

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

KM26 Jalan Lendu,

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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## **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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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.

## MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	RIDZUAN ADLI BIN AZIDIN
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	PN AFZAN NOR BINTI TALIB
	PN NUR HIDAYAH ZAINI
	CIK FARIHA AIZA BINTI RAMLY
	PN NURUL AIN BINTI MUSTAKIM
	PN NOORZALYLA MOKHTAR
	PN ZATUL HIMMAH BINTI ABDUL KARIM
	CIK MUNA KAMEELAH BINTI SAUID
	PN NOR MASLIA RASLI SAMUDIN
	PN NURHAFIZAH MOHD ZOLKAPLI
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	SITI NURSYAHIRA ZAINUDIN
	BUSHRA ABDUL HALIM
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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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<b>SALACHOLESTA (OBAT HERBAL KOLESTROL DARI KULIT SALAK) SEBAGAI UPAYA MENINGKATKAN KESEHATAN DAN PEREKONOMIAN DI KOTA PADANGSIDIMPUAN</b>	<b>1429</b>

## **iFrost Smart Refrigerator**

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### **Abstract**

Refrigerator is one of the valuable household appliances to keep foods and drinks cool by pushing a liquid refrigerant through a sealed system which causes it to vaporize and draw heat out of the fridge. Additionally, refrigerators are also useful home appliances that help the disabled people to store their medicines at cold temperature to avoid any exposure, however it also has its own challenges like smells, narrow spaces and does not have any advanced technology. iFrost Smart Refrigerator is a new refrigerator where consumers can gain the benefit from iFrost home application with the aim to enhance the advance of the technology that can help the households and disability people at the same time. iFrost smart refrigerator uses LCD display with IOS system, ice cream maker with any functions machines, also provides a built-in internal camera that connected with iFrost home application also has a sensor to neutralize and identify the foul gasses. Moreover, iFrost smart refrigerator also provides smart child lock to prevent any accidents since the iFrost smart refrigerator has focused to disabled people for instance the household with autistic children and cognitive disabilities. iFrost home application is a user-friendly application that helps consumers to control iFrost smart refrigerator remotely from their smartphone at home which can help the consumer to adjust the temperature of their iFrost smart refrigerator through the applications which as per the reported inconsistent temperature is one of the common problems (Morin, 2024). This iFrost smart refrigerator has a high potential in the market because of its integration with smart home ecosystems and also the market growth and adoption to

technology. The result of iFrost smart refrigerator in home appliances could be more beneficial among the seniors and disabled people because it can provide an increase of independent feeling, safety, and convenience of ease all around.

Keywords: iFrost, Refrigerator, Smart, People, Application

## **1. INTRODUCTION**

Refrigerator is an essential to every household because of its function to protect foods. This is due to the cold temperature that helps foods to stay fresh longer and protect the foods from mold and bacteria. Smart refrigerators were invented in the early 2000s, however smart refrigerators in the market nowadays are lacking in terms of smells, narrow spaces and advanced technology which are not disabled friendly. According to the statistics from Jabatan Kebajikan Masyarakat Malaysia, there are a huge number of households in Malaysia which around 7.91 million while 1.9% is a person are categorized as disabled. As far as we are aware, the smart refrigerators that are currently on the market lack features that are specifically designed to accommodate people with disabilities, such raising the door handle and controls to the perfect height for a wheelchair user. Moreover, hand-free control and mental health assessment are essential components of smart homes for individuals with physical disabilities considering their ability to make wise decisions to avoid putting themselves in danger that could happen in their home (Asaad Kh. Ibrahim et al., 2022). In addition, smart refrigerators that are currently in the market commonly use android software as their main operating system for a product with a built-in display. IOS is generally considered to be a more promising operating system than other operating systems (Sheikh et al., 2013).

## **2. OBJECTIVE**

The iFrost smart refrigerator with advanced technology aims to make daily life more convenient and enjoyable to both general users and individuals with disabilities. The iFrost smart refrigerator makes daily life more convenient and enjoyable by allowing users to easily monitor and control the refrigerator through a mobile application. This

includes features like voice control, smart temperature settings, built-in camera, child lock like, touch screen display, ice and ice cream maker and smell sensor. Next, the iFrost smart refrigerator also aims to prioritize the health and well-being of its user by preventing the consumption of spoiled or expired food with a smell sensor feature. This template provides a simplified and understandable process of how the iFrost smart refrigerator works.

### 3. NOVELTY & INVENTIVENESS

The iFrost smart refrigerator is designed specifically to meet the needs of disabled individuals. It features a smell sensor detector to detect and neutralize odors. Besides, it comes with a user-friendly **built-in button ice cream maker** which provides a variety of options that users can choose either they want to make smoothie bowls, gelato, milkshakes, lite ice cream, sorbet, and mix-ins. Additionally, with a **built-in 10.9” apple display**, allows users to stream music from platforms like Spotify or search for recipes on YouTube. Also, there is a **smart child lock** to prevent accidents and keep young children safe. Plus, a **voice control** that allows users to use voice commands. Moreover, it has a **built-in camera**, which enables users to monitor their refrigerator remotely. Lastly, iFrost built a **push-button** door mechanism that allows wheelchair users to easily open and close refrigerator doors. With all these advanced features, iFrost provides home appliances easy to use and accessible, leading the market growth and paving the way for widespread adoption of advanced technology.

### 4. PRACTICALITY & USEFULNESS

The iFrost smart refrigerator was created with the requirements of disabled people, featuring a size ideal for wheelchair users for easier access. Following this, the most standout feature is its **smell sensor detector** explicitly towards sensitive users. It utilizes advanced gas sensor technology like metal oxide sensors, specifically tin dioxide (SnO<sub>2</sub>) to neutralize bad odors (Berna, 2010). Next, iFrost provides an **ice cream maker** with **built-in buttons** that are at an ideal height for wheelchair users that allows for easy use and compatibility. The **built-in 10.9” apple displays** allow disabled people access to online content like music and recipes from the kitchen, making their daily lives better and more fun. Additionally, a **push button** handle door allows

wheelchair users to open and close the appliance without physical strain. Moreover, it provides **voice control**, allowing disabled people to easily adjust refrigerator temperatures using simple voice commands or using the iFrost home application. In addition, the **smart child lock** feature can be particularly beneficial for individuals with cognitive disabilities or conditions like Autism and ADHD, where unintended appliance use could be dangerous. Lastly, a **built-in camera** can help people with disabilities easier monitor and control without having to physically access it.

## 5. CONCLUSION

To conclude, iFrost Smart Refrigerator has high potential in the market nowadays due to its advanced technology that can make disabled people's life easier because of potential features to facilitate independence, safety, and convenience in handling food and home necessities, a smart refrigerator that is accessible to people with disabilities can greatly enhance their quality of life. It is clear to mention that the target market for this product is specifically for disabled community including the non-disabled people.

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