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ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research and Innovation) with aims to highlight a research and innovation on multidisciplinary expert of fields in UiTM. It serves as a platform for researcher to showcase their high quality and impactful findings, activities and innovative solution through publication. Contribution of these ideas come from academicians, researchers, graduates and universities professionals who will enhance the visibility of research and stride to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that is accepted by all expertise.

ABOUT UiTM

Universiti Teknologi MARA (UiTM) is a public university based primarily in Shah Alam, Malaysia. It has grown into the largest institution of higher education in Malaysia as measured by physical infrastructure, faculty and staff, and student enrollment. UiTM is the largest public university in Malaysia with numerous campuses throughout all 13 states in Malaysia. There is a mixture of research, coursework and programmes offered to the students. Office of the Deputy Vice-Chancellor (Research and Innovation) or known as TNCPI (*Timbalan Naib Canselor (Penyelidikan dan Inovasi)*) serves as a *Pusat Tanggungjawab* (PTJ) navigate the research and innovation of university in achieving UiTM agenda. TNCPI office strives to mobilize faculty, and campuses to move together and cooperation of researchers to become a leading global university of science, technology, and innovation by 2025.

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FOREWORD

Bismillahirrahmanirrahim.

Alhamdulillah, all praises to Allah SWT and a heartfelt congratulations to the Office of Deputy Vice-Chancellor (Research and Innovation) on the publication of RISE Magazine (October Issue, No. 2) in promoting visibility for UiTM's research and its researchers.

I am thrilled to have witnessed a growing number of article publications and research innovations endeavoured by our fellow researchers. Thank you for all the effort, time, and energy that you have selflessly spent for the university.

The sustainability theme chosen for this edition is wise, apt, and timely. While striving to become a Globally Renowned University (GRU) and attaining Sustainable Development Goals (SDGs), we must ensure that our research activities are in line with the 17 goals set by the United Nations (UN) as well as the university's strategic plan.

UiTM is proud with the progressive development of renewable energy and currently 7 campuses are equipped with solar photovoltaic rooftops. This supports Malaysia's noble cause of becoming a carbon-neutral nation by 2050. Green Retrofit Framework for Sustainable Residential Refurbishment Project was also initiated with

plausible effectiveness to increase the number of green buildings and eventually will help reduce the emission of Green House Gases (GHG).

Our researchers have also begun to use Green Polysaccharides material for wound healing which is greener and environmentally benign. Other noteworthy projects are the use of Resistograph to assess the accuracy of Wood Density (WD) prediction, the application of 3D printing technology in simulating real experiences of halal animal slaughtering, as well as lipid reduction via systematic screening to make our planet more sustainable.

I am delighted with the research ambience that has now become an acceptable culture in UiTM. GRU2025 is definitely achievable with continuous effort and dedication made by members of UiTM as we work towards helping the nation and the world to achieving SDGs by 2030.

Thank you.

PROFESSOR DATUK TS. DR HAJAH ROZIAH MOHD JANOR

Vice-Chancellor

Universiti Teknologi MARA



FOREWORD

Congratulations to the editorial team on the publication of RISE magazine Issue 2, 2022, serving as a platform to showcase our pride in UiTM research and innovations.

We chose *Sustainability* as the theme for this edition. Despite its definition that may be contextual and vary across the field, we can't deny its essence and impacts on our daily life, and that every one of us should gracefully embrace.

Under this umbrella, we have witnessed an array of projects carried out by UiTM researches in various genres of research, driven to help the community in the short and long run. Flipping each page of this magazine and seeing how far we have become as a university sends unflagging goosebumps- signaling how proud I am to be part of this huge family.

Research has no longer been alien to us. We could see that the propagated activities in the quest of finding answers to problems have mushroomed over the years. It has become somewhat the bread and butter of academics other than teaching and learning. Its role has been significantly proven to elevate teaching community to a better level.

