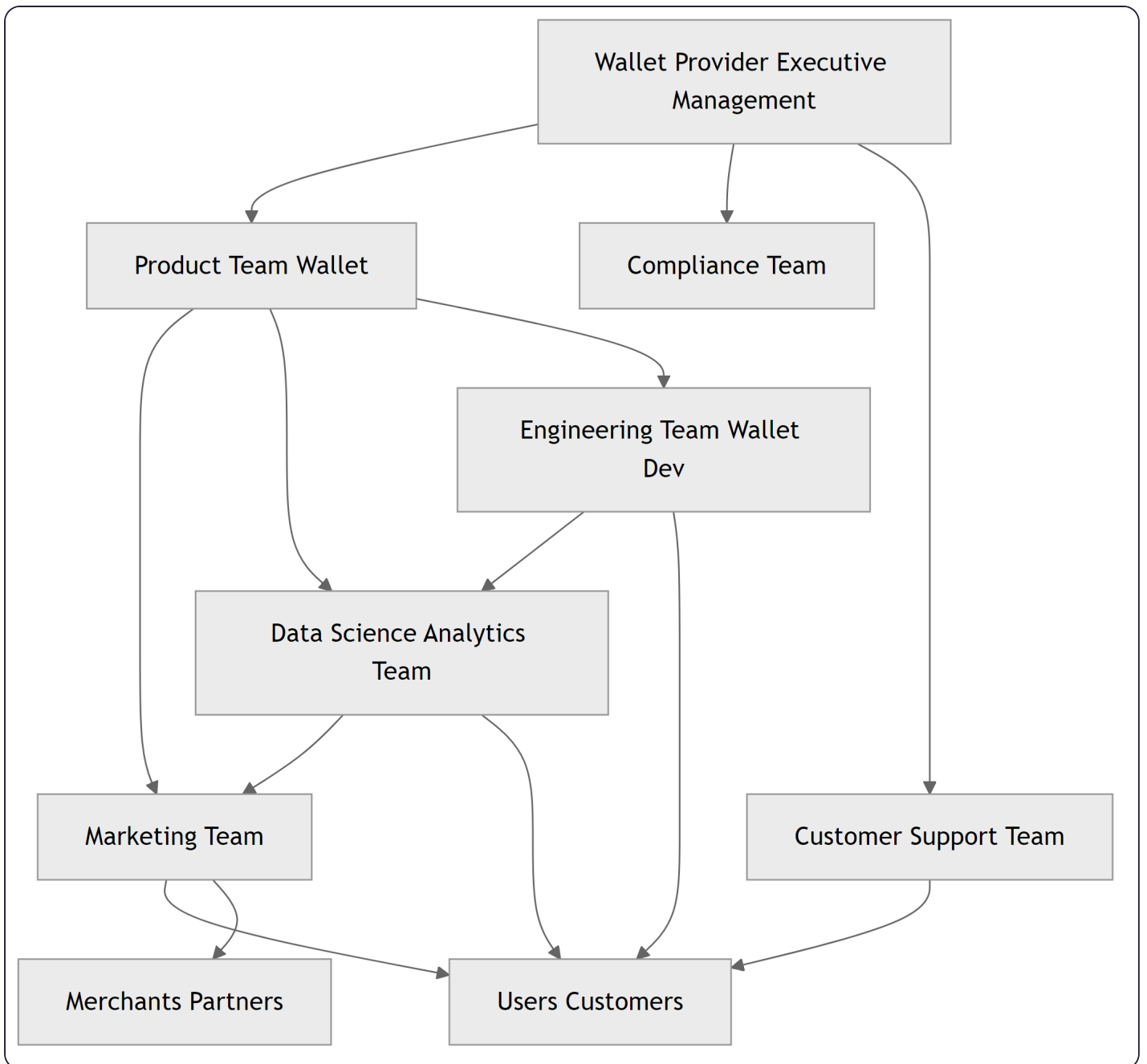


01. Executive Summary

This report outlines the business analysis for implementing a data-driven personalization solution within a digital wallet application. The primary objective is to increase the transaction frequency and overall active user base, addressing the current challenge where only 25% of registered users actively perform transactions. By leveraging user data such as spending patterns, app engagement, demographics, and merchant preferences, the solution aims to deliver highly relevant offers, nudges, and rewards, thereby enhancing user engagement and transaction adoption. This document details the stakeholder landscape, proposed process flows, comprehensive requirements, use cases, data strategy, functional scope, and key performance indicators for success.

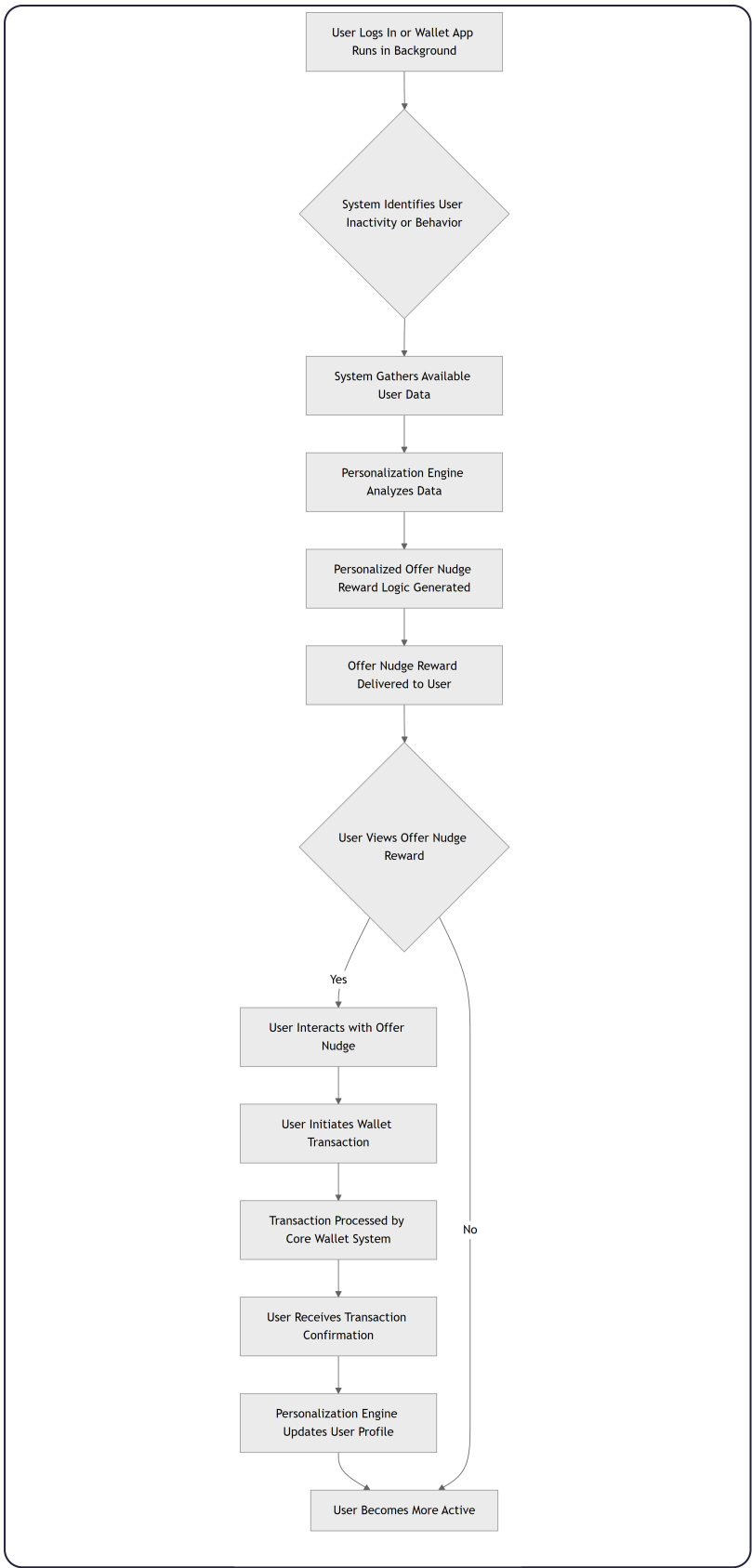
02. Stakeholder Map

This map identifies the key individuals and groups involved in or affected by the implementation of the data-driven personalization solution.



03. Process Flow: User Transaction Activation Journey

This process flow illustrates the typical journey of an inactive user becoming an active transactor through the proposed personalization initiatives.



04. Business Requirement Document (BRD)

4.1. Project Goal

Increase the percentage of active transacting users from 25% to X% within Y months, and boost the overall transaction frequency within the digital wallet platform.

4.2. Business Objectives

1. Increase Transaction Frequency:

Drive more P2P transfers, bill payments, and merchant payments among existing users.

1. Enhance User Engagement:

Improve user interaction with the wallet application beyond balance checks, encouraging feature exploration and usage.

1. Optimize Marketing Spend:

Leverage data to deliver highly relevant and effective engagement campaigns, reducing wastage on generic offers.

1. Improve User Retention:

Foster loyalty and reduce churn by providing a more personalized and rewarding experience.

1. Monetization Opportunities:

Identify potential for increased revenue through higher transaction volumes and merchant partnerships .

