧪 5. Non-Functional Requirements (Optional but Good)

NFR-ID	Requirement	Description
NFR-001	Performance	Dashboard should load under 5 seconds
NFR-002	Usability	Visuals must be intuitive for non-technical users
NFR-003	Accuracy	ML models must achieve ≥ 75% prediction accuracy

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✅ 6. Success Criteria

- Model accuracy ≥ 75% for both churn and loan predictions
- Dashboard adopted by stakeholders
- Business decisions supported by KPIs from the visual reports

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