Project Name:

Smart Shopping Cart

Supervising Doctor:

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Project Team:

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Introduction to the current situation:

Once there are a lot of discounts and discounts or even on the normal days we will see an enormous rush at shopping malls or supermarkets on holidays and weekends., Now customers purchase all their needs and place them on the shopping cart, at the end, the payment process applies by standing in a large line to get the bill, This Large process applies by:

The casher scans the code on each product in the customer's cart using a code reader, and then each product is registered on the system, and after all the products are finished, the customer's purchase invoice comes out, and he can pay either by visa or cash.

This long process causes many customers to wait in the waiting lines, in addition to the great effort that the employee has to do.

Project idea to solve the problem:

This project deals with some solutions that can overcome the problems mentioned before by making a smart shopping cart that enables the customer to use it directly and easily by scanning each product when it is placed in the cart and has the ability to choose payment process he wants, using the online payment in a mobile application that attached to the smart cart or pays cash to the employee

Project Objectives:

- Facilitate the payment process for the customer.
- Reduce waiting time and get rid of long waiting lines.
- Consolidate technology into the shopping process in malls and shopping places.
- Increase the productivity of shopping places.

Project Description:

Initially, the project is divided into two parts (Hardware, Software)
The basic Functions that the project will contain is the following:

Hardware: (Code reader, Weight sensor)

The code reader will scan the product code placed on the cart then the weight sensor check if the quantity of the placed product match with the scanned product.
The main factor in determining the number of products that have been placed in the cart, through it, we will also keep the customer from stealing any product without paying for it.

Software:(Mobile Application)

Will be two mobile applications one for the customer mobile and the other placed on the smart cart.

Customer Mobile app features:

- It will show the number of used and available shopping carts for use.
- The customer can pay through it without resorting to cash payment.
- Bill history of the customer for customizing offers and recommendations.

Tablet app:

- A purchase invoice will appear containing all the products that have been placed in the shopping cart.
- As soon as you locate a product in the shopping cart, recommendations suggestions related to the product you have placed will appear on the screen.
- You can also search for a specific product if it exists or not.
- A map of the shopping place where the customer can search for the product he wants and will appear on the map and aims to facilitate the time and effort of the purchasing process.

Main Function:

- Scan product code.
- determining the number of products that have been placed in the cart.
- Online Payment.
- Search for a specific product.
- Number of used and available shopping carts.

Features:

- Map.
- Customize offers and recommendations.
- Multi-language app.

Used Technology:

1.Hardware

- AVR: Although powerful microcontrollers with higher processing capabilities exist in the market, 8bit microcontrollers still hold their value because of their easy-to-understand operation. -very much high popularity, ability to simplify a digital circuit, low cost compared to features offered, the addition of many new features in a single IC, and interest of manufacturers and consumers.
- Barcode Reader LS450: LS 450 Laser Barcode Scanner BIS Approved, Handheld 1 D USB Wired Barcode Reader Optical Laser High Speed for POS System Supermarket
- Bluetooth module.
- USB module Ttl connection With UART connection Microcontroller atmega32.

Weight Sensor

- Load cell: is a force transducer. It converts a force such as tension, compression, pressure, or torque into an electrical signal that can be measured and standardized.
- HX711: The SparkFun Load Cell Amplifier is a small breakout board for the HX711 IC that allows you to easily read load cells to measure weight. By connecting the amplifier to your microcontroller you will be able to read the changes in the resistance of the load cell.

2.Software:

Mobile App: Built with Flutter Framework so it can be available on both Android and IOS.

Tablet App: Built-in kotlin so it works in single-task mode and optimizes space and performance.

Working in a single-task mode and its main functionality is a shopping cart app that calculates the total price and checks on the products inside if they are successfully recorded so we can avoid any errors.

Connection Between Hardware and Software:

The intermediary of communication between the hardware and the server. Sending and receiving APIS holding data that comes out from hardware such as (weight of products, scanned barcode).

Backend:

The server will be an API that handles mobile requests. Using ASP.NET MVC technologies.

Project Plan:

- Embedded System
  - Weight Sensor.
  - Bluetooth Module.
  - Barcoder reader.
- Mobile app
  - Wireframe.
  - UI/UX.
  - End points.
- Tablet app
  - UI/UX.
  - End points.
- Backend
  - Database.
  - Server.

Approval Signature: