

MELAKA
INTERNATIONAL
INTELLECTUAL EXPOSITION

MIIEX'24

12 JUNE '24

Dewan Taming Sari,
Universiti Teknologi MARA Caw. Melaka,
Kampus Alor Gajah, Melaka

*"Empowerment of Special
Needs through Invention
& Innovation"*

**EXTENDED
ABSTRACT**

MiiEX'2024

MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND
INNOVATION”**

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UiTM Cawangan Melaka

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78000 Alor Gajah

Melaka Bandaraya Bersejarah

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MiiEX'2024

MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024

“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND
INNOVATION”

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INNOVATION, INVENTION, AND DESIGN

FOREWORD BY THE RECTOR OF UiTM CAWANGAN MELAKA



Professor Ts. Dr. Mohd Rasdi bin Zaidi

Rector, Universiti Teknologi MARA (UiTM)

Cawangan Melaka

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honour for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

2024 is a special year where MIIEX 2024 emphasizes the development of special needs. As we know, special needs indicate a limitation in a person's ability to engage in and benefit from various aspects, such as daily activities and education. Hence, with the theme "Empowering Special Needs Through Invention and Innovation," it is a platform for industries, professionals, academicians, students, and communities to share their innovative ideas and products to increase accessibility for those with special needs.

The successful implementation of MIIEX '24 is our joint success. This event was supported by the Melaka state government through YB Datuk Fairul Nizam bin Roslan, the EXCO of Science, Technology, Innovation, and Digital Communication. I also want to express my

gratitude to Universitas Negeri Padang, Indonesia, Universitas Muhammadiyah, Makassar, Indonesia, the International Association of Economic and Businesses (IAEB), Universiti Sains Islam Malaysia, Ibnu Umami Maktum Research Center (UMMI), USIM, and The Southeast Asia Minister of Education Organization Regional Centre for Special Educational Needs (SEAMEO SEN) as our co-collaborators for MIIEX 2024.

The collaboration from various parties in MIIEX '24 is a platform that will improve cooperation and interweaving among industries, professionals, academicians, students, and communities in shaping their potential in developing innovation products. This exposition also serves as a platform to cultivate and uphold the nation's innovation culture by presenting new ideas and research by young people, especially from academia and universities. Indirectly, MIIEX '24 will encourage all inventors towards empowering Science, Technology, Engineering, and Mathematics (STEM), especially in primary and secondary schools.

The new digital landscape also inspires more innovation and new ideas that contribute to various activities, such as business and industries. As a university that encourages "Research and Innovation," we aim to foster more innovative products that benefit scholars, industries, and communities, addressing issues to improve our present and future life.

This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

FOREWORD BY THE DEPUTY RECTOR (RESEARCH & INDUSTRIAL LINKAGES)



Associate Professor. Dr. Nur Hayati binti Abd Rahman

Deputy Rector (Research & Industrial Linkages), Universiti Teknologi MARA (UiTM) Cawangan Melaka

With much passion and privilege, let me warmly welcome all of you to the Melaka International Innovation Exhibition (MIIEX), UiTM Cawangan Melaka's flagship event. I firmly believe that events such as these demonstrate the gradual evolution of this platform in terms of its significance and its governing principles within the sphere of learning and the broader scholarly society.

The theme for this year, "Empowering Special Needs Through Invention and Innovation," strongly connects to our mission of using research and technology to make a positive impact on the world we live in. Besides enforcing the message of diversity, this theme also reaffirms our focus on creating products to improve the lives of people with disabilities (PWDs). Such innovations are vital as only through focused constructive changes can society become more sensitive to the needs of all members.

MIIEX allows researchers, students, and industry professionals to come together, share their innovative research, and develop viable research partnerships. It has been great to see the enthusiasm of the participants and the efforts they put into their projects, which can offer various social and economic benefits. This is why one can state that MIIEX is a great

opportunity for creating connections between the academic environment and industry, facilitating the implementation of innovative and promising projects.

Finally, I would like to express my sincere appreciation to all the members and supporters of the organizing committee, all the participants, sponsors, and everyone involved in preparing this event. I want to express my gratitude for your commitment and involvement, as the success of MIIEX and the development of an active culture of innovation in our university and beyond is partly owed to your support.