4.3. Business Needs

- **Data-Driven Personalization Capability:**

A system to analyze diverse user data to generate tailored recommendations.

- **Targeted Engagement Mechanisms:**

Ability to deliver personalized offers, nudges, and rewards through various in-app and push channels.

- **Gamification Integration:**

Features to encourage consistent transaction behavior through fun and rewarding elements.

- **Performance Monitoring:**

Tools to track the effectiveness of personalization strategies and user behavior changes .

4.4. Scope Overview

- **In Scope:**

Personalized recommendations, offer delivery mechanisms (in-app, push notifications), analytics dashboard for tracking personalization effectiveness.

- **Out of Scope:**

Core transaction processing engine, backend settlement processes, changes to existing payment methods .

05. Functional Requirement Specification (FRS)

5.1. Functional Requirements

1. **FR001: Personalized Cashback and Rewards Generation: **

◦ **Description:**

The system shall analyze user spending history (merchant categories, transaction frequency, average ticket size) to generate personalized cashback offers or reward points for future transactions. *** Examples:**

"Get 5% cashback on your next grocery payment over \$50", "Earn 100 bonus points when you pay a utility bill this month." 2. **FR002: Triggered Notifications for Inactive Users: **

** **Description:***

The system shall identify users who have not performed a transaction within a defined period (e.g., 7 days, 15 days) and send targeted push notifications with compelling offers or reminders based on their past behavior or inferred needs. *** Examples:**

"We miss you! Get \$2 off your next P2P transfer", "Your favorite coffee shop has a new deal – pay with wallet to get 10% off!" 3. **FR003: Gamification Elements for Consistent Transactions: **

** **Description:***

The system shall implement gamification features such as badges, streak rewards, or tiered loyalty levels to encourage consistent transaction behavior and usage. *** Examples:**

"Transaction Master" badge for 10 consecutive payments, "Week 1 Streak Reward: \$1 bonus for paying 7 bills in 7 days." 4. **FR004: Merchant-Specific Deal Push: **

** **Description:***

The system shall identify user preferences for specific merchants or merchant categories (based on past transactions or browsing history) and push relevant, tailored deals from those merchants directly to the user. *** Examples:**

"Special 15% discount at your favorite restaurant, 'The Diner'", "Exclusive offer: Get \$5 off your next ride with 'CityCabs' when you pay with wallet."

5.2. Non-Functional Requirements (NFRs)

1. **NFR001: Data Privacy & Security: **

◦ **Description:**

The solution must comply with all relevant data privacy regulations (e.g., GDPR, CCPA) and banking secrecy acts. All PII and sensitive financial data used for personalization must be handled according to KYC/AML guidelines and secure data governance policies. *** Metric:**

100% compliance with audit reports; zero data breaches related to personalization data. 2. **NFR002: Scalability: **

** **Description:***

The personalization engine and offer delivery system must be highly scalable to handle the existing large user base (millions) and anticipated growth, processing millions of user interactions and generating recommendations concurrently. * **Metric:**

Support up to 10 million active users concurrently without performance degradation; ability to scale horizontally. 3. *NFR003: Real-time Offer Recommendation: *

* **Description:**

Personalized offers and nudges presented on the wallet home screen or as post-transaction upsells must be generated and displayed with minimal delay. * **Metric:**

Offer recommendation latency < 1 second for 95% of requests. 4. *NFR004: Availability: *

* **Description:**

The personalization service should be continuously available to ensure users always receive relevant content. * **Metric:**

99.9% uptime for the personalization engine. 5. *NFR005: Performance (Push Notifications): *