TNCPI Office seeks continuous support from every researcher, academician, and administrator to keep your momentum in doing research and innovations. Perhaps, through a stronger research ecosystem, this will help us to become a Globally Renowned University by 2025. We will keep providing supports, rewards and facilities needed in boosting the morale of our researchers.

Lastly, I hope RISE can be the front page of UiTM exhibiting the business that we are doing. Every time you go for a conference or any meeting with potential collaborators, please share RISE with them. We never know how much opportunities that will come knocking our doors just from that gesture.

Thank You.

PROFESSOR TS. DR NORAZAH ABD RAHMAN

Deputy Vice-Chancellor (Research & Innovation)
Universiti Teknologi MARA

MESSAGE FROM THE CHIEF EDITOR

Alhamdulillah

It gives me great pleasure to see RISE issue # II published. We have received a huge number of impactful submissions to be featured as our #KeluargaUiTM's research stories. Despite the difficult circumstances of post-covid19, UiTM researchers are proactive in carrying out research activities and events within their respective capacities.

Allow me to express my heartfelt gratitude to all of the authors of the articles in this magazine. Not to forget all editorial members who worked hard to ensure its publication was on schedule. The publication of this issue would have been far more difficult to achieve without their contributions. In this edition, we feature seven researchers from both science and technology and social sciences disciplines with their views and experiences in sustainability-related research and their efforts for mobilising sustainable development. Also, RISE II presents the achievements of the multidisciplinary domains by distinguished UiTM research groups.



I believe that sustainability should be the nucleus of any research agenda. Prominent researchers around the world are focusing on the call to address global livelihood and wellbeing. Hence, we at UiTM should embed and embrace the principles of Sustainable Development Goals in our research efforts.

To all researchers out there, we hope that the amazing stories in RISE II will rekindle our enthusiasm for research. We sincerely hope to bring you more research news from the #keluargaUiTM in the coming issues. I invite you to discover RISE II and be inspired. Enjoy reading!

ASSOC. PROF. DR MOHD MUZAMIR MAHAT

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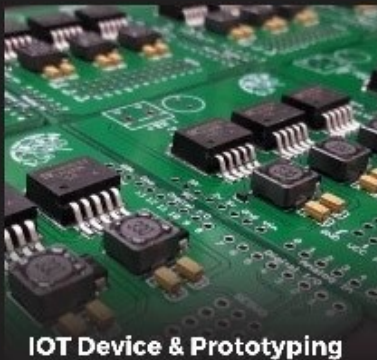
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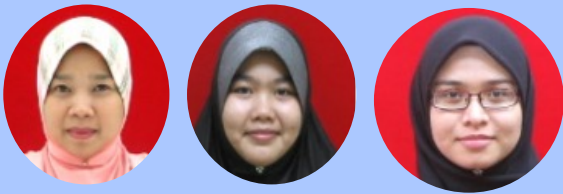
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Achieving Business Sustainability through Green Innovation



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The term “sustainable development” began to gain wide acceptance in the late 1980s. According to Organisation for Economic Co-operation and Development (OECD), the economic growth alone was acknowledged as insufficient to solve the world’s problems; the economic, social and environmental aspects of any action are essentially interrelated. The growing concern for the depletion of natural resources and environmental degradation around the globe, has significantly increased the pressure on businesses to achieve sustainable development. Thus, why is sustainability in business important? Businesses cannot operate independently of nature because they require resources to produce necessary materials and services (Ullah, Khan, & Ahmad, 2022). Hence, sustainable development is an increasingly popular approach aiming at achieving long-term global well-being, by sound economic and natural resource management, as well as through respect for people and other living things (Blackburn, 2007).

Given that Malaysia is a popular emerging market, it is timely to explore the current implementation of the sustainability agenda of green business in the country. Environmental issues have been frequently reported in the local news in recent years. As a result, various measures have been introduced by the government to protect the environment and at the same time to promote sustainable development. The challenge in balancing economic progress with environmental conservation will continue to be met.



In general, the focus of environmental awareness among the community and business sectors has also been encouraging.