Thank you

FOREWORD BY THE PROJECT DIRECTOR



Dr Zulkefli bin Muhamad Hanapiyah

Senior Lecturer

Assalamualaikum and Warmest Greetings,

It gives me a great pleasure, on behalf of the organizing committee, to welcome all participants and speakers to the Melaka International Intellectual Exposition 2024 (MIIEX '24) with the theme "Empowering Special Needs Through Invention and Innovation." We are honoured and pleased to welcome all participants to this biennial event.

MIIEX '24 is a platform that gathers experts from local and international industries, academia, scientists, researchers, and the community to contribute to the advancement of scientific and technological knowledge. This knowledge helps develop disruptive innovation products that improve daily activities for businesses and the community, especially those with special needs.

MIIEX '24 provides an atmosphere for inventors of all levels to gain new exposure and collaborate. Indirectly, this promotes a collaborative and innovative culture that focuses on cutting-edge technologies and new standards in technology and creativity.

MIIEX '24 is anticipated to serve as an arena for participants to acquire and disseminate revolutionary information on ideas and innovation. It is intended that the competition will expose the contestants' minds to the latest technologies and designs, aligning with the government's goal of encouraging innovation in Malaysia.

Finally, I want to compliment my fellow committee members on their amazing efforts, which were vital to the event's success. In addition, I want to thank our co-organizers, event sponsors, and participants. Optimistically, we hope that all new knowledge discovered, invented, or innovated will lead us toward future sustainability.

Thank you.

**FOREWORD BY MELAKA STATE EXCO OF SCIENCE, TECHNOLOGY,
INNOVATION AND DIGITAL COMMUNICATIONS**



YB Datuk Fairul Nizam bin Roslan

Melaka State Exco of Science, Technology, Innovation and Digital Communications

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honor for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

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Thank you.

MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	DR NORASHIKIN ADAM
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	AFZAN SAHILLA BINTI MOHD AMIR HAMZAH
	MUHAMMAD FURQAN BIN AZHAR
	KHAIRUL AZHAR BIN LOCHMAN

ABOUT MIIEX'24

MIIEX'24 is an innovation competition annually organised by UiTM Melaka with the intention to bring together ideas and inspiration that could fit in for commercialization needs.

This event creates a platform for researchers to establish networking, partnership and opportunities to collaborate with industries.

OBJECTIVES

1. Encourage and instil passion towards inventing and innovating among UiTM Cawangan Melaka staff, students and academicians of local and international higher education institutions;
2. Highlight distinguished talents of skilful inventors and exhibit intellectual products, inventions and innovations among local and private tertiary institutions, government and private agencies, including international participants;
3. Become an effective Business Matching platform for participating research products, matching industries and partnering government agencies;
4. Recognise, inspire and promote invention and innovation products to be patented and commercialized;
5. Increase passion towards inventing and innovating through research and boost interests of government and non-government agencies to obtain consultancy services from a line up experts of higher education institutions and UiTM Cawangan Melaka.

THEME

'EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND INNOVATION'

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Smart Pill Box Organizer

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Abstract

The elderly are the group that usually takes multiple medication pills at one time. However, the pill box organizers available in the market have various disadvantages and require them to depend on constant help from a caregiver or family member. This is because the different types of dose medication pills and taking a variable dose at one time worsen the situation. Elderly people with blurred vision and inability to read will cause errors in taking medication which will lead to the risk of a more serious medical crisis that may require hospitalization. Therefore, the smart pill box organizer (SMART PBO) has the solution. SMART PBO is equipped with smart device technology. Caregivers only need to enter the required pill information according to the prescribed dose and time of intake in the device. When it's time to take the medicine, the user only needs to click on the device's monitor for the required information, which is the day and session, for example, Monday, morning session. So, the box will automatically open and remove the required dose and type of pill. This product is also equipped with an alarm to remind the user when it is time to take the medicine. This product will provide convenience in the management of medication intake to users to ensure the accuracy of medication intake, dosage, and type of medication. This product is targeted at the elderly on average very synonymous with taking medicine and will ease them in managing it.

