System Test Plan for a Customizable Rewards Allocation System

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System Test Plan

NFC Transaction Terminal Microcontroller Circuit Optimizations

Test	Steps	Validation Result
NFC Chip Interfacing	The Raspberry Pi can initialize the NFC chip with a readable URL	Pass/Fail
Open Transaction	The Raspberry Pi can accept a POST request which opens a transaction on the API and programs the NFC chip with the redemption URL	Pass/Fail
Remote Support	Microcontrollers will be sent preprogrammed to the business, if support is required remote access to the device will be possible. Requires appropriate router/modem setup.	Pass/Fail

QR Code Based Transactions

Test	Steps	Validation Result
Redeem points	QR code should be generated for the desired redeem amount. Merchant can then scan the code for customers to redeem.	Pass/Fail
Assign points	QR code should be generated for each transaction to assign correct points to customers.	Pass/Fail
Scanning distance	QR code should be scannable within 10 cm distance.	Pass/Fail

Merchant Control App Usability

Test	Steps	Validation Result
Enter total Payment	From the total payment page, merchant should be able to enter the total amount that user purchased	1 (Poor Usability) to 5 (Great Usability)
Enter total Inventory Item	From the Inventory Item page, merchant should be able to enter the total number of items that user purchased	1 (Poor Usability) to 5 (Great Usability)
Open QR Code Reader	From the home page, merchant should be able to scan QR code and perform transaction	1 (Poor Usability) to 5 (Great Usability)

Digital Wallet App Usability

Test	Steps	Validation
Sign Up / Login User	Pass in a username and password as arguments; success should return an ID for the user. New users will be presented with an app walkthrough.	1 (Poor Usability) to 5 (Great Usability)
Discover Businesses	On the Explore page users should be able to navigate businesses and view their details. From a business's page they can add their reward card to their wallet	1 (Poor Usability) to 5 (Great Usability)
Collect Rewards	From the Wallet page, users can select a card and open the Scan screen where they can scan their QR Code or tap with NFC to collect rewards. On success new points balance shown with animation.	1 (Poor Usability) to 5 (Great Usability)
Redeem Points	From the Wallet page, users can select a card and display their QR code where the business can scan it to redeem points.	1 (Poor Usability) to 5 (Great Usability)

Improve Backend API Cloud System

Test	Steps	Validation Result
Open Transaction	Pass a transaction amount and business ID in addition to the number of items OR ID's of inventory items; returns an ID to the created transaction object	Pass/Fail
Close Transaction	Pass a transaction ID and user ID; allocates rewards to the user for the business based on the businesses distribution model / transaction data; returns an updated point balance	Pass/Fail
Redeem Points	Pass a user ID, business ID, and a point balance to deduct points from the user's digital card for the business; creates a transaction record and returns an updated point balance or an error when insignificant points	Pass/Fail

NFC Transaction Terminal Microcontroller Casing

Test	Steps	Validation Result
NFC Communication	It should be possible to scan the NFC signal from the chip when it is encased	Pass/Fail
Casing safety	Users should be able to tap their phones on the microcontroller without risk of injury from sharp corners	Pass/Fail