

Q-CAM: QUEUE MONITORING SYSTEM USING CAMERA

**Farah Nadiah Mohammad Ramlee, Radzi Ambar, Mohd Helmy Abd Wahab,
Chew Chang Choon and Muhammad Mahadi Abd Jamil**

Department of Electronic Engineering, Faculty of Electrical and Electronic Engineering,
Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia
Email: aradzi@uthm.edu.my



INTRODUCTION

- ✓ Queuing system in a customer service can be described as a system where the arrival of customers is the input and the served customer as the output
- ✓ Systems currently implemented in Malaysia is General Microsystem (GMS) and had been enforced at most oriented companies.
- ✓ Nowadays, customer services oriented companies encountering difficulties of long line queue. These problem often occurred in banks, Urban Transformation Centre (UTC), hospital and post offices and it is getting worse from time to time.
- ✓ Regarding this issue, there are few alternative ways to manage and improve the system by taking control the customers' queuing experiences with e-services or mobile queue system.

PROBLEM STATEMENT

- ✓ The queue management system has mostly operated at many sector and it system is designated efficiently and it is a systematic way to ensure disciplined and guided-customer service.
- ✓ Problem arise when queue become longer than anticipated and increase wait times.

In this work,

- ✓ Mobile Queue Counter Monitoring System has solution which enables customer to take control of queue congestion by virtual and ease the customer without being at the premise.
- ✓ The customer only need to queue from a mobile device and this can minimised the long line as they can monitor the queue flow.
- ✓ The propose design will not require the users to buy new queue counter devices but it will serve as an add on devices for existing queue counter devices in premises.

OBJECTIVES

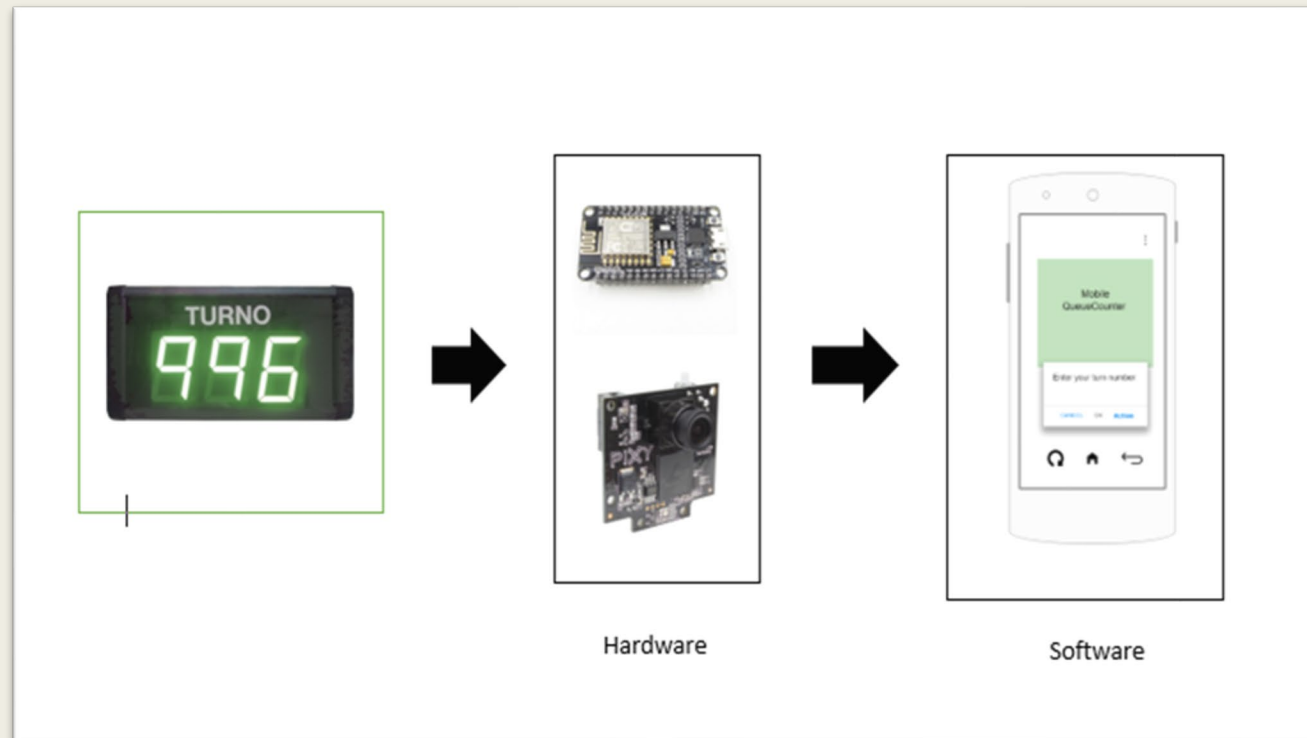
1. To design and develop a queue counter monitoring system based on ESP32 camera and FTDI Programmer.
2. To develop smartphone application that can display queue counter on Android-based smartphone.
3. To verify the effectiveness of the propose mobile queue counter monitoring system via actual experiment.

