

ITEX'23

34TH INTERNATIONAL INVENTION, INNOVATION &
TECHNOLOGY EXHIBITION, MALAYSIA

CONCURRENT EXHIBITION:

WYIE WORLD YOUNG
INVENTORS EXHIBITION

INCORPORATING:

AYIE ASIAN YOUNG
INVENTORS EXHIBITION

MYIE MALAYSIAN YOUNG
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Revolutionize Fire Safety: A Mobile App for Fire Extinguisher Management

Product Background

The Fire Extinguisher Management System (FEMS) is a mobile application that allows users to manage fire extinguishers. It provides a platform for contractors to register their fire extinguishers and for authority bodies to inspect them. The app uses NFC and QR code technology to track and record the status of fire extinguishers.

Novelty/Originality/Inventiveness

- There is no mobile app application using NFC, RFID and OCR scanner to scan the serial number and automatically the data will be recorded in the system.
- Contractor only needs to bring a hand phone at the site and start the inspection using the OCR scanner (since currently serial number is only available in QR format).
- One step ahead, we developed another two technologies which are NFC and RFID to adapt with technology changes and using the RFID tag, it can scan more than one fire extinguisher. This can speed up the data recording process.

Benefits/Usefulness/Applicability

- Solve the problem of missing fire extinguisher information which is important especially during the auditing process.
- Speed up the process of applying serial number between on-site sectors and administration.
- Citizens can check the status of the fire extinguisher and the name of the contractor if they see the condition of the fire extinguishers are not well maintained.
- Could help authority body to identify the contractors that do not well manage the condition of fire extinguisher.
- Can avoid any fire incident if all of us aware about.

Marketability & Commercialisation

- There are more than 2 millions fire extinguisher units throughout Malaysia and need to be serviced and recorded once a year.
- This app will ease not only vendor but to authority body which is Bomba and public to know the status of the fire extinguisher around them in just ONE SCAN.
- With the introduction of RFID and NFC technology, fire extinguisher can be managed more effectively.
- Potential Social/Community Benefit - Fire Contractors, Bomba, Public.

Publication
IOT: Mobile Application for Managing Fire Extinguisher
Status: Under Review
www.ump.edu.my

Cost Analysis

- Alto Firework is the target for this with a fee of RM 6000.
- There is no similar mobile app for managing the fire extinguisher in the market and it is FREE.

Product Image and Product Characteristics

Award
Gold Award - ITEX 2023

Collaboration Partner
IAITO Mahiran Digital

Status of Innovation

Pre-Commercial Period
1. Total there are about 1.5 million fire extinguisher in Malaysia.
2. The product number is 2.5 and 3.5 million.
3. The authority body need to inspect the fire extinguisher at least once a year.
4. The fire extinguisher need to be replaced after 5 years.
5. The fire extinguisher need to be checked after 2 years.
6. The fire extinguisher need to be checked after 1 year.

ITEX 23 GOLD AWARD

Ts. Dr. Wan Isni Sofiah develops mobile application to streamline fire extinguisher maintenance

27 December 2023

PEKAN, 11 December 2023 – While fire extinguishers are well-maintained, the absence of digitized records poses challenges for fire safety contractors in efficiently storing and accessing records. This challenge inspired Ts. Dr. Wan Isni Sofiah Wan Din, a researcher and lecturer at the Faculty of Computing (FK), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), to create a Fire Extinguisher Management System (FEMS) mobile application.

AITO Firework Holding Sdn. Bhd., a leader in the fire safety industry in Malaysia, collaborated on this research initiative. The application's development received assistance from Mohd Mohsin Ismail, a Bachelor of Computer Software Engineering student from FK.

Ts. Dr. Wan Isni Sofiah explained that traditional manual maintenance, relying on paper notes, posed risks of loss or damage, and the potential loss of records when personnel changed.

"Each fire extinguisher cylinder has a lifespan of ten years and requires annual maintenance. Neglecting maintenance could result in faulty extinguishers, posing risks to users. Previously, contractors had to bring forms to the site for maintenance or replacement," she said.

With the introduction of technology, the FEMS mobile application enables contractors and customers to scan fire extinguishers with their smartphones, providing real-time status updates based on fire department specifications.

"The research, initiated in 2019 with website development, continued until 2021. After assessing the stability and customer usage of the FEMS website (fems.my), we introduced the mobile application (mobile apps) FEMS in 2021, available on Google Store and App Store platforms. Continuous improvements have been made to meet customer needs," she added.

The idea originated when the Managing Director of AITO Firework Holding Sdn. Bhd. shared challenges faced by administrative staff waiting for technical employees to return from maintenance sites to hand over fire extinguisher records. The FEMS mobile application simplified data recording, enabling technical workers to record data directly and administrative staff to apply for efies sticker labels promptly.

The FEMS mobile application, utilizing Near Field Communication (NFC), Optical Character Recognition (OCR) scanners, Quick Response (QR) codes, and Radio Frequency Identification (RFID) technology, offers a comprehensive solution for fire extinguisher equipment management.

NFC facilitates communication between the mobile application and the NFC chip inside the fire extinguisher, providing accurate tracking of each extinguisher's location, status, and maintenance history. OCR scanner technology reads Malaysian Fire Department efies sticker labels, simplifying data entry and reducing errors.

QR codes provide quick access to fire extinguisher information, including type, location, and maintenance history. RFID tags track extinguisher movement within facilities, offering real-time information for efficient retrieval during emergencies.

AITO Fireworks Holding Sdn. Bhd. fully funded the development of the FEMS website and mobile application. UMPSA Research Grant (UIC220837 and RDU220204) funded participation in competitions and exhibitions.

Ts. Dr. Wan Isni Sofiah aims to digitize the Malaysian Fire Safety industry, with over two million fire extinguishers nationwide requiring maintenance and recording. The FEMS mobile application aims to simplify contractors' tasks and keep customers informed about the condition of their extinguishers.

The application is currently available for free on Google Store and App Store platforms. Training fees for contractors to use the application are RM500/person.



Ts. Dr. Wan Isni Sofiah plans to promote the application further and provide training to increase awareness among fire safety contractors in Malaysia. The team hopes the FEMS mobile application will become a catalyst in speeding up the maintenance process and recording of fire extinguishers.

He mentioned plans to penetrate the Indonesian market, with a need for further study to align the application with market requirements.

The FEMS mobile application earned recognition, winning a silver medal at the Creation, Innovation, Technology, and Research Exposition (CITREX) 2022 Competition and a gold medal at CITREX 2023. Additionally, it received a gold medal at the International Invention, Innovation, and Technology Exhibition (ITEX) 2023 held at the Kuala Lumpur Convention Center on 11th to 12th May 2023.

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TAGS / KEYWORDS

[CITREX UMPSA](#)

[Faculty of Computing](#)

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