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VIRTUAL-MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION

ROAD TO COMMERCIALISATION

V-MIEX BOOK



V - MIIEX BOOK

'ROAD TO COMMERCIALISATION'

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FOREWORD

ASSOC. PROF TS. DR MOHD RASDI ZAINI
Rector
Universiti Teknologi MARA (UiTM) Cawangan Melaka



Welcome to Virtual-Melaka International Intellectual Exposition 2022 (V-MIIEEX 2022). It is an honour for me on behalf of UiTM Melaka Branch to thank all of you for joining the programme and we are proud to inform you that this is the 12th year consecutively, UiTM Melaka Branch is organizing this exposition.

V-MIIEEX 2022 is a platform to improve the commercialization collaboration among industries and communities and at the same time, we also give the opportunity to academicians and students to share ideas and increase their potential innovation products with the industries and communities through their projects. This exposition also serves as a platform to cultivate and upload the nation's innovation culture by presenting new ideas and research by young people, especially from academia, universities, college, high schools, and primary school students.

The economy and development of the country faced a challenging phase in 2021 due to the Covid-19 pandemic. We faced changes in business, education, society, and lifestyle. However, the pandemic proved to be a blessing in disguise as it somehow gave people ideas which would be beneficial to improve their lifestyle and solve problems that might occur in the future. Besides, 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 the "Research, Innovation and Commercialization", this exhibition is organized to encourage more commercialization of products that are beneficial to scholars, industries, and communities to tackle such issues to improve our present and future life.

Since 2009, UiTM Melaka Branch has successfully become the organizer for this innovation exposition. We are not only successful in organizing the exposition, but I would proudly say that we have also successfully embarked on commercialized products. With the number of participants for this year's exhibition, we believe that more commercialized products will be produced in line with the theme for this year, "Road to Commercialisation".

This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams as 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



DR. NUR HAYATI BINTI ABD RAHMAN
Deputy Rector Research & Industrial Linkages
Universiti Teknologi MARA (UiTM) Cawangan Melaka

It is a great pleasure to welcome all the participants and presenters to the Virtual Melaka International Intellectual Exposition (VMIIEX 22). I am delighted that through this periodic event, we managed to bring together scholars and professionals from various fields to engage through this virtual platform where ideas and breakthrough are discovered and leveraged for commercialization potential.

Since 2009 UiTM Cawangan Melaka has held twelve Invention and Innovation Design competitions and this year we are very honoured to have the second year of VMIIEX organized in digital platform. This has proven that despite the global challenges due to the recent pandemic, it is never an issue for UiTM Melaka to continuously organize this yearly prestigious event and to support the ministry's aspiration in leveraging creativity and innovation in the new norm.

VMIIEX 22 is organized with no sole objectives of accomplishing the University's KPI but instead we are determined to make this programme as the place to help heighten commercialization collaboration in research and innovation with the industry and community through joint exhibitions from various external organizations.

Our aspiration is to also provide exposure and opportunities to academic staff as well as students from public and private universities to engage in direct excellent scholarly activities with the industry and community through activities that can be measured and assessed. As for the Research and Industrial Linkages Office of UiTM Melaka, this exhibition is seen as the platform that can encourage active collaboration and knowledge transfer with industries; objectively to support various activities that will benefit all stakeholders from the various government agencies, local and international universities, industries and communities.

Through the theme of "Road to Commercialization" this year, V-MIIEX 22 is committed to have this event as a boulevard to inspire and cultivate creativity and innovation to the numerous levels of inventors through exposure on latest technologies, astonishing ideas and creative designs with great potential to be commercialized. For this year, we proudly introduce a special category which is the "Endemic Challenge" as the provision to the government of Malaysia's goal of moving towards the endemic.

To ensure that the competing products in this exhibition is not exclusively for the purpose of competition, V-MIIEX 22 is dedicated for the commercialization of highly potential innovation products, which is attained through its active collaboration with tailored needs industries. The commercialization effort was not for income generation purpose only but it aimed to spearhead the development of quality products in line with industrial needs and community benefit.

Therefore, it is a great honour for me on behalf of the Research and Industrial Linkages Office as well as the organizing committee to have all participants in this competition and I would like to express my highest gratitude especially to the Rector of UiTM Melaka and all strategic partners and sponsors for supporting the event.

To finish, I sincerely wish VMIIEX 22 a remarkable success. I believe that this will not be the only collaboration between UiTM Melaka and the respective partners and linkages, but a beginning of a long and fruitful cooperation in future.

Thank you very much.

road to commercialisation...

WAN HASMAT WAN HASAN
Project Director V-MIIEEX 2022
Universiti Teknologi MARA (UiTM) Cawangan Melaka



Assalamualaikum and Warmest Greetings.

It gives me an enormous pleasure, on behalf of the organizing committee to welcome all participants and presenters to the Virtual -Melaka International Intellectual Exposition 2022 (VMIIEX '22) with the theme "Road to Commercialisation". We are honoured and glad to welcome all participants to this biennial event.

