Loyalty Rewards on Blockchain

Contents

1. Business Context

Loyalty program is a reward given to consumers on product purchased or service consumed from merchants. This reward transact in form of 'Reward point' feed on Reward Card or Point Card provided by merchant, Consumers can earn or redeem points on each purchase using Reward Card.

Loyalty programs have proliferated across travel, retail, financial services, and other economic sectors

2. Problem Definition

- Consumer have to enrolled different loyalty programs for same/different sector of merchants
- Consumers are confused with complex reward process and different schemes offered by merchants
- Low frequency of accountability noted in point redemption which drill down to merchant's selling power
- Merchants may expose to large liabilities on books based on awarded stale points.
- Rewards offered by card company loose payment volume and customer insight due to transaction executing from mobile wallets

3. Challenges

- Reward Programs offered by merchants are custom build, huge amount of money spent on owning loyalty system.
- There are no standardization on maintaining reward programs across merchants
- It would be difficult for small/midsized merchant to allocate cost for owning loyalty system
- Loyalty points offered to consumers directly tied to merchants, these points are non-exchangeable across merchants
- Consumer are getting difficulty to track loyalty reward for each merchants

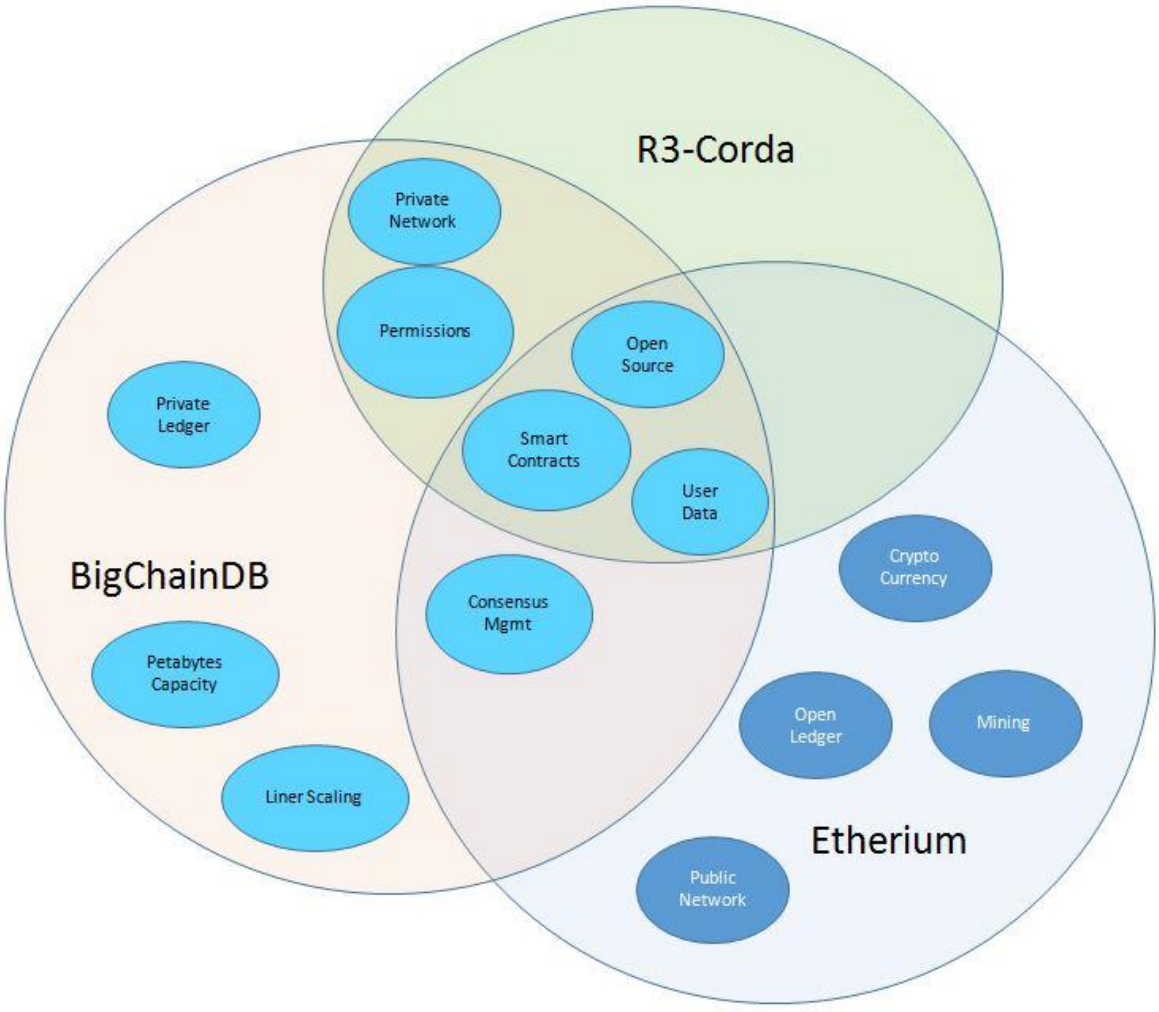
4. BlockChain Benefits

Value Driver	BlockChain Characteristic	Benefits
Reward Transaction	Shared Ledger	Consumers can get collective 'Reward Wallet' for all the merchants in mobile where they can immediately check 'point balance' of each enrolled merchant
Exchange Rewards	Transparency	Consumer can transfer reward points (which presents in form of digital token) to his/her friends and families, as well as exchange reward points across merchants
Business opportunities	Connected Network	While building a loyalty network, large loyalty rewards program providers with well-developed programs will have unique opportunities to offer value-added services to other businesses.
Secure transaction	Immutable transaction	Reward transaction/s on purchased from merchant to consumer is irreversible which prevent fraud of stale reward and any other type of manipulations of transactions.
Process Management	Reduce Cost	Cost savings will be identifiable on three major levels–

		system management, transactional, and customer acquisition. A blockchain-based loyalty rewards program reduce system management costs with smart contracts that report secure, tracked, transparent transactions to legacy systems, reducing costs associated with errors and fraud.

5. BlockChain Solution Approach

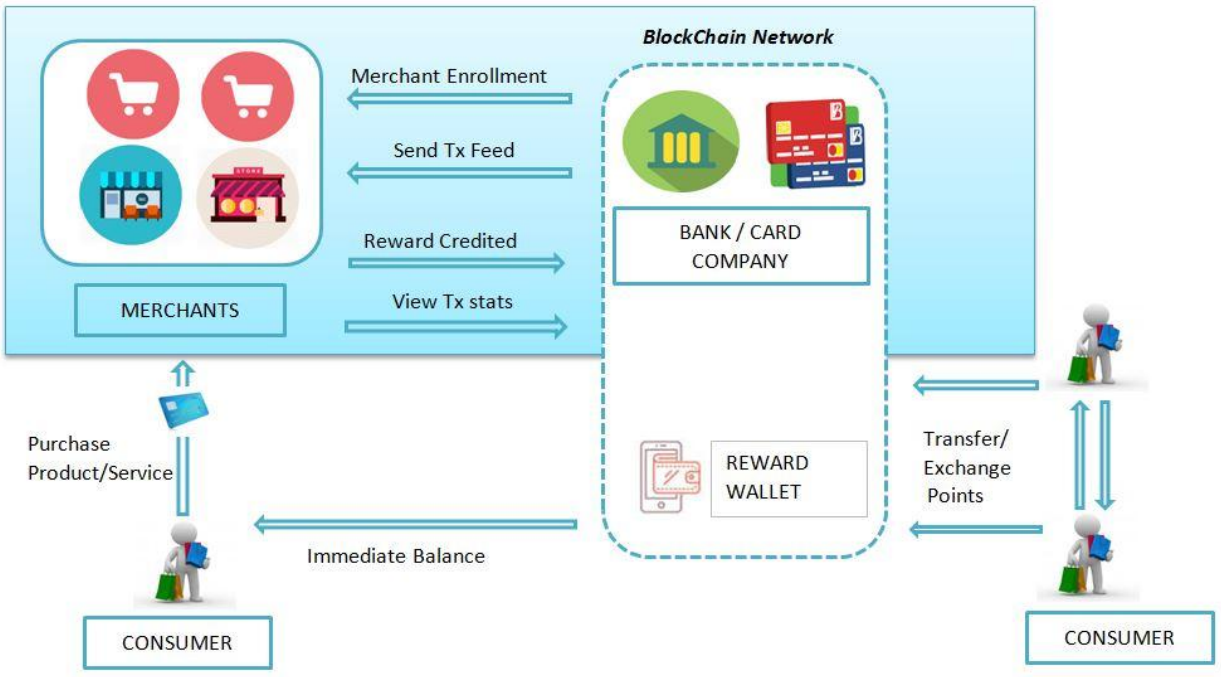
5.1 Platform Evaluation Specification



Here BigChainDB is selected as suggested option for Loyalty business case.