1. INTRODUCTION

Medication management among the elderly presents challenges exacerbated by traditional pill organizers' limitations, necessitating reliance on caregivers and risking errors (Kim, 2018). The Smart Pill Box Organizer (SMART PBO) introduces a transformative solution, integrating smart device technology to enhance accuracy and convenience. By offering customizable medication schedules and dosages, intuitive user interfaces, and automated dispensing, SMART PBO empowers elderly individuals to independently manage their medication intake, mitigating risks and improving overall quality of life. This extended abstract explores SMART PBO's design, functionality, and potential impact, highlighting its role in revolutionizing medication

management practices and promoting greater independence and well-being for the elderly population.

2. OBJECTIVES

The smart pill box organizer (SMART PBO) aims to develop a smart pill box organizer that enhances medication adherence and patient safety by providing smart device technology, real-time reminders, the accuracy of medication intake, dosage, and type of medication. Next, SMART PBO aims to assist elderly population or special needs individuals, who often take multiple medications and may struggle with managing their medication regimen independently, by using smart device technology to automatically dispense the correct dose and type of medication at the prescribed time, reducing the likelihood of errors in medication intake. Furthermore, SMART PBO will be develop a user-friendly device that allows caregivers to input medication information easily, allow them to track medication adherence, and receive alerts for missed doses or medication errors.

3. NOVELTY & INVENTIVENESS

SMART PBO's unique features and functionality are changing the dynamics when it comes to medication management solutions for the elderly population. The SMART PBO provides a full and easy solution, in contrast to traditional pill organizers that are not flexible enough to meet the requirements of elderly people.

4. PRACTICALITY & USEFULNESS

a. Easy to use

Smart PBO is specifically designed to simplify medication management for users. With its user-friendly interface, users can easily input medication information, dosage, and timing into the application, accessible via the mini tablet attached to the lid. This information can also be monitored by other devices for added convenience. Retrieving medication information is as simple as interacting with the device's monitor. The portable design of Smart PBO, coupled with it is Type C charging capability, ensures easy transportation and versatile usage, whether at home or on the go. It is lightweight and

durable components guarantee long-term usability, making it an ideal solution for elderly individuals with mobility issues.

b. Automatic Dispensing

With Smart PBO, there is no need for manual sorting or complex dosage schedules. Users can easily customize their medication schedule directly on the box, tailoring it to their individual needs. When it is time for medication, the required dosage and pill type are automatically dispensed, eliminating the risk of errors due to disorientation or blurred vision. This automated function ensures safer medication management, giving users peace of mind and promoting independence in their daily routine.

c. Companion Application

Users can easily access the Smart PBO application by scanning the QR Code located on the back of the box. The application can be downloaded onto any smart device or accessed directly on the mini tablet attached to the pill box. Once in the app, users can take advantage of a variety of features to simplify medication management. They can set up an alarm system to remind them to take their medication on time, store personal notes related to their healthcare, and keep important medical history files provided by their doctor. Additionally, the app allows for remote monitoring across multiple devices. For instance, when the alarm goes off, all connected devices receive a notification, and the Smart PBO emits a sound. If the user misses the alarm, caregivers can receive a notification and make urgent calls to remind the user to take their medication, ensuring timely and accurate intake. Additionally, Smart PBO allows users to share their health data with healthcare providers effortlessly. Through the companion app, users can exchange vital health information, facilitating better communication and personalized care. This seamless exchange of data ensures that healthcare providers have access to up-to-date information about the user's medication adherence and overall health, enabling them to provide more effective and tailored medical assistance. In addition, this app is designed to be user-friendly for individuals with visual impairments, making it accessible to blind users as well.

5. CONCLUSION

In conclusion, the Smart Pill Box Organizer (SMART PBO) represents a significant advancement in medication management solutions for the elderly population. By harnessing smart device technology, SMART PBO addresses the limitations of traditional pill organizers and empowers users to independently manage their medication intake with ease and accuracy. The device's user-friendly interface, automatic dispensing capabilities, and companion application offer a comprehensive solution that enhances medication adherence, reduces the risk of errors, and promotes greater independence and well-being for elderly individuals and those with special needs. With its practicality, usefulness, and innovative features, SMART PBO revolutionizes medication management practices, ensuring safer and more efficient healthcare delivery for this vulnerable demographic.

6. REFERENCES

Luke D. Kim, M. F. (2018). Medication management in older adults. *Cleveland Clinic Journal of Medicine* February 2018, 85 (2), 129-135.

7. APPENDICES



Figure 7.1 Examples of Pill Box models