WCE
HACKATHON
2021

Round 1 : Idea Submission

Team Name : BiG BaNg

Team Leader : Ayan Ghosh

Theme : Crowd Management and Safety / Contactless System

Track : Expert

Project Name: Beat the Crowd

Project Abstract : This project mainly focuses on managing the crowd based on a given scenario of a supermarket where the people will not only be monitored in a systematic manner but also provides a better time management system which prevents the major problem of overcrowding.

What problem does it solve?

- We can manage the crowd in a systematic manner by keeping a proper head-count.
- We can virtually access the available products in a user-friendly interface.
- The payment procedure is much easier.
- Reduction of time taken for product searching.

Market Research:

- The lack of constant monitoring of the customers in a supermarket creates the place overcrowded.So a system will be required to keep a proper head count of the crowd.
- People often find it difficult to find their required product and go on searching for the product even after it becomes unavailable. This problem occurs because people are unaware of the product availability and thus a proper system is required through which each and every person will receive an updated information about the product and its availability which will make it easier for them to shop.
- Due to the global rise in population, it will be necessary to make the crowd management as efficient as possible.
  References:
- https://www.thehindu.com/news/cities/Kochi/crowd-management-in-shops-to-be-a-challenge-post-lockdown/article31281159.ece
- https://www.transparencymarketresearch.com/crowd-management-system-market.html
- https://www.ijltemas.in/DigitalLibrary/Vol.6Issue4/50-53.pdf

SI no.	Problem	Response	Count	Percentage(%)
1.	Overcrowding	Agree	75	75
		Disagree	25	25
		Total	100	100
2.	Availability of products	Agree	90	90
		Disagree	10	10
		Total	100	100
3.	Payment procedure	Agree	67	67
		Disagree	33	33
		Total	100	100
4.	Time Consumption	Agree	92	92
		Disagree	8	8
		Total	100	100

Technology stack:

- Web Development
- Internet Of Things(IOT)
- Flutter
- Google OAuth 2.0
- Arduino Uno (Microchip ATmega328P)
- NodeJS

Innovativeness and Showstopper:

The features that our team introduces not only helps in managing the crowd but also makes the shopping system more user friendly. To support this system and make it more innovative the following steps are taken:

- **HEADCOUNT MONITORING SYSTEM** - In this system, the count of each and every person in the supermarket will be monitored section-wise in a proper manner.

- **PRODUCT AVAILABILITY UPDATE SYSTEM**- In this system, the customers will be constantly updated with the number of products available in the respective sections which will make them aware of the information of products and reduce the time taken in searching for those.

Approach of Development:

Our team's idea mainly focuses on managing the crowd that occurs in the marketing system. It is often seen that a huge amount of customers entering the market leads to the lack of social distancing and time management. Many people who enter the market go on searching for their products being unaware whether the product is available or not, which generally increases the time of shopping and thus we introduce a **'Product Availability Update System'** which would not only help the customers get their desired product but also save time. Also we bring a **'Head Count Monitoring System'** which would help the staff or employees to keep a constant check on the number of people in a particular designated section of the market.

Firstly, we discuss the **'Product Availability Update System'(PAU system)**. In this system, an LED screen will be set up in front of each and every section of the market. On this screen, all the products available in that particular section will be displayed and updated constantly on every purchase respectively, it will also provide the location of each and every product present in that particular section in a form of map. When a customer is just about to enter the section, he/she will first look at the screen where he/she will be clearly informed about the products available and their prices. This will prevent him/her from wasting time unnecessarily searching for a product which is unavailable, providing clear information thus preventing the crowd from increasing any further. Also this will be a major step towards time management because people will not waste their time searching for their products. For example, there are 20 apples in the fruit section. A customer purchases 14 apples and once the billing is done, the number of apples in the section will be updated by reducing the number by '-14' which means there are 6 apples remaining in that section and this information will be instantly uploaded on the screen. This will help the next customer interested to buy apples get clear information about the number remaining. We will also provide a web app whose function would be exactly like the LED screen in front of each section, it will help the customer to know about the available product in advance. We will make the app using flutter, for user authentication we will use google OAuth 2.0.

Secondly, we will introduce a complete new system called the **'Head Count Monitoring System'(HCM System)**. In this system,there will be a monitor and two sensors in each and every section. One sensor will be set at the entry and another at the exit. Every customer will walk through the sensor near the entry just before entering the desired section. This sensor will be designed with the knowledge of Internet Of Things(IOT) with the help of arduino uno. On entering , a '+1' increment (Up-counter) will be sent directly to the monitor where the following number will be displayed. Eventually, their head count will be added to the monitor and displayed respectively. After purchasing the product, when the customer is just about to leave through the exit, he/she will walk through the second sensor near the exit. The sensor will decrease the head count by '1'(Down-counter) and similarly the headcount will be adjusted. This way every customer entering and leaving a particular section will be monitored properly by keeping record of his/her headcount on the monitor. This will help the staff/employees working in the various sections of the market to properly monitor the number of customers inside the sections and accordingly deal with them if the count exceeds the limit. This idea mainly targets in managing the crowd by keeping a check of the number that will be displayed on the screens of the various sections. This makes the marketing system more organised.

Case Diagram