* **Description:**

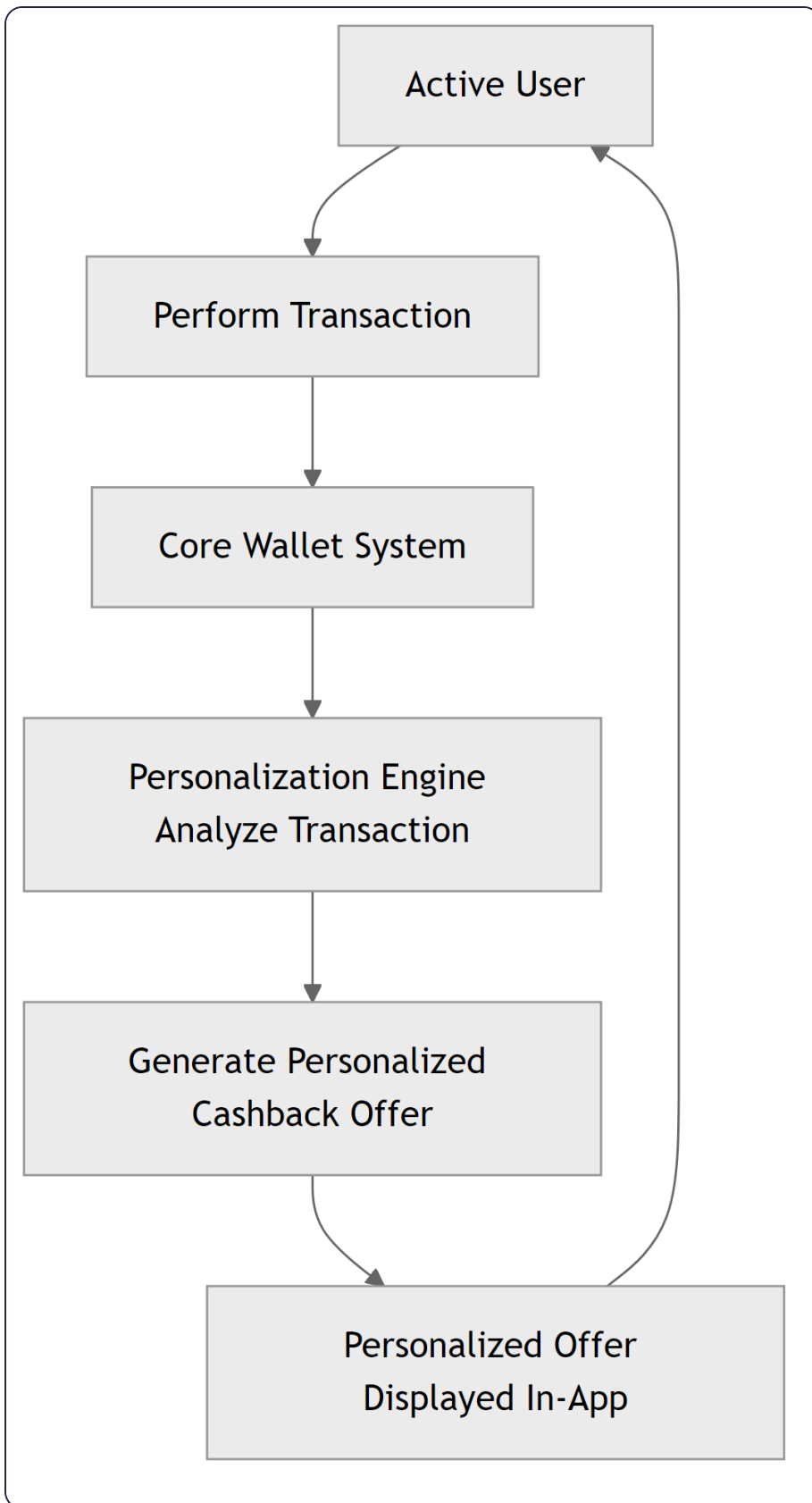
Push notifications for triggered events must be delivered promptly. * **Metric:**

98% of push notifications delivered within 5 seconds of trigger.

06. Use Case Diagrams and Detailed Scenarios

6.1. Use Case 1: Receive Personalized Cashback Offer

Diagram:



Detailed Scenario:

- **Use Case Name:**

Receive Personalized Cashback Offer

- **Actors:**

Active User, Core Wallet System, Personalization Engine

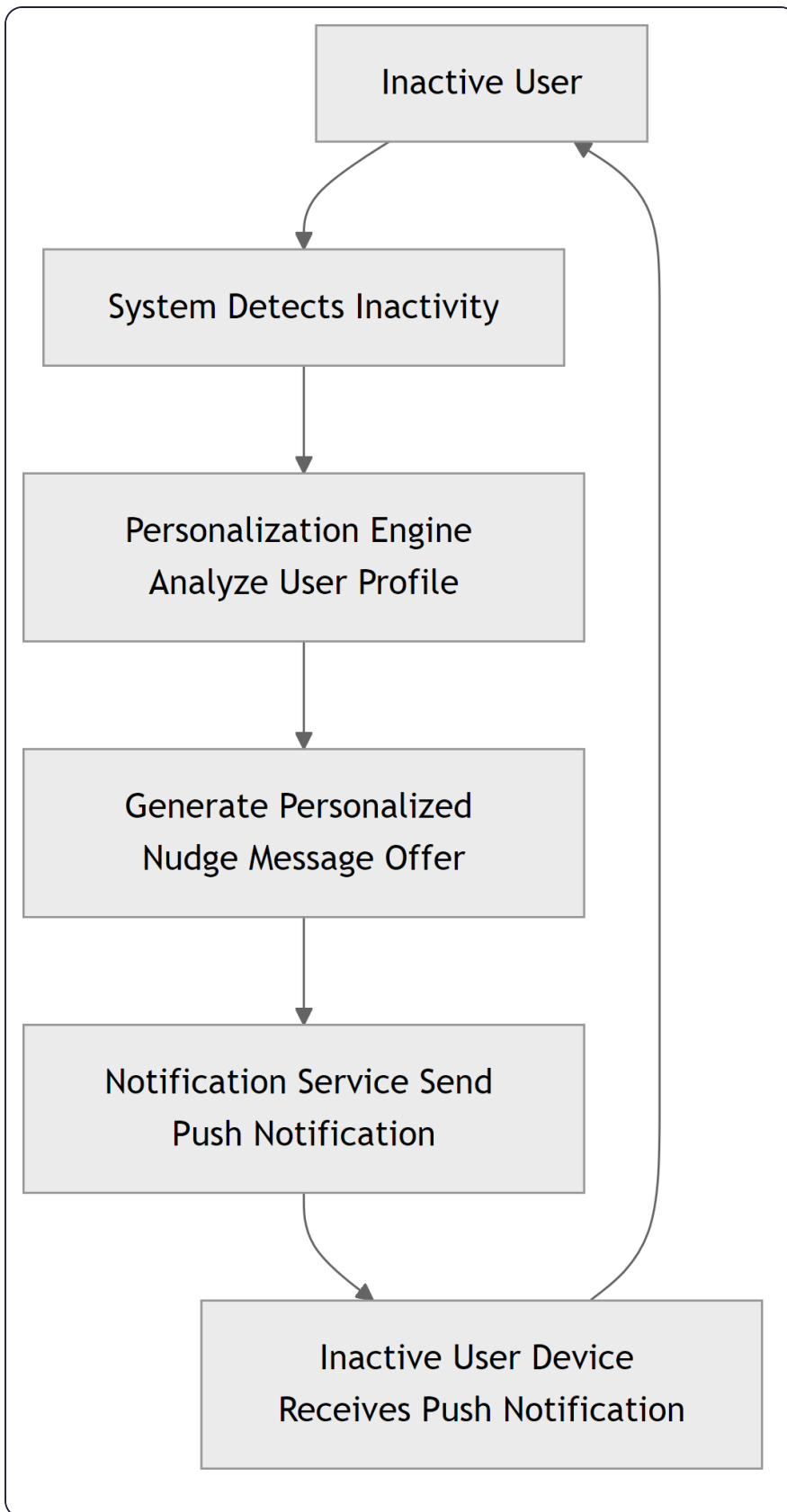
- **Preconditions: **
 - User has a registered and active wallet account.
 - User has completed a transaction (e.g., merchant payment, bill payment).
 - Personalization engine has access to user's transaction history and preferences.
 - **Trigger:**

Successful completion of a wallet transaction.

- **Main Flow: **
 1. The Active User completes a transaction using the wallet app.
 2. The Core Wallet System confirms the transaction.
 3. The Core Wallet System sends transaction details to the Personalization Engine.
 4. The Personalization Engine analyzes the transaction details (e.g., merchant category, amount, frequency) and the user's past spending patterns.
 5. Based on the analysis, the Personalization Engine identifies or generates a relevant personalized cashback offer (e.g., "Get 5% cashback on your next online grocery payment").
 6. The Personalization Engine sends the offer details to the wallet app.
 7. The wallet app displays the personalized offer to the Active User, typically on the home screen or in a dedicated "Offers" section.
- 8. **Postconditions: **
 9. User is aware of a personalized cashback offer.
 10. Personalization Engine updates user's offer history.
- 11. **Alternative Flows: **
 12. *No suitable offer found:* If the Personalization Engine cannot find a highly relevant offer, a generic offer or no offer is displayed.

6.2. Use Case 2: Receive Inactive User Nudge Notification

Diagram:



Detailed Scenario:

- **Use Case Name:**

Receive Inactive User Nudge Notification

- **Actors:**

Inactive User, Personalization Engine, Notification Service

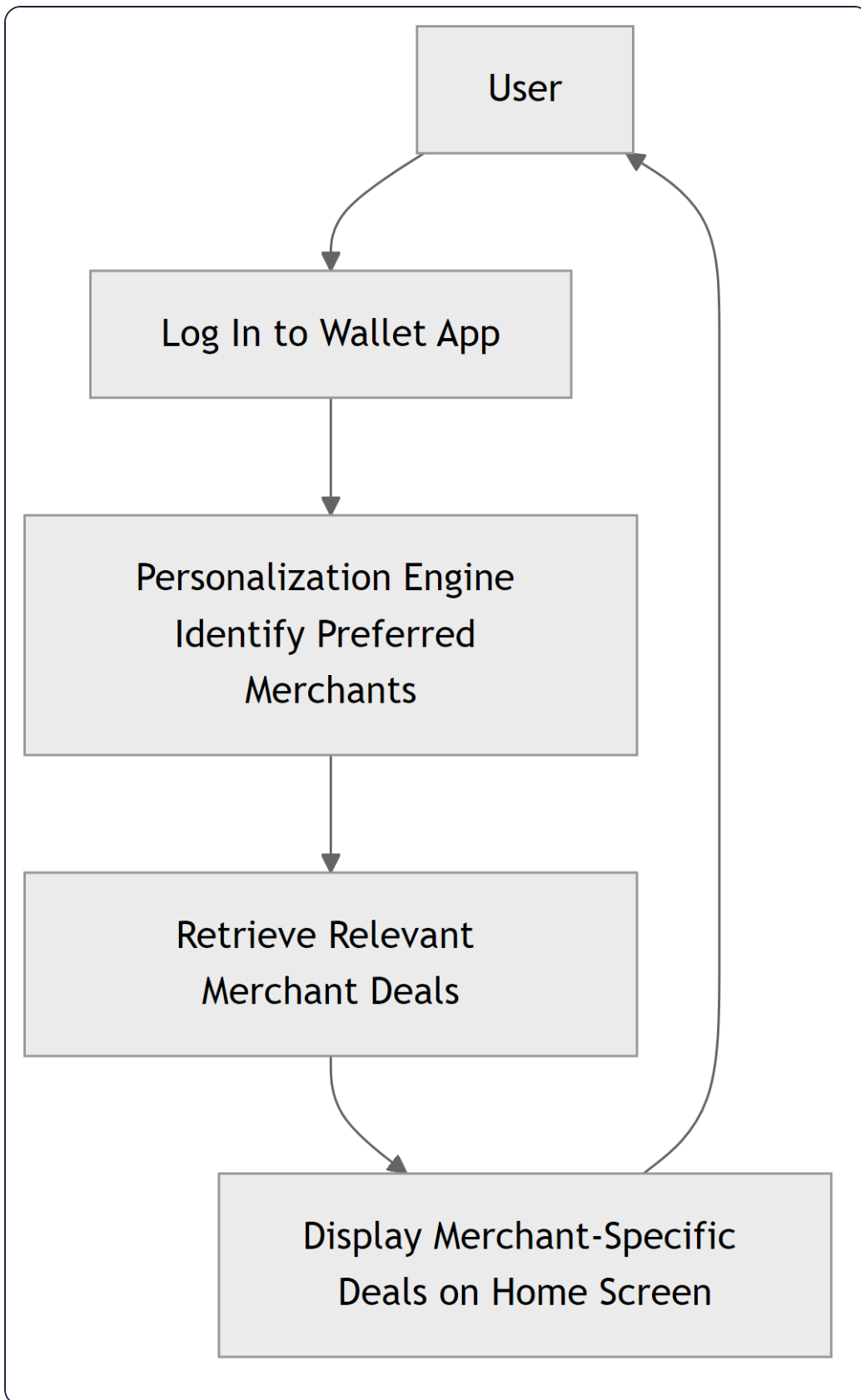
- **Preconditions: **
 - User has a registered wallet account but has not performed a transaction for a defined period (e.g., 14 days).
 - User has enabled push notifications for the wallet app.
 - Personalization engine has access to user's historical activity and inferred preferences.
 - **Trigger:**

Automated system check identifies a user as inactive.

- **Main Flow: **
 1. The Personalization Engine (or a scheduled job) periodically checks user activity logs.
 2. The system detects that a specific user (Inactive User) has met the criteria for inactivity (e.g., no transaction for 14 days).
 3. The Personalization Engine analyzes the Inactive User's profile, including past transaction types (if any), last login, and inferred interests.
 4. Based on the analysis, the Personalization Engine generates a personalized nudge message or a low-value incentive offer (e.g., "We miss you! Get \$1 off your next bill payment").
 5. The Personalization Engine sends the nudge message/offer details to the Notification Service.
 6. The Notification Service sends a push notification to the Inactive User's device.
 7. The Inactive User's device receives and displays the personalized push notification.
- 8. **Postconditions: **
 9. Inactive User is reminded about the wallet app and a potential incentive.
 10. Personalization Engine updates user's engagement history.
- 11. **Alternative Flows: **
 12. *User has disabled notifications:* Notification is not sent.
 13. *No specific offer possible:* A generic "We miss you!" reminder is sent.