This is the second time that we have organized this biennial event virtually. V-MIIEEX 22 is an innovation competition, in which, innovation products, ideas and systems related to various science and technological fields are exhibited as a solution for the presented problems.

V-MIIEEX22 expectantly will be a platform that gathers experts from academies, scientists, and researchers, locally and internationally, to contribute towards the growth of scientific and technological knowledge in each participant's specialisation and expertise.

The competition also serves as a platform to give fresh exposure to the various level of inventors, as well as to encourage the culture of innovation design focused on latest technologies and related to new norms technologies and inventions due to COVID-19.

V-MIIEEX 22 is also hoped to be an avenue for gathering and disseminating the latest knowledge on ideas and acquisition of innovation among the participants. It is hoped that the competition will be able to open the mind of the participants towards latest technologies and design. It is also in line with the government's aspiration to encourage innovation activities in Malaysia.

As a final note, I would like to congratulate my fellow committee members for their tremendous effort, which have been critical to the event's success. In addition, I would like to thank our co-organizer, event sponsors and supporters. Optimistically, we wish that all new knowledge that is discovered, invented, or innovated will drive towards our future sustainability.

Thank you.

ABOUT V-MIIEEX

The world after COVID-19 is unlikely to return to the world that was. Despite the challenging pace during the pandemic, the strong rebound is expecting in this exciting year 2022. Malaysia is welcoming the great prospects ahead with positive impact on the country's economy and development. Hence, the hope for greater opportunities motivates for more creative thinkers to come up with innovative ideas that can be put forward to be harnessed to overcome similar problems in the future. V-MIIEEx 2022 is one of these platforms which contribute relevant ideas that could help communities of all walks of life cope with this pandemic.

UiTM has identified research, innovation, and commercialization to be among the core components and strategic effort towards becoming a well-known and prominent university. Aside from realizing this goal, with these components and efforts, fostering the development of knowledge, generating financial stability of the university, and producing knowledgeable academicians are also potentially achievable.

By having invention and innovation competition yearly, UiTM Cawangan Melaka is confident that it could further enhance creative and innovative abilities among staff and students. In support of the government notion which upholds the importance of innovation, UiTM Cawangan Melaka has taken the initiative of organising the Virtual Melaka International Intellectual Exposition (V-MIIEEx).

In instigating and nurturing the continuous culture of inventing and innovating, this event is an ideal platform for lecturers, administrative staff, students, and the public to showcase and commercialize their products or prototypes as well as novel ideas. The first IID which was held nationally in UiTM Cawangan Melaka in 2009, has successfully gathered and displayed more than 37 inventions and innovations. Accordingly, to continue this strong passion towards inventing and innovating, the IID competition should be continued and celebrated.

With that, the Division of Research and Industrial Linkages will be organising its 12th IID competition, the Virtual - Melaka International Intellectual Exposition (V-MIIEEx 2022) with the theme, 'Road To Commercialisation'. V-MIIEEx 2022 hopes to welcome 200 competing products to be showcased and commercialized, at the same time, attract attention of related and matching industry.

Objectives

1. Encourage and instill 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 skillful 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.

Intelligent Parcel Dropbox

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Abstract

In response to the COVID-19 pandemic, several restrictions and standard operating procedures (SOPs) have been enforced during the MCO, such as the economic and social activities restriction, compulsory mask-wearing, and social distancing. These restrictions and SOPs has pushed many activities previously undertaken offline to the online realm. This includes shifting from in-person shopping to ordering goods and services online, leading to a remarkable increase in e-commerce orders for this year. Therefore the Intelligent Parcel DropBox is developed to allow better MCO SOPs compliance and reduce the probability of virus transmission during the delivery process as well as to increase the efficiency of delivery process among courier staff. This DropBox is designed using CAD Modelling software, and the functionality of the control system is demonstrated using Proteus Design Suite software. It features a motor-controlled roller shutter door to maximize space usage and a pump-controlled disinfection antiseptic spray to sanitize the received goods. The user interface control system is manifested in two ways; a user-friendly physical interface (at the DropBox) and an Internet of Things (IoT) based virtual interface (at the mobile phone). The physical interface allows a delivery person to interact with DropBox during the delivery process physically. While the latest cutting-edge IoT technology enables remote control using a virtual interface, even the user is far away. The findings of this study will be marked as a significance endeavor for the advancement of how technology is changing the delivery industry and along with, it will largely contribute to the continuous improvement in parcel delivery method. Delivery flexibility with automated service-one that takes a package right to a customer's front door in a way that's entirely safe from infections, accurate tracking and economical.

