RETAIL INTELLIGENCE

Arya Nair [1], Darshi Patel [2], Prof. Ajaykumar T. Shah[3]

Department of Computer Engineering
[1,2] Alpha College of Engineering & Technology, Gujarat, India
[3]H.O.D, Alpha College of Engineering & Technology, Gujarat, India

Abstract- *As technology continues to evolve consumer behavior does too and retailers need to stay ahead of the curve. As we move rapidly into the shopping trends and seasons, what the biggest challenge faced by the consumers are the long and tiring queue at the counters. Due to such challenge the retailers tend to lose certain amount consumers. Using the proposed project, we plan on eliminating such challenges and making the shopping experience of the shoppers easy. For our project, we make use of AI and smart camera, using which we would be calculating the number of customers entering and leaving the shops. It will also calculate the number of shoppers at the billing counters. And then at last we will be comparing both i.e. number of customers entering but no present at the billing counters and so the store managers and work accordingly. Another aspect of our project would be, at a particular counter, if the queue exceeds the given threshold, the system will automatically send out a notification regarding the extension to the store manager. After sending out a notification the same would be feed into the feedback database. And this data will be visible to assistant manager, department manager, general manager, regional manager, and so on. Using such analysis the manager will be able to take necessary actions to ease the customer experience accordingly.*

Keywords- Alert Notification, Artificial Intelligence, Billing Counter, Business Intelligence, Retail, Supermarket.

I. INTRODUCTION

As we move rapidly into the shopping trends and seasons, the biggest challenge faced by the customers are the long and the tiring queues at the billing counters. At times the customers enter the store but due to long billing queues they do not buy anything and decide to leave. Due to such situations the retailers tend to lose certain amount of consumers. So, in this system, we can count the number of people entering, the number of people at the billing queues so that the store managers can manage the long billing queues accordingly.

Our main aim is to increase the retail rate of the stores. If the billing queue exceeds the predetermined threshold then it will notify the manager and the staff which will help the retailers in managing the customer service. This technology will enable customers to improve their shopping experience.

II. LITERATURE REVIEW

In today's challenging business environment, it is a vital for organization to access useful information and knowledge. Business Intelligence (BI) is an umbrella concept for tools, techniques and solutions that helps managers to understand business situation. And BI tools can support informational knowledge needs of organizations. With respect to increasing trend of BI researches in BI concepts and applications, in this paper, recent researches and papers of academic journals in this field is systematically review to classify and prioritize the concepts and approaches of business intelligence. Consequently researches was classified in three, managerial, technical and system enables approaches to BI, and specification of each approach and future research quid was described.

As the world is growing more towards the digitalization, one of the main focus by the retailers and supermarket franchises would be customer retention. During the festive seasons the number of people visiting the stores increases by twice the normal amount, due some reasons the stores are unable to take proper measures in order to maintain a perfect shopping environment. As the human nature intends, not many are able to wait in long queues and many even due to this reason won't choose on shopping from that particular store, i.e., avoiding shops with large number of people. This might turn out to be a negative factor for the retailers and the supermarket franchises. Another problem would be the customers never revisit and may choose to shop through an online ports.

III. METHODOLOGY

The proposed system, will make use Artificial Intelligence and smart cameras. The system will be used in supermarkets to manage the crowd. There will be virtual line which will help maintain the crowd at a particular counter, on exceeding which an alert notification will be sent. Managers and staff will be able to review the same and act accordingly.

The system will work min the following way:

- Getting the count rate of people entering and leaving the store: In this system, we need a count rate of the people entering and leaving the store, which is done and that data is managed.
- Getting the count rate of number of people at the billing counters: Count Rate of the number of people at each billing counter is also obtained simultaneously as we count the number of people entering and leaving the store.
- Comparing count rate of people entering-leaving and the count rate of customers at the billing counters: Here, the count rate of people entering and leaving will be compared with the count rate of the customers at the billing counters, so that the supermarket team can get an idea about the number of people entering but not buying anything. In the worst case, the module will generate an irrelevant response but it won't fail to generate the comparison unless it's a hardware problem.
- Sending an alert to the supermarket staff: It will be having a predetermined range at the billing counters, so that if that virtual line exceeds than it will get detected and will send an alert notification to the supermarket staff so that they can manage the crowd and billing queues accordingly. In the worst case, the module will generate an irrelevant response but it won't fail to generate the comparison unless it's a hardware problem.

