

Walmart Problem Statement Solution

We intend to design a smart shopping cart that will enable shoppers to self-checkout i.e. without taking out any items that he intends to purchase.

Upon entering the store, the customer is supposed to scan his unique QR code against any available cart. The customer then gets logs in to that particular cart.

Our cart consists of an upper platform on which the customer is supposed to place the item, the item placed is scanned for the Bar Code, once the bar code is scanned, a motor actuates the platform in such a way that the item gets placed inside the cart.

Once placed inside, the product is added to the corresponding customer's bill. The customer is provided an LCD monitor attached on the cart through which he/she can look at all of his/her purchases. In this manner, the customer can take all the necessary items he wants to take and finally checks out of the store, by paying the final bill through his particular "Store Balance".

Certain Cases:

- What if Customer wants to remove any product: To remove any product, the customer has to remove and scan the respective product against an external barcode scanner. In case he does not scan the product through the external scanner, there will be an error message which will be displayed on the LCD screen regarding the "removed product not scanned" which will be generated on the basis of the difference of weight of the cart and that of the list of items on the screen. Once a cart gives an error message, no other activity w.r.t cart can be performed.
- What if Customer adds an item without scanning it: In this case too, the cart will display an error regarding the "not scanned" item being added. So customer must scan that item by placing it on the platform provided for scanning.
- There is a hack which is not a hack itself: Let say I remove an item which weighs 'x' and I add (without scanning) an item which weighs 'x' but costs more than the removed product, this is not possible because once the cart goes in error it will remain in that until and unless the removed product is scanned against the external scanner.

Technology Stack Used:

For our prototype version we will use the following technologies:

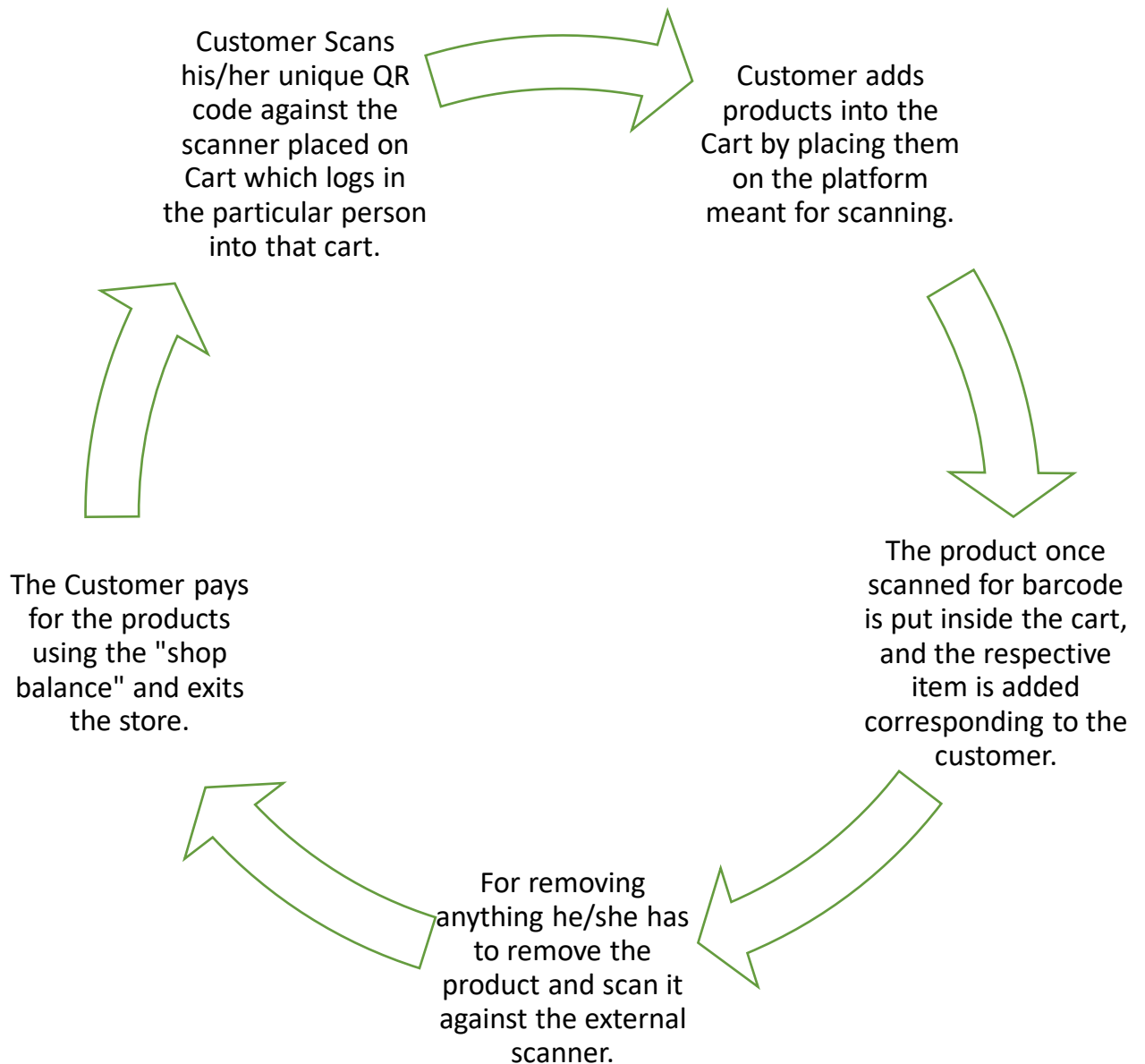
Hardware

- **Mechanical Cart**- a container in which products are kept.
- **Bar Code Scanner** - To scan the bar code on each item
- **QR Code Scanner**- To scan the QR Code to connect to the customer's account.
- **Piezoelectric Sensor**- To continuously measure the weight of the cart.
- **NodeMCU** – Wifi Module chip that can be configured to connect to the Internet i.e. send the data of the items in the cart to the database on the main server
- **Microcontroller** - To control piezoelectric, Display, NodeMCU and motors.
- **Servo Motor** – Used in the motor actuated ramp of the cart.
- **LCD Display**- To display all the information of all the items currently in the stack.
- **LED's**- **Green** LED would indicate that the items have been successfully scanned and **Red** LED would indicate either the item has been added without scanning or removed without scanning.
- **Power Supply**- To supply power to all the electrical units of the cart.

Software

- **Android Studio**- To make an app that will contain all the information about the user like name, address, bank details along with QR Code which when Scanned will connect the cart to the user's account. After the checkout final receipt would come on the app.
- **Backend**- MySQL and PHP.

Smart Cart Workflow



Sample Cart Design