SCOPE

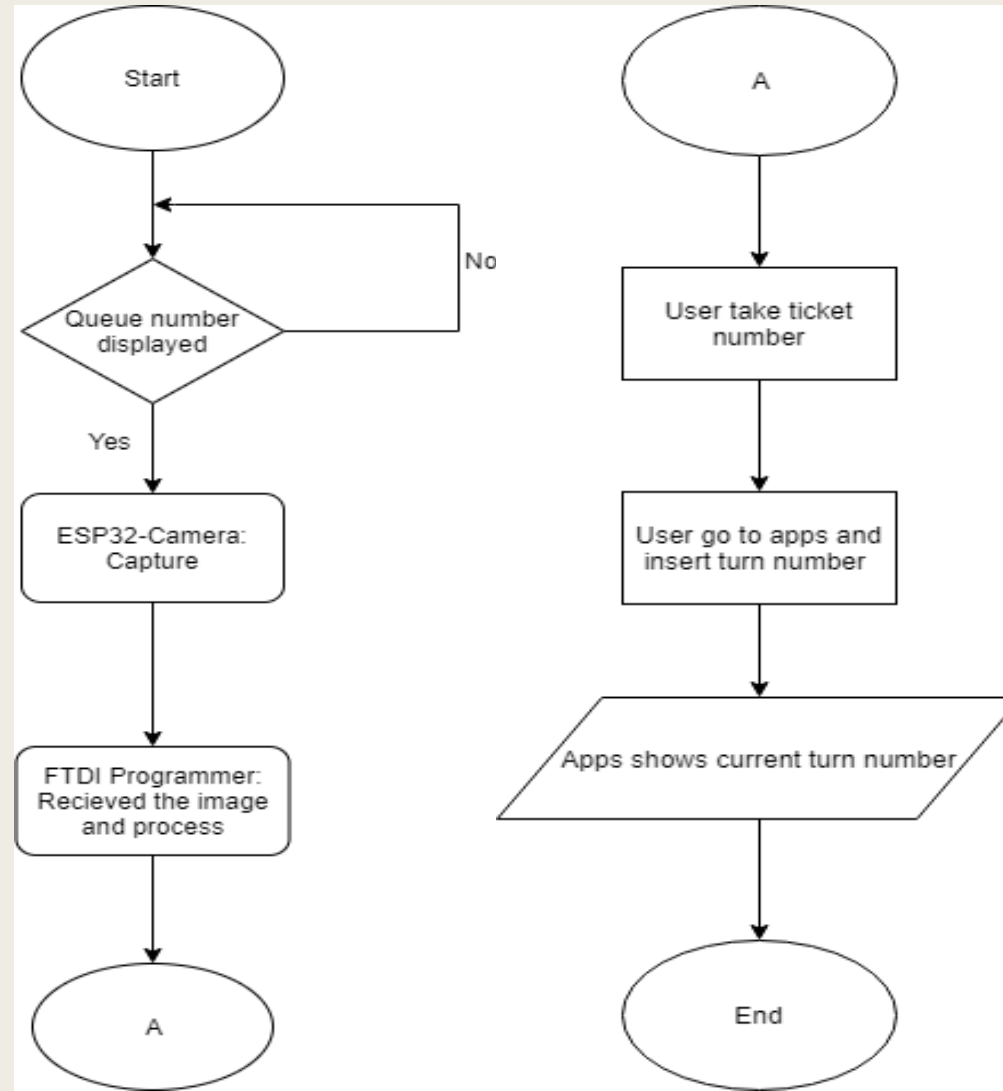
1. The queue monitoring system use the existing queue counter device and the image of the counter will be captured and send to smartphone.
2. The hardware for the propose queue counter monitoring system will consist of a camera (ESP32 camera) and a FTDI Programmer.
3. A smartphone application will be developed by using MIT App Inventor. The developed application will be developed for Android smartphone only.
4. The developed system is for a single queue counter device only for proof-of-concept.