Sustainability can be achieved by adopting business strategies and activities that meet the current demands of the enterprise and the stakeholders, while safeguarding, sustaining, and developing the human and natural resources required in the future (Labuschagne, Brent, & Van Erck, n.d.). Pursuing sustainable development not only contributes to the solution of social and environmental problems, but also generates higher financial benefits (Elkington, 1999; Porter & van der Linde, 1995). In order to be sustainable, each of these principles must be met; if any of the principles are not met, economic development will not be possible (Bansal, 2005).

Undoubtedly today green economy is a lucrative sector that includes everything from eco-friendly and green lifestyle products, organic food, renewable energy and clean technology, water and waste management, and natural resource (Saxena & Khandelwal, 2012). Therefore, businesses are facing increasing challenges to address sustainability issues to attract, satisfy, and retain customers. The size of green markets is increasing and is likely to get bigger in future (Dangelico & Pujari, 2010). In addition, consumers’ demands for environmentally friendly products are growing (Barber, Kuo, Bishop, & Jr, 2012). Therefore, in order to fulfil the customers’ needs and wants, it is essential to develop effective marketing strategies (Chan, 2013). The changes in consumer preferences has encouraged the diffusion of an increasing number green products in consumer goods market such as energy-efficient light bulbs, recycled paper and biodegradable products (Kaufman, 2014).



The remarkable growth of green industries indicated the positive attention from the business entities. Various types of firms switched to adopt green practices such as traditional manufacturing companies, and become more profitable after the transform to green manufacturing system (Taylor, Chuang, & Yang, 2013). The retail outlet is also promoting the company's green image (Yusof, Musa, & Rahman, 2012). The agriculture industries also responds in producing foods without harming the environment and consumers' health (Pellegrini & Farinello, 2009). The hotel and tourism industries are also involved in changing their businesses towards green hotel and promotes the eco-tourism (Graci & Dodds, 2008; Punitha & Rasdi, 2013; Chan, 2013). For instance, the brand The Body Shop was considered successful once it integrated environmental management as part of their strategic planning process and applied the green concepts into their routine activities. The Body Shop holds five core values in their business to reduce the business impact on the environment by reducing the energy consumed and generating less waste.

A modern concept of sustainability development incorporates green practices which highlights the needs for firms to focus on adopting green management strategies and capitalize on modern technology to develop environmental friendly products and services (Elkington, 2017). As a result, business operations require green management to make it practical. Consequently, several new green concepts of business administration, such as green production, green marketing, green accounting, green design, and green innovation are developed to help

companies to successfully adopt the environmental management (Chang & Chen, 2013). Green innovation has emerged as one of the key theme for achieving sustainability. This is because it reflects the efforts to reduce the negative environmental effects of production and operations, with a greater emphasis on improving processes, technologies, systems, products, and management methods (Chen, Yi, Zhang, & Li, 2018).

So, what does green innovation mean? Green innovation literature has evolved and expanded concurrent to the increasing awareness level towards environmental protection. Green innovation is the creation of new ideas, goods, services, processes, or management systems that can be used to address environmental issues (Li et al., 2017). Specifically, there are three dimensions related to the concept of green innovation, which are process, product, and organization innovation (Abbas & Sağsan, 2019). For example, the aim for green process innovation is to bring improvements in production process through which raw materials is converted into useable products (Albort-Morant, Leal-Millán, & Cepeda-Carrión, 2016) whereas green product innovations focuses on modifying existing products design or develop new products which are renewable or non-toxic material in the production process so that not only energy efficiency can be achieved, but disposal impact on the environment can also be reduced (Zhang, Rong, & Ji, 2019).

Notably, study by (Zhang et al., 2019) indicate that the subsequent performance of companies can be enhanced through green innovation (i.e., higher sales growth and higher net profits). Numerous other studies also revealed that organizations with green innovativeness have been shown to be more successful (Albort-Morant, Henseler, Leal-Millán, & Cepeda-Carrión, 2017) and perform better in overall compared to their competitors, because they leverage their green resources and capabilities to respond quickly and appropriately to customers' needs and add intangible values and assets to the organization (Singh, Giudice, Chierici, & Graziano, 2020).