5.2 Functional Flow

The functional flow of Loyalty system is depicted as per below. Here Merchant, Bank or Card Company operates in a contiguous trusted blockchain network without any intermediaries and competitiveness. Consumer can connected with reward wallet from mobile interface.

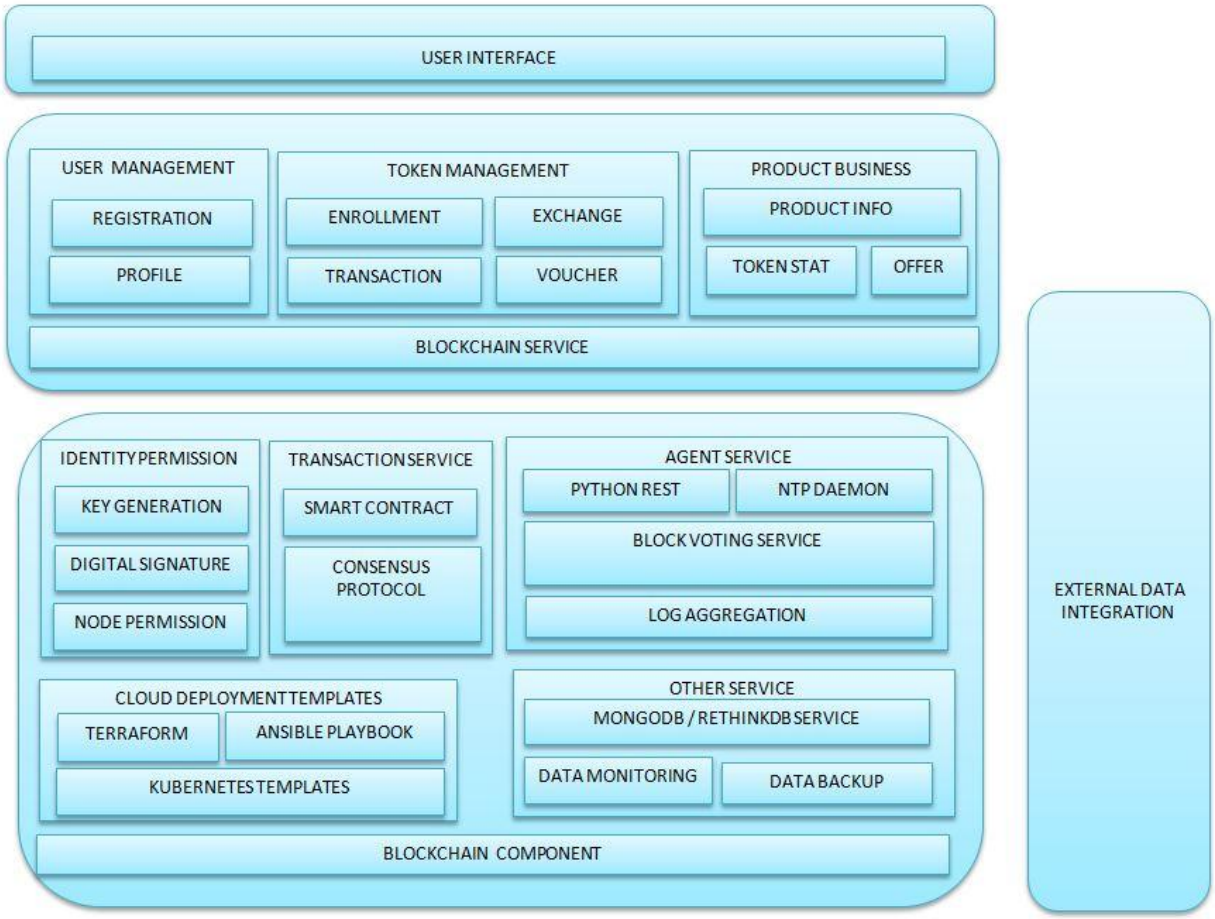


Solution will provide following functionality:

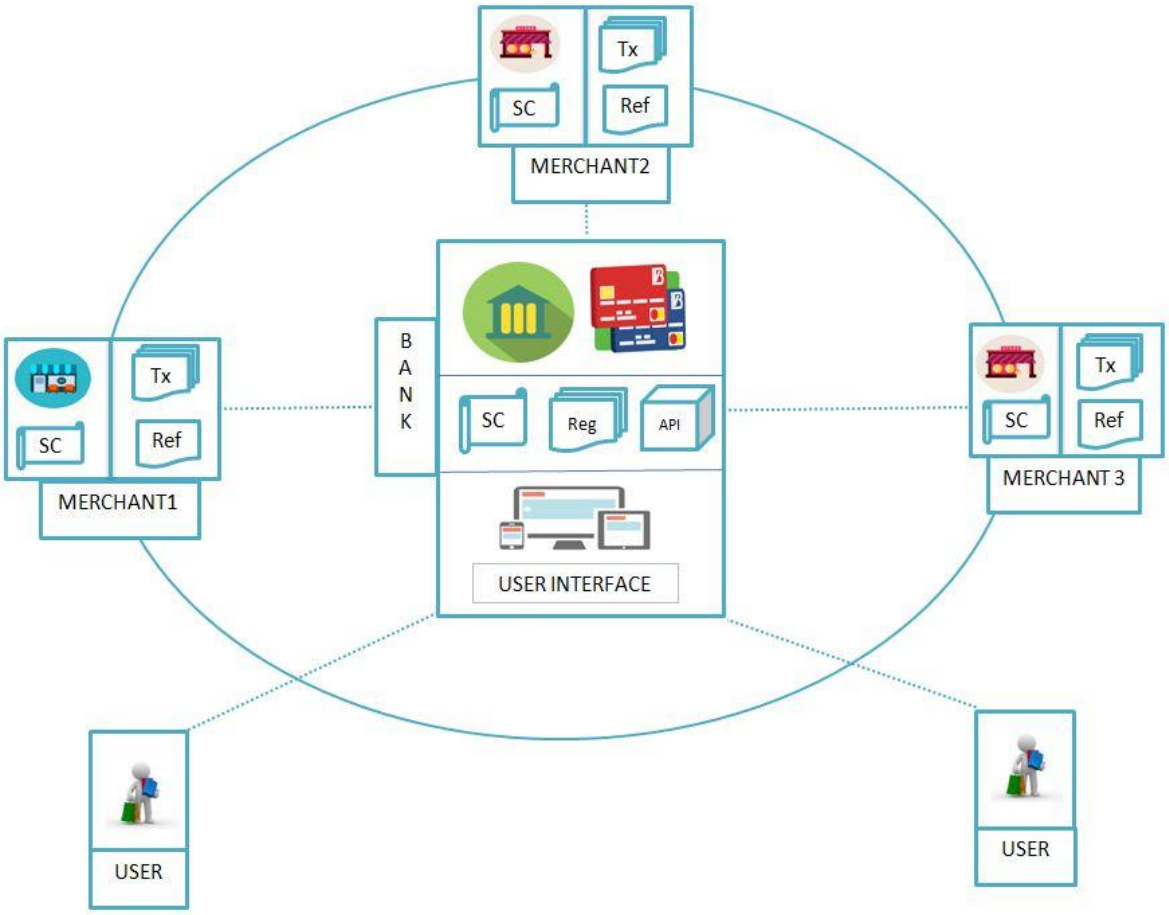
Feature	Actor	Action
Enrollment	Bank/ Consumer	Bank can enroll merchant with unique digital token which will be represent merchant's reward point Consumer enrolls merchants using mobile wallet provided by Bank/Card Company
Rate Configuration	Merchant	Configure earning value of point, redemption,UPS rate which can apply immediately as part of smart contract
Registration	Consumer	Register themselves in mobile wallet based on the card
Point Balance	Consumer	Check point balance of enrolled merchant
Transaction History	Consumer	Can read transaction history of point creation/redemption. They can transfer points to his/her friends/families
Decentralize Exchange	Consumer	Transfer points(token) from one merchant to another
Voucher	Consumer	Consumer can create voucher based on point balance
Wish list	Consumer	Consumer can put his/her wish list to selected merchant
Transaction Statistics	Merchant	Verify overall statistic of digital token
Offer Announcement	Merchant	Can set offer announcement, which will display message in consumer's wallet
Approve Wish	Merchant	Merchant can verify and approve wish of consumer

