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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.

FIXEL: Roadside Assistance Mobile Application

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Abstract

Many drivers have experienced difficulties in obtaining assistance when their vehicle breaks down on the road. This challenging circumstance is extremely stressful since there are constraints to obtaining assistance, such as the service provider being too far away or the service provider's phone number being unavailable. The difficulty in deciding on a service provider is also due to the desire to meet several criteria, such as the lowest service price and the shortest distance from the service provider. It has become difficult for service providers to attract new customers when they are unfamiliar with the area. Typically, drivers will select the most popular service provider, which may be a long distance away from them. These issues inspired the creation of this initiative, which aims to aid drivers and service providers via a mobile platform. Map navigation, service provider suggestions based on certain criteria, online payment, and direct communication between drivers and service providers are all elements of the app. To improve the quality of choosing the proper service provider based on the criteria involved, such as service availability, costs, distances, and ratings, one of the multi-criteria decision-making methods was utilised. The proposed project's goal is to provide a communication platform for drivers and service providers, as well as a recommendation list of service providers who meet all of the criteria.

Keywords: Mobile application, TOPSIS, MCDM, PWA, ODS and VRSP

1. INTRODUCTION

Mobile devices, such as smartphones, notebook computers and tablets, have touched our everyday lives in a variety of ways, including social networking, online purchasing, information searching, Geographic Positioning System (GPS) navigation, and much more. Mobile application development trends have been influenced by technological advancements, customer needs, and a range of other variables [1]. The on-demand services (ODS) domain, which encompasses transportation, healthcare, and delivery services, has been found and demanded to be developed as the availability of mobile devices grows rapidly [2]. This leads to a scenario in which emergency services are provided on the road. Roadside assistance is a type of protection when your vehicle stalls while out and about. In the event of a roadside emergency, mobile devices are commonly utilised to request professional assistance to fix or tow the automóviles [3]. The lack of any nearby vehicle repair service provider (VRSP) and the unknown stranded area add to the driver's frustration. Furthermore, the problem of multiple goals will always remain within businesses since it makes decision-making more difficult [4]. For example, each VRSP may differ in terms of location, price, and performance. Thus, it tend to complicate the decision-making process because the driver will choose the option manually.

2. OBJECTIVE

With the use of a proper application that can provide answers for numerous problems that arise in automobiles, the burden of experiencing vehicle breakdowns can be reduced. For the issues of complicated decision-making, the Multi-Criteria Decision Making (MCDM) approach will be utilized to balance the criteria and generate a VRSP that is appropriate for the drivers. MCDM is an operations research technique that compares numerous competing solutions and increases the solution's reliability and credibility [5]. Implementation of the MCDM approaches can help people figure out which option is best for them.

3. NOVELTY & INVENTIVENESS

According to market review, numerous apps with nearly identical concepts exist, including Carput, Serv, and Carpit. None of them, however, used the TOPSIS method. Several characteristics, such as distance, time, price, and rating, can be considered in suggesting the VRSP using the TOPSIS approach for the proposed project, which will improve the quality of making the right decision and raise the likelihood of the local VRSP gaining more customers. TOPSIS was invented in 1981, and it is still used in industries like marketing management and chemical engineering [6]. This method compares the performance of each alternative based on their shortest and farthest distances from the best and worst ideal answer, often known as the compromise solution. This strategy has the advantage of requiring only a few inputs from the decision-maker and producing a basic and easy-to-understand output. The drawback is that vector normalisation is required to address multi-dimensional problems.

4. PRACTICALITY & USEFULLNESS

The proposed mobile apps will save time and money for both those seeking assistance and those providing repair services during car breakdowns. Users can choose from a list of VRSP and submit requests for the services they want right away. In terms of VRSPs, any of them can be added to the application. The price of the services will be changeable because it is determined by the VRSP. Progressive web application (PWA) are chosen in this study since they can be accessed using a browser and are compatible with a wide range of operating systems (OS). Furthermore, PWA offers a significant advantage over native and web mobile applications [7]. In this study, users are divided into three categories: member, mechanic, and administrator. The members have the option to login account, register account, manage vehicle, request service, view request and manage profile. As for the mechanics, they can log in account, register account, view request, manage profile, manage workshop and view workshop's statistic. The admin can login account, view overall statistic, view user's profile and view activity log.

5. CONCLUSION

This study focused on using the mobile platform to assist drivers and service providers. The app's features include map navigation, service provider referrals based on certain criteria, online payment, and direct communication between drivers and service providers. One of the multi-criteria decision-making techniques was utilised to increase the quality of selecting the appropriate service provider depending on the factors involved, such as service availability, costs, distances, and ratings. The study's future enhancement recommendation is to give users the option of sorting the VRSP recommendation list by specific parameters, such as price. VRSP's current recommendations are solely based on the TOPSIS algorithm. The basic sorting

options should make skimming through the VRSP recommendation list more enjoyable for the user. In the future, the research could include a push notification feature to make the app more like a real mobile app.

6. REFERENCES

- [1] M. Nagappan and E. Shihab, "Future Trends in Software Engineering Research for Mobile Apps," in *IEEE 23rd International Conference on Software Analysis, Evolution, and Reengineering*, 2016, pp. 21–32.
- [2] P. Y. H. Sia, Y. H. P. Iskandar, and A. Yusuf, "Factors influencing the usage of mobile apps for travel among generation-Y in Malaysia," in *IEEE Conference on e-Learning, e-Management and e-Services, IC3e*, 2018, pp. 55–60.
- [3] K. Haridas, A. S. Baharudin, and K. Karkonasasi, "Automotive Servicing and Breakdown Assistance System (ASBAS): Impact of Perceived Ease of Use (PEOU) and Vehicle Breakdown Servicing Necessity (VBSN) on Vendor's Intention to Adopt ASBAS," *Indian J. Sci. Technol.*, vol. 9, no. 48, 2016.
- [4] T. D. C. Frazão, D. G. G. Camilo, E. L. S. Cabral, and R. P. Souza, "Multicriteria decision analysis (MCDA) in health care: A systematic review of the main characteristics and methodological steps," *BMC Med. Inform. Decis. Mak.*, vol. 18, no. 1, pp. 1–16, 2018.
- [5] P. K. Parida, "A General View of TOPSIS Method Involving Multi-Attribute Decision Making Problems," *Int. J. Innov. Technol. Explor. Eng.*, vol. 9, no. 2, pp. 3205–3214, 2019.
- [6] R. Rahim *et al.*, "TOPSIS Method Application for Decision Support System in Internal Control for Selecting Best Employees," *J. Phys. Conf. Ser.*, vol. 1028, no. 1, 2018.
- [7] K. Behl and G. Raj, "Architectural Pattern of Progressive Web and Background Synchronization," in *Proceedings on 2018 International Conference on Advances in Computing and Communication Engineering, ICACCE 2018*, 2018, no. June, pp. 366–371.