

Problem Statement:

In retail industry, people counters are often referred as footfall counters and traffic counters. Many of the retail industry are **unable to remotely keep track and having an accurate count of visitor in their brick-and-mortar store across the nation**. Other than getting the data from their Point-Of-Sale System (POS) transaction, monitoring business sales for multiple stores across the nation is quite challenging without a proper retail analytic data proven. A POS system only provide an abundance of crucial data about the retail, so it is possible to extract those number of transactions and use it as a ballpark figure for the daily number of visitors. However, this does not give an insight about the real footfall in the store, it does not show the number of people at the store at a particular time or the length of stay of a visitor in the store and conversion rate of a visitors.

Besides, **the lack of direct relationship with shoppers and creating a more personalized, unique in store shopping experience** has also led a declined of sales for retailer that has multiple stores across the nation. Due to they are unable to capture the overview thoughts and preferences of the visitor such as the weather which visitor mostly visit the store and the dwell time they spent in the store. Therefore, the need of understanding foot traffic of shoppers in store is important for the growth of business. By understanding foot traffic of the shoppers, people counting solutions has became one of the solutions that are implemented with technology like stereo vision technology or thermal sensor technology. As for the new normal of pandemic, social distancing is one of the key elements that is needed to take into consideration for the people counter system. In which, occupancy management solutions have taken place to monitor and control social distancing to give reassurance to shopper and worker that their health and safety is the highest priority.

Objectives:

- To better understand customer behavior and measure to improve marketing efforts.
- To understand external factors that affects business.
- To assess and compare the performance of different retails stores.

Solutions:

People counting solutions

- People counting technology was the tool used for retailer to monitor metrics like the footfall and average visitor spend. Optimization is the main reason which makes measure foot traffic in store important. So that the collecting of data about customers and their behavior will help to make smarter business decisions that affect store operations and marketing strategy.

Create a people counter system using thermal sensor and occupancy management solution.

- A people counter system which is implemented with thermal sensor can keep track on the number of visitors who visited the store. When the system detected body heat radiation it will reflect the counting on the system.

- With occupancy management solution, it can help to maintain and make sure that social distancing is practiced during the new normal of pandemic. This is to assure that physical distance and the safety of the shopper has taken into consideration and prevent overcrowding in certain environment. A capacity limit can be set to show alert on the dashboard once it reaches the limit in the space area.
- People counter software can also improve queue management and staff scheduling in foot traffic counting. This is because it can help customer service teams to plan cashier shift better and consider on adding more shop floor assistant during peak hours to enhance the customer experience in store and not only during checkout.

Project Scope:

In the project, we have to come out with the algorithm for people counting in and out of the entrance or exit. It needs to involve the receiver and transmitter to detect human walking in and out of the entrance. Then the integration of thermal scanning which use heat map sensor to detect the body heat of human and occupancy management solution to count the capacity-limited area.

Diagram:

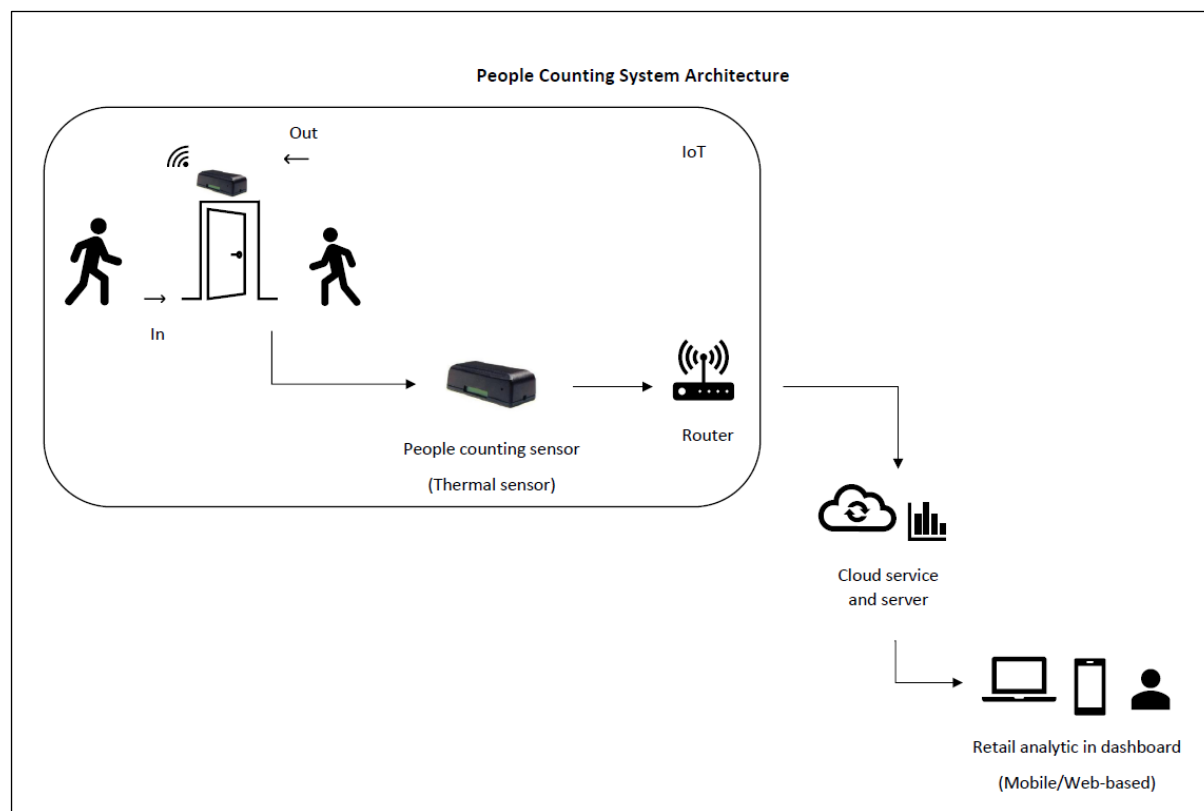


Figure 1: People Counting System Architecture

Above figure 1 shows the architecture of people counting system, people counting sensor is place overhead to count the number of visitors who enters and exits the entrance using thermal sensor. When the thermal sensor detects body heat of the visitor, it will count the number of visitor and save the data into cloud service and server. An integration between the cloud data will show the retail analytic for the user in their dashboard in either mobile or web-based to keep track on the number of visitor and the occupancy of the visitor in store.

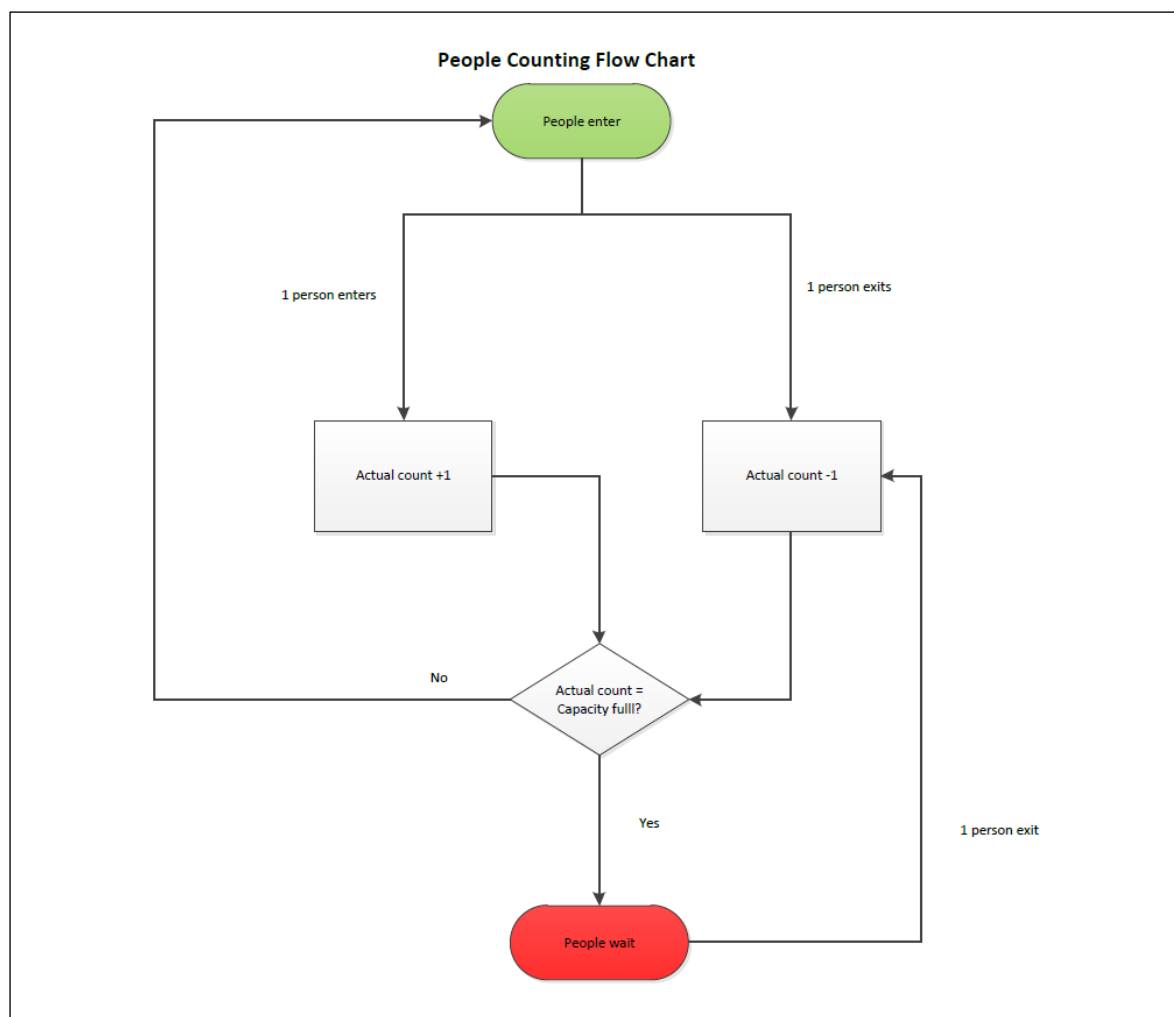


Figure 2: People Counting Flow Chart

Figure 2 shows the people counting flow chart which shows how people counting system works. First, when the visitor enters the store, it will add count to the actual count then the system will check the number of limits that have been set in the system. If the capacity is not reached, then visitor can enter the store while once the capacity has reached its limit then the visitor must wait for another visitor to exit from the store before they can enter the store. This occupancy management solutions ensure that the store does not overcrowded with people and prevent close contact between each other.