Keywords: Parcel Sanitization, Courier Delivery Services, CAD Modelling Software, Internet of Things (IOT)

1. INTRODUCTION

The increase of popularity of e-commerce during this pandemic covid-19 crisis results in a steadily increasing number of packages sent. This fact represents a huge potential for the sector of logistics and courier services. Currently, the shipping sector faces the problem where recipients do not have time to take delivery by courier or postman, so shipments remain stored at the post office or other contact delivery points. Collection of the parcel/product also becomes difficult and there are many people suffering from coronavirus. Recent studies indicate that the virus can be spread by people who are not showing symptoms. It may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes. This is not thought to be the main way the virus spreads, but we are still learning more about this pandemic virus. Sanitization is the most

important way to prevent the spread of infections. Adequate sanitation, together with good hygiene and safe water, are fundamental to good health and to social and economic development. It is technically possible a package or mail coming to the house is contaminated with virus picked up somewhere along the way by people handling or coughing on it. Thus, by replacing the traditional mailbox with a secured smart parcel box, would probably unlock the potential of innovation for delivery services.

The smart parcel mailbox is electronically accessed and controlled by the recipient for any usage they might consider (postal delivery, reverse logistics, delivery from local shops, etc.). While the traditional mailbox is silent the smart postal mailbox communicates information to the recipients (SMS, emails, notifications), provides electronic proof of delivery to posts, or receives information from different providers (e.g., pin code associated with the right to open a specific parcel). The smart parcel mailbox means a system for determining the presence of contents in the mailbox from a remote location regardless of distance, consisting of: a sensor for detecting the presence of content in a mailbox, evaluation of mailbox content, while the sensor is being positioned in the mailbox; a control unit which communicates with mailbox sensor and is used for storing information of the status of the mailbox, while the status is being used for observation of the presence of contents in the mailbox; and remote access device to enable a user to contact mailbox control unit from a remote location in order to obtain the status of the mailbox. There some examples of smart delivery box concept such as secured delivery Box which generates onetime password (OTP) for every active session and notifying the customer about the systematic process flow till the session is terminated. The system performs as a secured box with minimum operational delay.

Another example is using smart system letter box, in which the hardware kit is used to notify user that letter is arrived. The mobile application is used to receive the notification. Here the obstacle sensor is used to detect the object (letter). The RTC clock is used to store the time the delivery of the letter. GSM module is used to send the notification through message and the GPS detects the location at which address the letter has been received. Android operating system used in this system which has lot of features integrated in it. MySQL database is used to store the records. This database is easy to maintained records. Another example of smart delivery system is a courier/parcel collecting box which is to be installed in our home like A/C in a place where the outsiders and insiders can be able to access it for placing and collecting the parcel respectively. It consists of barcode sensor, weight sensor loading cell and doors on both sides of the box for placing and collecting the parcel as when the customer is available. It will also contain a shifting belt where the parcel will be placed initially. After verification of the parcel, it will be shifted inner ward so that the parcel will reside in a place safely until the customer is able to collect it.

2. OBJECTIVE

1. To redesign and fabricate the Parcel Delivery System's hardware based on ergonomic design aspect assessment.
2. To determine and integrate the system's IoT design framework into the Parcel Delivery System.
3. To measure the effectiveness of the delivery process and sanitization process of the Parcel Delivery system.

3. NOVELTY & INVENTIVENESS

This research will significantly help in providing better insight of Domestic Shipping In Malaysia by new technology implemented in Courier service company. Delivery flexibility with automated service-one that takes a package right to a customer's front door in a way that's entirely safe from infections, accurate tracking and economical. The success of the current study will contribute toward the revolutionary Industry 4.0 (4.0IR) which is align to Malaysia government agenda to be more competitive, in manufacturing sector by encouraged to adopt and embrace automation and smart manufacturing concepts.

4. PRACTICALITY & USEFULLNESS

This smart parcel delivery drop box consists of hardware and software part. The hardware part consists of 3 main components includes motor-controlled roller shutter door to maximize space usage as well as to secure the safety of received parcel, The sliding platform and sanitize platform to receive, sanitize and keep the parcel safe in the dropbox. While the software part consists of verification process tools (IoT Testing) includes protocol simulators, data recorders, virtualization and building Labs that serve the entire digital portfolio to experiment and simulate real-time experiences. The user interface control system is manifested in two ways; a user-friendly physical interface (at the DropBox or hardware part) and an Internet of Things (IoT) based virtual interface (at the mobile pone or software part). The physical interface allows a delivery person to interact with DropBox during the delivery process physically. While the latest cutting-edge IoT technology enables remote control using a virtual interface using mobile phone, even the user is far away.

5. CONCLUSION

To keep up with the rising consumer demands, the courier industry must continues to develop new strategies and technologies to make operations more efficient, fast, and safe for both couriers and customers. In conclusion, by development of this intelligent parcel dropbox may boost courier services industry performance with practically user interface and user-friendly designed equipped with the latest Industrial Revolution 4.0 (4IR) technology to suit current product application demands. This development also can be used as a benchmark in development of new advanced technology that dealing with latest online shopping product with safety and efficient.