There have been tremendous efforts by lots of people to develop a system that can help the customers to improve their shopping experience. There are certain systems close to our systems but there is no system that detects the long queues at the billing counters and sends an alert notification to the staff on exceeding billing queues above the predetermined thresholds. In fact there is a lot of research going on this subject and people are trying to find different new solutions to the problems. We are hoping that our system may solve this issue, we are using advanced methods to come to an appropriate solution of the problem.
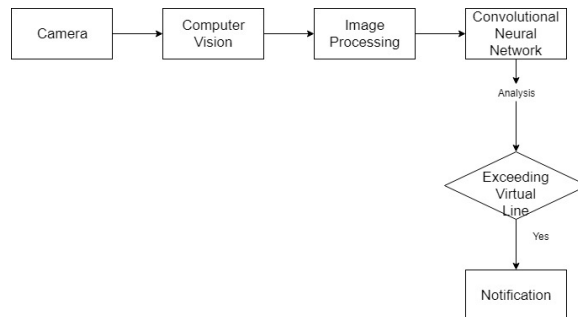
Then modules used in our proposed projects are as follows:
- Business Intelligence
- Image Processing
- Video Analytics
- Notification Module
- Data Analysis

Flow diagram for our project is as follows:
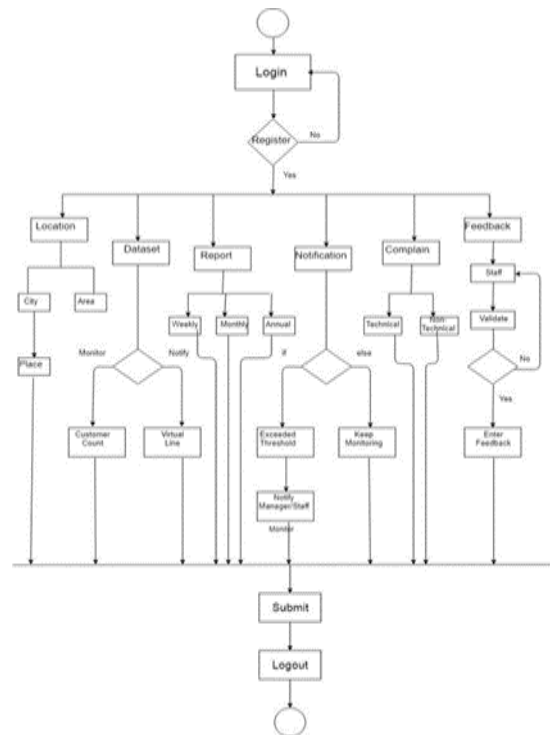
Flow Chart:

Features:

- Computer Vision
- Virtual Line
- Notification
- Calculating crowd at supermarket
- Comparing crowd in supermarket and billing counter.

IV. CONCLUSION

The Retail Intelligence is a system for supermarkets, using this the staff of the market can get an alert on the increasing queues at the billing counters. This is mainly used for proper management at the supermarket. Currently, devices and tools

developed to address this issue are limited in their capacity. Here, we give them the system that senses the number of people at the billing queues, which will accordingly give them a brief idea on what measures to take at times when the supermarket is crowded. We hope to solve this long going problem and help the supermarket team so that they can manage their store in a better way.

ACKNOWLEDGEMENT

FUTURE ENHANCEMENT

We aim to build a system that can assist the supermarket staff to manage the crowd at their store. This project is our first step towards this goal. We have planned that we can add numerous features in this system to help the customers as well as the supermarket in both different ways.

- **Better Design:** The main challenge that we have identified is related to the design. We will be constantly working on design to make this system easy to use.

- **Better Working:** We will be constantly working on our algorithms to improve the accuracy and performance.

REFERENCES

Books:
[1] Headfirst Java- Bert Bates & Kathy Sierra (2003).
[2] UML for Java Programmers- Robert Cecil Martin (2003).
[3] Programming in Python- Mark Summerfield (2008).

Website:
[4] Queue Management Analysis (http://www.3vr.com/products/videoanalytics/queueline)
[5] Customer Insights (http://www.3vr.com/products/customer-insights)
[6] Retail (http://www.3vr.com/industrysolutions/retail)
[7] Webserver and SQL Database (https://www.paessler.com/manuals/ipcheck_server_monitor/builtinwebserverandsqldatabase)
[8] Business Intelligence (https://searchbusinessanalytics.techtarget.com/definition/business-intelligence-BI)