Analytical Documentation — Loyalty System

# 1. Purpose of the System

The loyalty system aims to reward customers with points for purchases and allow them to exchange points for rewards. The system operates on a simple point model designed to increase customer engagement, brand loyalty, and purchase frequency. The system should be easy to use for both customers and employees handling transactions.

# 2. Main Functionalities

## 2.1 User Registration and Login

The end user (customer) can register an account by providing basic personal information: first name, last name, email address, and phone number. A password must also be created. After successful registration, the user can log into the system using their email address and password. The system should also provide a password reset mechanism.

## 2.2 Adding Transactions

A store employee (or POS-integrated system) can add a customer's transaction. The customer is identified by email or phone number. Each transaction includes the date, gross amount, and customer ID. The system automatically converts the amount into loyalty points – for every 10 PLN, the customer receives 1 point (rounded down).

## 2.3 Checking Point Balance

A logged-in customer can check their current loyalty point balance at any time. The system should also allow viewing the transaction and point redemption history.

## 2.4 Redeeming Points for Rewards

Customers can redeem their accumulated points for rewards listed in the catalog. Each reward has a defined number of points required for redemption. Before confirming redemption, the system checks reward availability and whether the customer has enough points. Once confirmed, points are deducted from the customer's account, and the reward is marked as redeemed.

## 2.5 Managing Rewards

The system administrator can add, edit, and remove rewards from the catalog. Each reward has a name, description, number of points required, and available stock. Rewards can be temporarily unavailable — the administrator can hide or mark them as such.

# 3. User Roles

The system defines three main user roles:  
- Customer: can register, log in, view point balance, and redeem points for available rewards.  
- Employee: responsible for adding customer transactions.  
- Administrator: manages the reward catalog and system users.

# 4. Data Structure (Logical Model)

## Entity: Customer

|  |  |  |
| --- | --- | --- |
| Field | Data Type | Description |
| ID | UUID / INT | Unique customer identifier |
| First Name | VARCHAR(50) | Customer's first name |
| Last Name | VARCHAR(50) | Customer's last name |
| Email | VARCHAR(100) | Email address (unique) |
| Phone | VARCHAR(20) | Phone number (unique) |
| Password | TEXT (hash) | Password hash |

## Entity: Transaction

|  |  |  |
| --- | --- | --- |
| Field | Data Type | Description |
| ID | UUID / INT | Unique transaction identifier |
| Customer ID | UUID / INT | Reference to customer |
| Date | DATETIME | Transaction date |
| Gross Amount | DECIMAL(10,2) | Purchase amount |
| Points Awarded | INT | Number of points for the transaction |

## Entity: Reward

|  |  |  |
| --- | --- | --- |
| Field | Data Type | Description |
| ID | UUID / INT | Unique reward identifier |
| Name | VARCHAR(100) | Reward name |
| Description | TEXT | Reward description |
| Points Required | INT | Points needed for redemption |
| Availability | INT | Number of items available |

## Entity: Redemption

|  |  |  |
| --- | --- | --- |
| Field | Data Type | Description |
| ID | UUID / INT | Unique redemption identifier |
| Customer ID | UUID / INT | Reference to customer |
| Reward ID | UUID / INT | Reference to reward |
| Redemption Date | DATETIME | Redemption date |
| Points Deducted | INT | Points deducted from account |

# 5. Example Use Cases

- Customer purchases for 123 PLN → system awards 12 loyalty points.  
- Customer collects 100 points and redeems them for a 'Company Mug'.  
- Administrator updates the reward description and changes required points from 100 to 120.  
- Employee adds a customer's transaction after scanning a loyalty card.  
- Customer views point redemption history.  
- System notifies customer about new rewards in the catalog.  
- Administrator temporarily hides a reward that is out of stock.

# 6. Non-Functional Requirements

- The system should be responsive and accessible from mobile devices.  
- Stored data must be encrypted (passwords, contact information).  
- The user interface should be intuitive and accessible to non-technical users.  
- The system must support 1000 active users simultaneously.  
- Operation response time should not exceed 2 seconds.

# 7. Advanced Functionalities

## 7.1 Tiered Loyalty Levels

The system supports customer segmentation based on their total points earned in the past 12 months. Loyalty levels (e.g., Bronze, Silver, Gold, Platinum) provide differentiated benefits:

|  |  |  |  |
| --- | --- | --- | --- |
| Level | Min Points | Bonus Multiplier | Exclusive Access |
| Bronze | 0 | 1.0× | No |
| Silver | 1000 | 1.1× | Yes |
| Gold | 3000 | 1.2× | Yes |
| Platinum | 7000 | 1.3× | Yes |

Customers automatically advance or degrade levels monthly based on their total points.

## 7.2 Referral Program

Customers can generate unique referral codes. When a referred person registers and completes a transaction, both users receive bonus points.  
  
- Referrer receives 50 points  
- New user receives 25 points  
- Each customer can refer up to 10 others

## 7.3 Birthday Bonuses

Customers receive an automatic bonus of 100 points on their birthday. The birthday must be set in their profile at least 30 days in advance.

## 7.4 Family Accounts

The system supports family accounts that allow multiple users to be linked under a single shared loyalty account. Each family account has a primary user (account owner) who can invite, remove, or manage additional members. All transactions and point earnings by family members are consolidated into the shared balance. Permissions can be configured per user (e.g., view-only, redemption rights). Family size is limited to 6 members.

## 7.5 Point Transfer Between Accounts

Customers can transfer points to other users by specifying the recipient’s email address and the number of points to transfer. The system verifies that the sender has enough points, and transfers are recorded as internal transactions. Point transfers are irreversible. Optionally, a short note can be attached to each transfer.

## 7.6 Promotions and Campaign Management

Administrators can define and manage promotional campaigns to encourage customer engagement. Promotions can be targeted (e.g., to specific tiers or user segments) and scheduled.  
  
Supported types include:  
- Double point days (e.g., weekends)  
- Product-based bonuses (e.g., extra points for certain SKUs)  
- Time-limited reward discounts (e.g., 20% off reward cost)  
- Welcome campaigns (extra points on first transaction)  
- Reactivation campaigns (targeting inactive users)  
- Tier upgrade accelerators  
  
Promotions include metadata such as name, start/end date, conditions, and status (active/expired).

## 7.7 Multichannel Communication (Omnichannel)

The system provides omnichannel communication tools for consistent customer interaction across email, SMS, push notifications, and web UI. Communication templates can be configured per event type (e.g., point update, reward redeemed, promotion announcement). Users can configure preferences and opt-out per channel.  
  
Additionally, communication history is logged per user, and the system provides metrics on open/click rates to support A/B testing of campaigns.

## 7.8 Reward Expiration Policies

Points and rewards may have expiration rules. For example, points expire 12 months after being awarded unless redeemed. Expiring points are notified 30 days in advance. Reward expirations are managed per reward definition. Administrators can override expirations manually.

## 7.9 Audit Logging and Compliance

All system activities, including logins, redemptions, point changes, and administrative actions, are logged with timestamps and user context. Logs are stored securely and retained for compliance and auditing purposes. GDPR and data protection regulations are enforced, including user-accessible logs and account deletion rights.

## 7.10 API Access for External Systems

A secure RESTful API is available to integrate external systems (e.g., POS, e-commerce, CRM) with the loyalty platform. API endpoints include customer lookup, transaction submission, point balance, redemption request, reward catalog retrieval, and referral code registration. Authentication uses API keys with scope-based access control.