6.3. Use Case 3: View Merchant-Specific Deal

Diagram:



Detailed Scenario:

- **Use Case Name:**

View Merchant-Specific Deal

- **Actors:**

User, Personalization Engine

- **Preconditions:* *
 - User has a registered wallet account.
 - Personalization Engine has analyzed user's past transactions or browsing behavior to infer preferred merchant categories or specific merchants.
 - Relevant merchant deals are available in the system.
 - **Trigger:**

User logs into the wallet application or navigates to the home screen.

- **Main Flow:* *
 1. The User logs into the wallet application.
 2. The wallet application requests personalized content from the Personalization Engine.
 3. The Personalization Engine identifies the User's preferred merchants or merchant categories (e.g., "coffee shops," "grocery stores," "Starbucks"). This is based on historical data.
 4. The Personalization Engine queries the available merchant deals and retrieves those relevant to the identified preferences.
 5. The Personalization Engine sends the selected merchant-specific deals to the wallet app.
 6. The wallet app displays these personalized merchant deals prominently on the wallet home screen or a dedicated "Deals" section.
- 7. **Postconditions:* *
 8. User is aware of merchant-specific deals tailored to their preferences.
 9. Personalization Engine updates impression logs for the displayed deals.
- 10. **Alternative Flows:* *
 11. *No preferred merchants identified:* Generic popular deals or no deals are displayed.
 12. *No active deals for preferred merchants:* A message indicating no current deals is shown, or other relevant content is displayed instead.

07. Data Mapping Sheet and Data Requirements Analysis

This table outlines the key data elements required for effective personalization, their sources, characteristics, and considerations.

Data Element	Source System(s)	Data Type	Frequency/Freshness	Purpose for Personalization	Availability (Y/N)	PII/Sensitivity	Data Owner	Transformation/Processing	Remarks/Privacy Concerns
User ID	Core Wallet System, KYC System	Alphanumeric	Real-time	Unique identifier for all user data	Y	PII	Core Wallet Product Team	Masking for analytics environments	Essential for linking all data.
Transaction	Core Wallet	Structured	Real-time	Spending	Y	Sensitive	Core Wallet	Aggregation,	Crucial for

Data Element	Source System(s)	Data Type	Frequency/Freshness	Purpose for Personalization	Availability (Y/N)	PII/Sensitivity	Data Owner	Transformation/Processing	Remarks/Privacy Concerns
History	System	(JSON/DB)		patterns, merchant preferences, transaction frequency, value			Product Team	categorization, anonymization	behavioral insights.
Merchant Category	Core Wallet System, Merchant Directory	Categorical	Daily/Weekly	Identify preferred spending areas	Y	Public	Core Wallet Product Team	Mapping merchant names to categories	Required for merchant-specific deals.
Transaction Type	Core Wallet System	Categorical	Real-time	Identify P2P, bill pay, merchant pay frequency	Y	Public	Core Wallet Product Team	Categorization	Key for targeting specific transaction types.
Transaction Amount	Core Wallet System	Numeric	Real-time	Average transaction value, budget insights	Y	Sensitive	Core Wallet Product Team	Aggregation, range binning	For value-based offers.
Login Activity	Analytics Platform, Core Wallet System	Timestamp	Real-time	App engagement, last active date, inactivity detection	Y	Public	Product/Analytics Team	Sessionization, count	For nudge triggers.
App Feature Usage	Analytics Platform	Categorical, Count	Real-time	Interest in specific wallet features (e.g., QR	Y	Public	Product/Analytics Team	Event tracking	To personalize feature promotion.

Data Element	Source System(s)	Data Type	Frequency/Freshness	Purpose for Personalization	Availability (Y/N)	PII/Sensitivity	Data Owner	Transformation/Processing	Remarks/Privacy Concerns
				scan, bill pay)					
Demographics (Age, Gender)	KYC System	Categorical	Static/Upon Update	Segmentation for broader campaigns	Y	PII	Compliance/KYC Team	Aggregation, anonymization	Limited use for personalization (ethics).
City/Location (from KYC)	KYC System	String	Static/Upon Update	Geo-targeted offers (if applicable)	Y	PII	Compliance/KYC Team	Geocoding	For local merchant relevance.
Device Info	Analytics Platform	String	Real-time	Push notification capability, device type	Y	Public	Product/Analytics Team	Device token mapping	For notification delivery.
Offer Redemption History	Marketing Platform, Analytics Platform	Boolean, Timestamp	Real-time	Offer effectiveness, user responsiveness to offers	N (Partial)	Public	Marketing Team	Aggregation, success tracking	Currently manual tracking, needs integration.
Last Marketing Interaction	CRM, Marketing Platform	Timestamp, Type	Daily	Overlapping campaigns, avoid spamming	N (Partial)	Public	Marketing Team	Log analysis	To manage user communication fatigue.