METHODOLOGY

➤ Block diagram of Mobile Queue Counter Monitoring System



Flowchart of Mobile Queue Counter Monitoring System



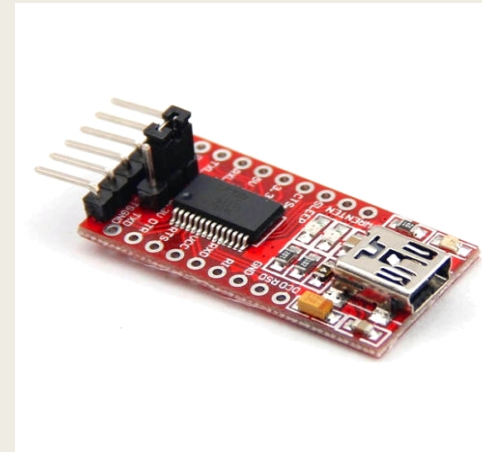
Hardware development

ESP32 CAMERA



- Support Interface:
UART, SPI, I2C,
PWM
- Operates at 3.3V

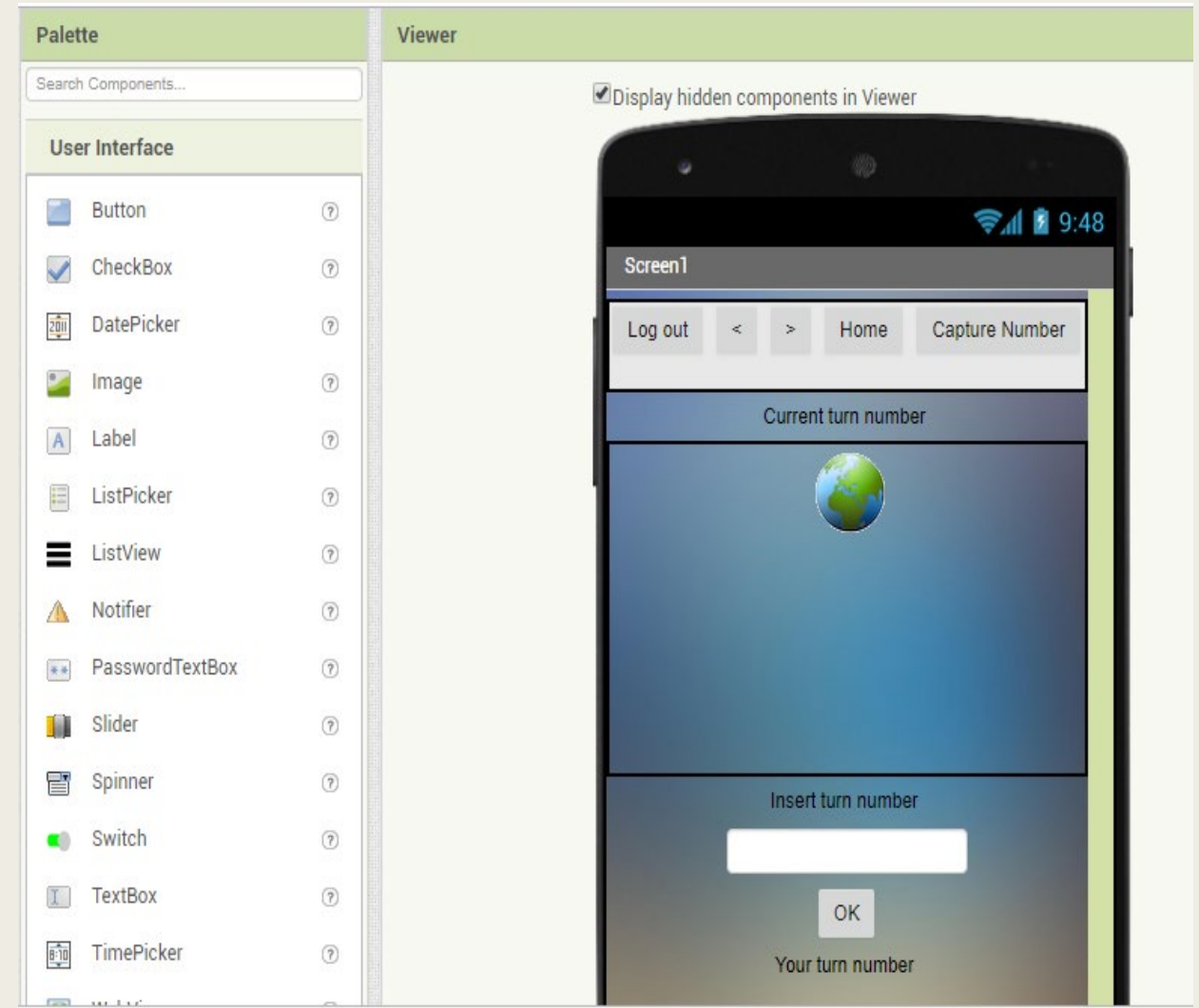
FTDI Programmer



Converting TTL serial transmission to USB signals and to upload code through the UOR and UOT pins (serial pins)

