Comprehensive Project Outline for Software Engineering Development at Atom Bank

Team Alpha

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1 Project Overview

The purpose of this project is to create a new Account Onboarding and Identity Verification System for Atom Bank. Atom Bank aims to make its onboarding process more secure, efficient, and user-friendly to meet the demands of modern digital banking customers. As a fully digital bank, Atom Bank's focus is on providing a seamless experience that balances regulatory compliance with high standards of data security and user satisfaction.

This project will allow customers to create and verify their accounts in a streamlined, secure manner, leveraging third-party verification systems for government ID checks and biometric authentication. Additionally, the system is designed to ensure regulatory compliance, particularly with Know Your Customer (KYC) and Anti-Money Laundering (AML) requirements, which are essential in the banking sector for preventing fraud and ensuring the safety of customer data.

The project is expected to improve customer onboarding experience, reduce processing times, and enhance operational efficiency by reducing manual intervention. By providing a fully digital experience, Atom Bank aims to reduce the average onboarding time from 20 minutes to less than 10 minutes, contributing to both user satisfaction and a reduction in operational costs.

2 Scope and Objectives

This project is scoped to develop a user interface, a secure backend, and integrate third-party services that handle identity verification and compliance checks. The primary objective is to create an account creation and verification system that operates end-to-end without requiring physical paperwork or in-person verification, making it accessible to customers at any time and place.

The scope covers all necessary development activities, including frontend and backend development, database setup, and compliance with security and accessibility standards. Specifically, the user interface will be developed with a mobile-first design approach, ensuring that it is accessible on smartphones, tablets, and desktops. The backend will be designed to securely manage customer data, using encryption and multi-factor authentication to ensure account security.

However, the project does not include integration with non-onboarding features or enhancements to Atom Bank's existing account management system. These aspects are considered out of scope and may be addressed in future projects if required. The focus of this project is exclusively on onboarding and the initial setup process.

The objectives are clear: 1. Achieve regulatory compliance while minimizing friction for customers. 2. Develop a secure, easy-to-use, and accessible onboarding interface. 3. Implement automated identity verification and compliance checks. 4. Establish a scalable backend to support future growth in customer onboarding volume.

3 Requirements Gathering

3.1 Functional Requirements

To ensure that the system meets both Atom Bank's operational needs and the customer's expectations, we have identified several key functional requirements. First, the system must allow customers to register using their mobile number or email address. This flexibility caters to customer preference, providing both traditional and digital options for account creation. A customer can initiate the account creation process with just a few personal details, streamlining the setup and reducing friction in the onboarding journey.

The system must also include identity verification through government-issued ID and biometric facial recognition. This process will utilize third-party verification services to securely capture and verify identity documents, such as a passport or driver's license. The customer will be prompted to take a real-time selfie that will be compared against the ID photo using advanced facial recognition technology. This biometric verification adds an extra layer of security and ensures that Atom Bank's compliance requirements are met.

Multi-factor authentication (MFA) is also a fundamental part of the functional requirements. The system will support various MFA methods, including SMS-based verification and authenticator app codes. By offering MFA, Atom Bank enhances account security, making it difficult for unauthorized individuals to gain access to user accounts. In addition, the system will be required to store all identity documents securely, ensuring compliance with GDPR and other data protection regulations, so that customer data is handled with the utmost care and security.

Finally, the system must integrate with Atom Bank's CRM system to keep customer data synchronized in real-time. This integration ensures that customer profiles are always up-to-date and accessible to bank representatives for any future interactions, including customer service requests. The CRM synchronization must be seamless and operate without introducing significant latency or requiring manual intervention.

3.2 Non-functional Requirements

In addition to functional needs, this project has several non-functional requirements. Scalability is a critical aspect, as the system must handle a projected load of up to 100,000 onboarding requests per month without experiencing performance degradation. To achieve this, the architecture will be designed with a microservices approach, enabling each component to scale independently based on demand.

Another essential non-functional requirement is system performance. The end-to-end onboarding process must complete within an average of 8 minutes under standard conditions. To achieve this, latency and processing times for each component—such as identity verification and MFA—will be optimized. Additionally, Atom Bank mandates that all sensitive data be encrypted both in transit and at rest, with AES-256 encryption as the chosen standard.

System availability is another priority, with a required uptime of 99.9%. This availability level will be maintained through redundant infrastructure, ensuring that customers can access the onboarding system at any time. Finally, accessibility standards must be met to ensure that the system is usable by individuals with disabilities. Compliance with WCAG

2.1 guidelines will be achieved by providing screen reader support, high contrast options, and keyboard navigability.

4 User Journey and User Stories

4.1 User Journey

The user journey for the Account Onboarding and Identity Verification System is divided into several key stages, each designed to be as efficient and intuitive as possible. In the first stage, the customer initiates the onboarding process by choosing to create a new account. The system will prompt the customer to enter basic personal information, such as name, date of birth, and contact details, in a clean and easy-to-follow form.

Once the customer's basic information is submitted, they move to the identity verification stage. Here, the system guides the customer through a process to capture their government-issued ID and a real-time selfie. The interface provides clear instructions to help the customer capture high-quality images, reducing the likelihood of errors or the need for retakes. The system then processes these images and verifies the identity using facial recognition.

Following identity verification, the customer is prompted to set up MFA to add another layer of security to their account. The system will offer the customer a choice between SMS-based MFA or using an authenticator app, allowing flexibility in how customers secure their accounts.

In the final stage, the customer is notified that their account has been created successfully. They are then granted access to their account dashboard, where they can view account details, complete additional profile settings, and begin using Atom Bank's services.

4.2 User Stories

Each user story represents a distinct feature or functionality that the onboarding system must fulfill. For example, one key user story is: "As a customer, I want to be able to register with either my mobile number or email address to have flexibility in account creation." This story underscores the need for a flexible registration process that caters to user preferences. Another story, "As a customer, I want to verify my identity using my government ID and a real-time selfie, so my account is secure and compliant," reflects the regulatory demands Atom Bank faces.

Additional user stories include: "As a customer, I want to set up MFA to enhance my account security," and "As a system administrator, I want to receive alerts in case of multiple failed onboarding attempts, to monitor potential security threats." These stories highlight both user-facing and administrative functionalities necessary for a robust and secure onboarding experience.

5 Technical Architecture

The architecture of the Account Onboarding System is divided into three main components: the frontend, backend, and integration with third-party services. The frontend is a responsive

web interface developed with React.js, designed to be mobile-first. This approach ensures that the interface is intuitive and accessible on a variety of devices, from smartphones to desktops, enhancing user convenience and accessibility.

The backend is built on a Node.js framework, which is chosen for its scalability and efficiency in handling asynchronous operations. The backend communicates with the frontend through RESTful APIs and manages user sessions, security protocols, and data storage. A microservices architecture allows each service—such as identity verification, MFA, and compliance checks—to operate independently. This modular design enables individual components to scale based on demand without affecting overall system performance.

Data storage is handled by an SQL database deployed on a secure cloud environment, with strict encryption standards to protect sensitive user information. This database is structured to support rapid querying and synchronization with Atom Bank's CRM system, ensuring that customer profiles are up-to-date and accessible.

Third-party integrations include Jumio for identity verification, Twilio for SMS notifications, and SendGrid for email confirmations. Each integration is managed through a dedicated API gateway, which handles data flow and monitors response times. In case of service unavailability, the API gateway has fallback mechanisms to maintain system functionality without compromising the customer experience.

6   Development Timeline

The project development will be carried out in five distinct phases, starting with planning and concluding with deployment. The planning phase will take approximately two weeks and includes activities such as requirements gathering, stakeholder alignment, and defining success metrics. During this phase, the project team will work closely with Atom Bank's compliance and security teams to ensure that all regulatory requirements are fully understood and addressed.

The design phase, which will last three weeks, focuses on creating detailed wireframes, architectural diagrams, and data flow models. This phase also involves database schema setup and finalizing contracts with third-party services. By the end of the design phase, the project team will have a comprehensive blueprint for the entire system, ensuring that development proceeds efficiently.

The development phase is divided into two stages. The first stage, lasting four weeks, involves building the frontend interface, developing the account creation functionality, and initial API integration. The second stage, which takes three weeks, focuses on integrating identity verification, MFA, and compliance checks. Comprehensive testing will follow, ensuring that each feature functions as expected under various conditions.

The deployment phase involves a one-week rollout to the production environment, with continuous monitoring and a final security audit to ensure that the system is ready for customer use.

7 Testing and Quality Assurance

Testing will include unit testing for individual components, integration testing to ensure seamless operation across modules, and user acceptance testing (UAT) with a small group of customers. Security and load testing will simulate high-traffic conditions to confirm that the system meets Atom Bank's performance requirements. UAT will focus on gathering feedback to refine the interface and user flows before full deployment.

8 Conclusion

The Account Onboarding System project at Atom Bank represents a significant step toward fully digital, secure, and compliant banking. By implementing a streamlined, secure, and scalable system, Atom Bank will enhance its customer experience, strengthen security, and meet regulatory standards, ensuring a strong foundation for future growth in a digital-first banking landscape.