Data Requirements Analysis

- Current Wallet Data Collection:

The wallet currently collects KYC information, transaction history, and basic engagement logs. This forms a strong foundation for personalization.

- *Identified Data Gaps for Personalization: **
 - Offer Redemption History:

Currently, comprehensive, integrated tracking of which specific offers a user was shown and subsequently redeemed might be fragmented or manual. A robust, unified logging system is needed. * **Detailed Feature Usage:**

While general login activity is tracked, granular details on which specific features (e.g., P2P vs. bill pay UI clicks) are used or ignored by non-transacting users need to be captured systematically. * **Consent Management:**

A clear audit trail of user consent for data usage for personalization, beyond basic terms & conditions. *

**Minimum Viable Data for Pilot Personalization: **

```
1.  **User ID:**
```

Essential for identification. 2. **Transaction History:**

Core for spending patterns. 3. **Login Activity:**

For inactivity detection and basic engagement. 4. **Merchant Category (for transactions):**

To identify merchant preferences. 5. **Offer Status (available/redeemed):**

Basic tracking to avoid showing already redeemed offers.

08. Functional Scope Summary

8.1. In Scope

- **Personalized Recommendation Engine:**

Development or integration of an engine capable of analyzing user data and generating tailored offers, nudges, and rewards.

- **Offer Delivery Mechanisms:**

Implementation of capabilities to deliver personalized content via:

```
*  Wallet home screen widgets/sections.  
*  Targeted push notifications.  
*  Post-transaction upsell prompts.
```

- **User Segmentation Module:**

Tools to segment users based on behavioral and demographic attributes for targeted campaigns.

- **Gamification Module:**

Logic and UI elements for badges, streak tracking, and rewards.

- **Analytics Dashboard for Tracking Personalization Effectiveness:**

A reporting interface to monitor KPIs related to personalized campaigns.

- **Data Ingestion & Transformation Pipelines:**

ETL processes to feed relevant user data into the personalization engine .

8.2. Out of Scope

- **Core Transaction Processing Engine Enhancements:**

Changes to how payments, transfers, or top-ups are fundamentally processed.

- **Backend Settlement Changes:**

Modifications to the financial reconciliation and settlement systems.

- **New Payment Methods/Instruments:**

Introduction of entirely new ways to pay or new wallet funding options.

- **Customer Support Workflow Automation:**

While personalization may impact support, automating customer support processes is not part of this scope.

- **Deep Integration with Third-Party Marketing Automation Platforms:**

Focus is on in-app and direct notifications via the personalization engine, not necessarily full-fledged third-party marketing platform integration beyond notification services .

09. Suggested KPIs for Success Measurement

These Key Performance Indicators will be used to track the effectiveness of the personalization solution and measure the achievement of business objectives.

1. **Active User Transaction Rate: **

- **Definition:**

Percentage of registered users who perform at least one transaction in a given period (e.g., weekly, monthly).
*** Target:**

Increase from current 25% to X%. 2. **Average Transaction Frequency per Active User: **

* ****Definition:****

The average number of transactions performed by an active user within a defined period. *** Target:**

Increase by Y% for targeted user segments. 3. **Offer Redemption Rate: **

* ****Definition:****

Percentage of personalized offers viewed that result in a successful transaction or redemption. *** Breakdown:**

By offer type (cashback, discount), by user segment, by merchant category. *** Target:**

Achieve Z% redemption rate for personalized offers. 4. **Push Notification Click-Through Rate (CTR): **

* **Definition:**

Percentage of users who click on a personalized push notification. * **Target:**

Achieve A% CTR for inactive user nudges. 5. **Gamification Engagement Rate*: *

* **Definition:**

Percentage of users who interact with gamification elements (e.g., claim a badge, complete a streak). * **Target:**

Achieve B% engagement rate among users exposed to gamification. 6. **Wallet App Feature Usage Rate*: *

* **Definition:**

Increase in the usage of specific transaction features (P2P, bill pay, merchant pay) among targeted user segments. * **Target:**

Increase usage of targeted features by C%. 7. **User Retention Rate (Cohort Analysis)*: *

* **Definition:**

The rate at which users acquired or engaged via personalization remain active over time. * **Target:**

Improve 30-day and 90-day retention rates for personalized user cohorts. 8. **Customer Lifetime Value (CLTV)*: *

* **Definition:**

The predicted total revenue a user will generate over their relationship with the wallet. * **Target:**

Increase CLTV for users engaged by personalization.