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**V-MIEX**

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VIRTUAL-MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION

ROAD TO COMMERCIALISATION

**V-MIEX BOOK**



# V - MIIEX BOOK

## 'ROAD TO COMMERCIALISATION'

#### EDITORS AND COMPILERS:

Dr. Nur Hayati Abd Rahman  
Dr Syukri Abdullah  
Wan Hasmat Wan Hasan  
Aini Qamariah Mohd Yusof  
Norazlan Anual  
Dr. Khairunnisa Abd Samad  
Nordianah Jusoh @ Hussain  
Rozana Othman  
Norlela Abas  
Azira Rahim

#### COVER DESIGN:

Adi Hakim Talib

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Division of Research and Industrial Linkages  
UiTM Cawangan Melaka  
KM26 Jalan Lendu,  
78000 Alor Gajah, Melaka  
Tel: +606-5582094 / +0606-5582190 / +606-5582113  
Email: [miixuitm@gmail.com](mailto:miixuitm@gmail.com)  
Website: <https://www.miiex.my/>  
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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.



**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.

# AN INTELLIGENT MCDM PERFORMANCE MEASUREMENT FOR MARITIME LOGISTICS (IMPerMaL)

Muhamad Safuan Shamshol Bahri<sup>1</sup>, S.Sarifah Radiah Shariff<sup>2\*</sup>, Nazry Yahya<sup>3</sup>

<sup>1,2</sup>, Malaysia Institute of Transport (MITRANS), Universiti Teknologi MARA Shah Alam, Selangor Malaysia

<sup>3</sup> Johor Port Skills, Johor Port Berhad, Johor Bharu, Malaysia

shari990@uitm.edu.my\*, msafuansham@gmail.com

## Abstract

One of the enormous challenges faced by the maritime logistics industry in Malaysia is related to the development of capability of personnel, in terms of manpower and expertise. Therefore, it is of utmost important to evaluate the criteria needed for personnel in maritime logistics industry and how it varies across the different levels and different countries especially in southeast Asia. As the maritime logistics industry has become a critical component in the commercial link, the need for performed talents and manpower to support the industry is a competitive advantage to the nation. The first step is identifying the criteria that can be used in evaluating the performance of port personnel. Next step is to calculate the criteria weights using the Analytical Hierarchical Process (AHP) method; by using AHP template in Microsoft Excel by Goepel (2018). The criteria weights are used in determining the performance of the port personnel and its rank. All criteria are accepted and approved by the experts and results show consistent performance with the actual performance at the selected ports within ASEAN. material. An Intelligent Multi Criteria Decision Making (MCDM) Performance Measurement For Maritime Logistics (IMPerMaL) is developed to be able to provide a system that captures the best talent in maritime logistics and be able to help the relevant organisations namely port industry to hire and maintain its best personnel not only in Malaysia but neighbouring countries.

Keywords: Port Personnel, MCDM, AHP, Performance Measure

## 1. INTRODUCTION

The need for talents and manpower to support the industry grows as marine logistics industry grows globally. Some are focusing on producing talents who are innovative and creative in coping up with technological advances and be able to innovate break through, however, the main concern would be whether we know the traits in the right individuals as the manpower or talents for the industry. In Malaysia, in order to remain competitive, all industry players need to act fast in line with the development of technology produced through Industry 4.0, hence among the steps that can be taken is by strengthening the education system based on the field of maritime technology. The government is seen to be aware of the challenges that exist in the industry, yet the real function of the established National Shipping and Port Council (NSPC) need to be addressed especially in ensuring the continuity of talents produced for the industry (AbdHamid, 2020). In Malaysia also, the employment market is rigid in nature, where people who have been in an industry for years accumulating specific knowledge and skills are at a loss when they are retrenched because all that hard-earned knowledge is not suitable for other

industries (Benjamin, 2019; Cicek et al., 2019). In order to determine the performance evaluation framework for the personnel, the study uses AHP method to calculate the weightage of the criteria where the highest weightage is for Work Attitude (0.560) followed by Job Performance (0.298) and Work Ability (0.120) (Bahri et al, 2021).

## **2. OBJECTIVE**

The main objective for the development of this project is on evaluating the performance of the port personnel using identified criteria and establishing an intelligent performance measurement using multi-criteria decision method (MCDM). One of the enormous challenges faced by the maritime logistics industry in Malaysia is related to the development of capability of personnel, in terms of manpower and expertise. Therefore, it is of utmost important to evaluate the criteria needed for personnel in maritime logistics industry and how it varies across the different levels and different countries especially in southeast Asia. As the maritime logistics industry has become a critical component in the commercial link, the need for performed talents and manpower to support the industry is a competitive advantage to the nation.

## **3. NOVELTY & INVENTIVENESS**

An Intelligent Multi Criteria Decision Making (MCDM) Performance Measurement For Maritime Logistics (IMPerMaL) is developed to be able to provide a system that captures the best talent in maritime logistics and be able to help the relevant organisations namely port industry to hire and maintain its best personnel not only in Malaysia but neighbouring countries. The measurement is calculated in form of Excel framework (Goepel, 2018) that is convenient for all organisations without any need for extra cost of purchasing additional software.

## **4. PRACTICALITY & USEFULNESS**

IMPerMal is a performance measurement framework that can be used by marine related organisations especially port in evaluating their personnels that is based on many criterio. This framework is equipped with several relevant criteria with calculated weightage confirmed by the experts from local ports and neighbouring countries. This means that the framework can be applicable to many.

## **5. CONCLUSION**

Personnel performance appraisal systems are widely regarded as critical in businesses and they are used for a variety of purposes including pay raises, improvement and training, transfer, compensations, counselling, promotion, employee recognition, and termination. These are all acceptable reasons for firms to use an intelligent systematic performance appraisal system. a variety of purposes including pay raises, improvement and training, transfer, compensations, counselling, promotion, employee recognition, and termination. These are all acceptable reasons for firms to use an intelligent systematic performance appraisal system.



## **6. AKCNOWLEDGEMENT**

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## **REFERENCES**

- AbdHamid, A.S (2020). Plug the gaps to make Malaysia a maritime nation, FEBRUARY 24, 2020, Available at: <https://www.theborneopost.com/2020/02/24/plug-the-gaps-to-make-malaysia-a-maritime-nation/>
- Bahri, M. S. S., Shariff, S. S. R., Zolkefley, N. S. I., & Yahya, N. (2021). A tri-level AHP approach for port logistics personnel performance evaluation. In 11th Annual International Conference on Industrial Engineering and Operations Management, IEOM 2021 (pp. 2209-2220).
- Benjamin, R. (2019), Mismatch of skills and jobs, Tuesday, 09 Apr 2019. Available at: <https://www.thestar.com.my/opinion/letters/2019/04/09/mismatch-of-skills-and-jobs>
- Cicek, K., Akyuz, E., & Celik, M. (2019). Future skills requirements analysis in maritime industry. *Procedia Computer Science*, 158, 270-274.
- Goepel, K. D. (2018). AHP excel template with multiple inputs. Business Performance Management Singapore (BPMSG): Singapore