Software development

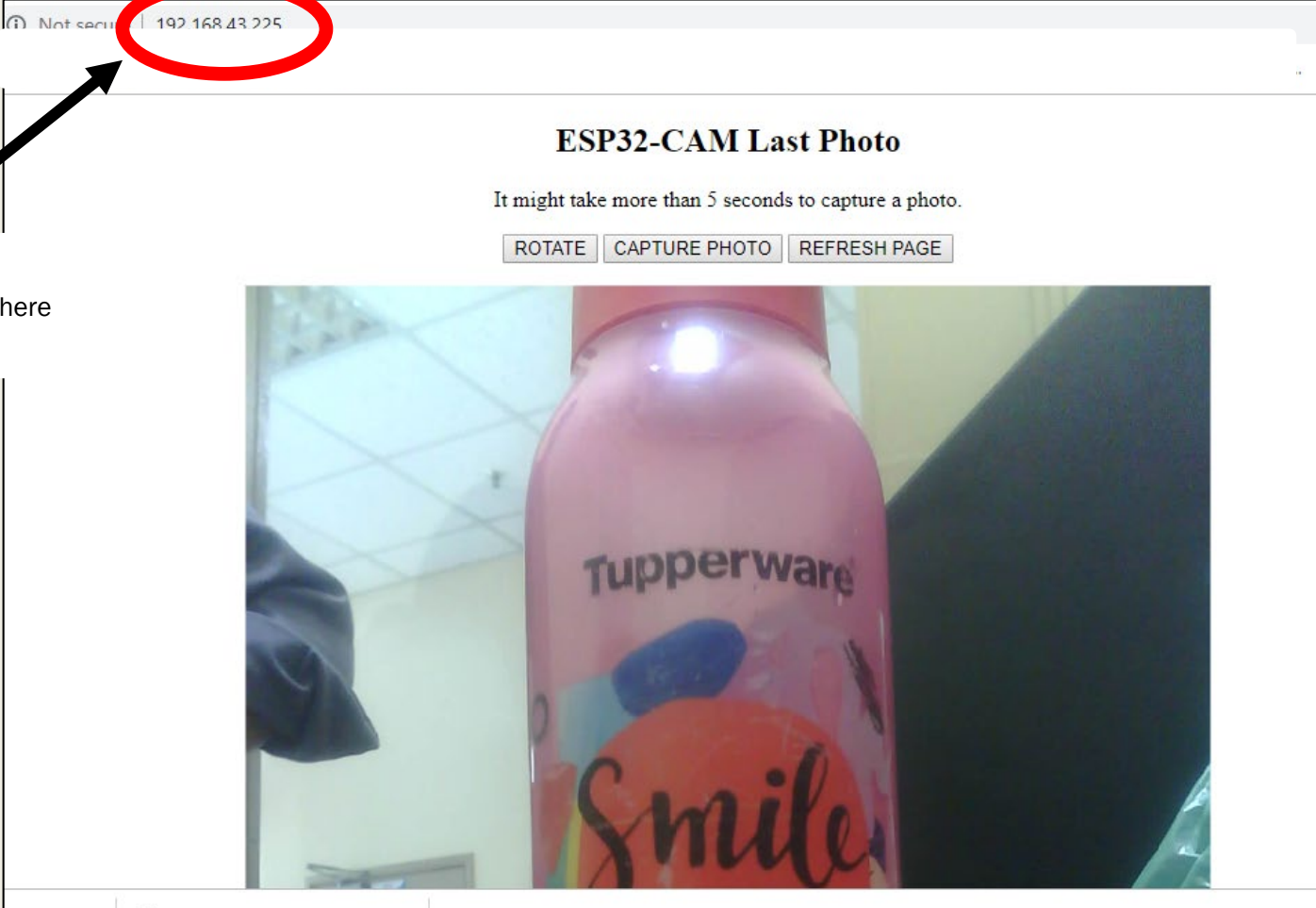
MIT App Inventor



EXPERIMENTAL RESULT



- The test captured can be observed on the ESP32 camera server by inserting IP address




Not secure | 192.168.43.225

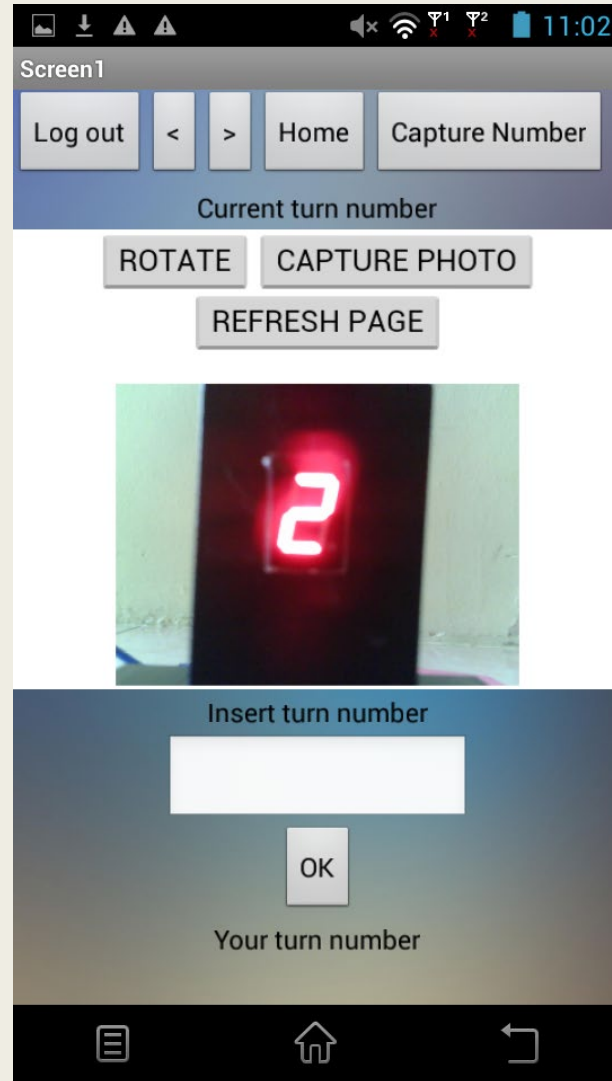
ESP32-CAM Last Photo

It might take more than 5 seconds to capture a photo.

Insert the IP address here



- Also, on the developed application



RECOMMENDATION

- For future works that can improve this project is by adding estimated time to get the service instead of monitoring every changes number
- for software development, the app can be developed and utilize for all type of smartphones especially iPhone

CONCLUSION

- The objectives of the project are to design and develop a mobile queue counter monitoring system has been completed successfully.
- Where the ESP32 Camera can capture images and
- The captured images can be observed on the developed apps

VIDEO PRESENTATION

Please refer to the link below for a video of the product.

We made this video for an innovation competition AINEX2020:

<https://drive.google.com/file/d/1jp2iUfq0SSwj2qcuNgNrFV0hDtZ7chBC/view?usp=sharing>



THE END

THANK YOU