



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF SMART VENDING MACHINE BY USING
IOT TECHNOLOGY**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Automation and Robotics) with Honours.

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Automation and Robotics) with Honors. The member of the supervisory is as follow:


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ABSTRAK

Disebabkan keadaan pandemik COVID-19, kebanyakan orang telah lebih berjaga-jaga terhadap kebersihan tangan dan biasanya akan menghindari dari menyentuh sesuatu yang tidak perlu ketika berada di tempat umum. Oleh itu, mesin layan diri pintar berkemampuan IoT telah menjadi inovasi yang selamat dan evolusi untuk perniagaan dalam suasana 'norma baharu' ini. Mesin layan diri yang mesra pengguna ini amat sesuai dengan keadaan pandemik kerana ia merangkumi ciri-ciri seperti sistem pesanan dan pembayaran tanpa sentuhan. Selain itu, mesin ini juga dilengkapi dengan sistem pengesanan stok yang sentiasa dikemas kini pemiliknya. Komponen utama projek ini merangkumi papan Arduino Mega 2560 Rev 3, papan Arduino UNO, Modul Wi-Fi ESP01 (Wireless Fidelity), modul SX1278 RF LoRa, modul RC522 RFID, putaran berterusan 360 darjah servo motor, motor stepper NEMA 17, pemacu motor stepper A4988, modul sensor sentuh kapasitif TTP223, modul Infrared objek detector sensor dan modul paparan LCD1602. Pelanggan hanya perlu menggunakan aplikasi Blynk pada telefon yang mempunyai akses internet untuk mengawal mesin dalam keadaan masa nyata. Komoditi yang dipilih kemudian akan ditukar menjadi isyarat dan dihantar menggunakan isyarat tanpa wayar ke Arduino Mega untuk mengaktifkan proses penghantaran. Analisis prestasi kerja mesin layan diri akan dilakukan. Selain itu, penilaian terhadap sambungan IoT menggunakan teknologi RFID, LoRa dan Wi-Fi juga akan dilakukan.

ABSTRACT

Due to the coronavirus pandemic, people have become hypervigilant of hand hygiene and would normally avoid touching things unnecessarily in public. Hence, IoT-enabled smart vending machine had become a safe and evolutionary innovation developed for businesses to cope with the 'new normal.' This user-friendly vending machine is best-suited the pandemic world as it includes features such as end-to-end touchless checkout and contactless payment system. Besides, this machine also comes with a real-time stock tracking system which constantly keeps the owner updated. The main components of this project include Arduino Mega 2560 Rev 3 board, Arduino UNO board, ESP01 Wi-Fi (Wireless Fidelity) module, SX1278 LoRa RF module, RC522 RFID module, 360-degree continuous rotation servo motors, stepper motors NEMA 17, A4988 stepper motor driver, TTP223 touch sensor module, infrared proximity sensor and 16x2 Character LCD1602 display module. Customers can simply use Blynk application on their phone with internet access to control the machine in real time. The chosen commodity will then be converted to signal and wirelessly transmitted to Arduino Mega microcontroller to activate the delivery process. Analysis of the working performance of vending machine will be done, as well as the IoT evaluation of the vending machine which includes RFID, LoRa and Wi-Fi technologies.

DEDICATION

Dedicated to my beloved parents Mr. Ng Boon Huat and Mrs. Tai Wee Fun, who have respected and supported me in everything I do.

Dedicated to madam Saleha binti Mohammad Saleh, who taught and guided me throughout the journey of completing the final year project.



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