5.2 Logical Architecture

Representation of logical architecture view described below:



5.3 Deployment Architecture

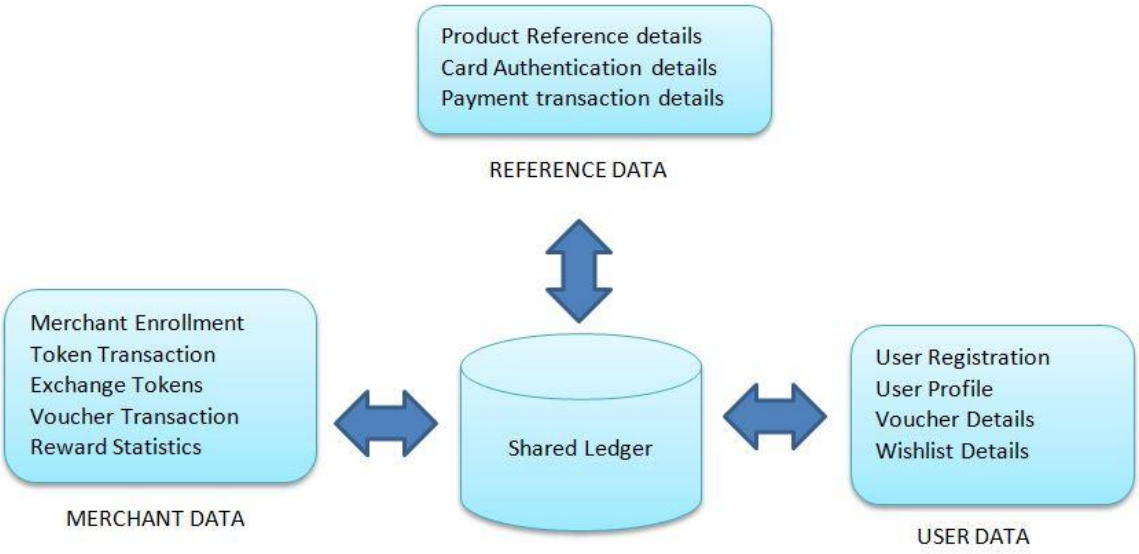


Bank	• Bank owns user interface which can be represented in Mobile/Tablet/Desktop • Bank maintains enrollment/registration data of merchant & user • Bank integrates Card authentication & transaction API for card verification and reward generation • Bank may contains smart contract of regulatory reward policy
Merchant	• Merchant contains enrollment data which could configure and executes as part of smart contract • Merchant contains shared transaction data & product reference database
User	• User will connected through reward wallet as user interface which can help them to check immediate balance, exchange points to another user

6. BlockChain Solution Components

6.1 Data Model

Following data model would be stored and shared between merchant and Bank/Card Company. This model will be stored in json format in BigChainDB



6.2 Smart Contract

Following details would be added as part of smart contract

Actor	Details
Merchant	Merchant's enrollment details like earning value of token, redemption of token, token expire value, token renewal date etc
User	Card authenticity & point generation based on purchase using Card

6.3 Integration Service

Actor	Service	Details
Bank	Card Authentication	User's card will authenticate while registration
Bank	Card Payment Transaction	Solution will integrate payment service which sends transaction feeds to blockchain solution for point generation

7. Platform Features/Capabilities

Here BigChainDB is selected based on the Capgemini evolution criteria for Loyalty use case.

- With the help of BigChainDB blockchain network, Merchant doesn't need to build Loyalty solution, it will create standardization for tracking loyalty points. they can get overall reward token statistics from common shared ledger
- Merchants can dynamically configure points creation/redemption rate which will be executed as part of smart contract
- BigChainDB has ability to create and transfer reward points without reliance on a central authority, it gives interoperability on rewards issued across merchants
- BigChainDB uses Big-Data as distributed database and comes with blockchain characteristics; it inherits advantage of high throughput, high capacity, a full features NoSQL query language and efficient querying and permissioning.
- BigChainDB can use MongoDB or RethinkDB as backend database, where MongoDB is trusted, enterprise-grade database comes with high performance and strong consistency
- BigChainDB provides deployment template which helps to deploy solution in cloud, for example – deploy BigChainDB node with AWS/ AZURE or with Kubernetes deployment template