As a summary, effective development of green innovation is actually helping the companies to increase their performance. Ar (2012) concluded that all technologies and innovation which have developed a new product or services that provide positive environmental benefits is the key factor to sustainability for businesses. It can be concluded that green innovation has become one of the important strategic tools to obtain sustainability in business operations.





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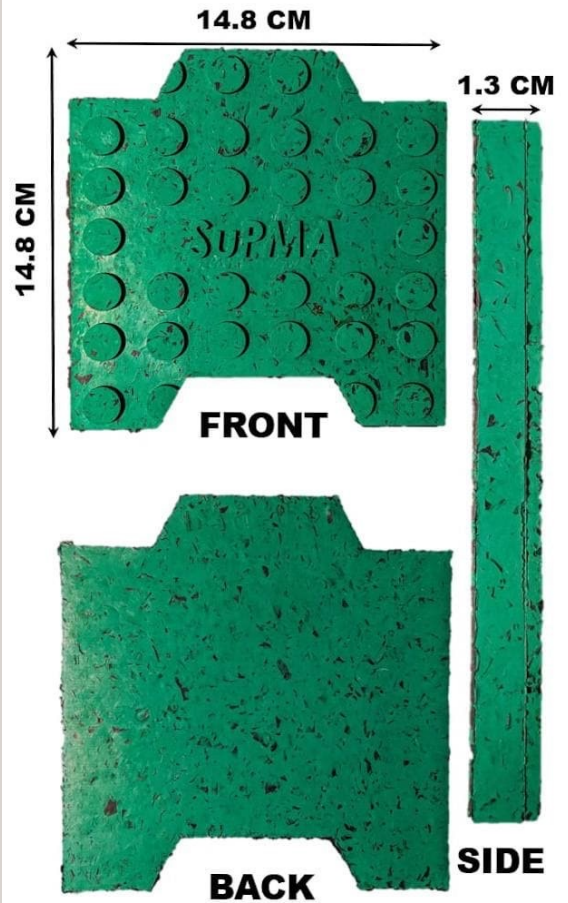
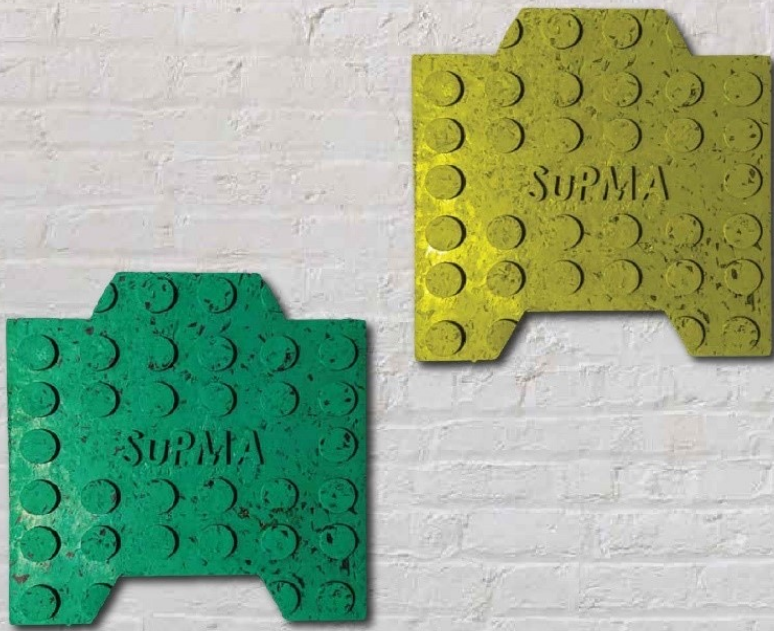
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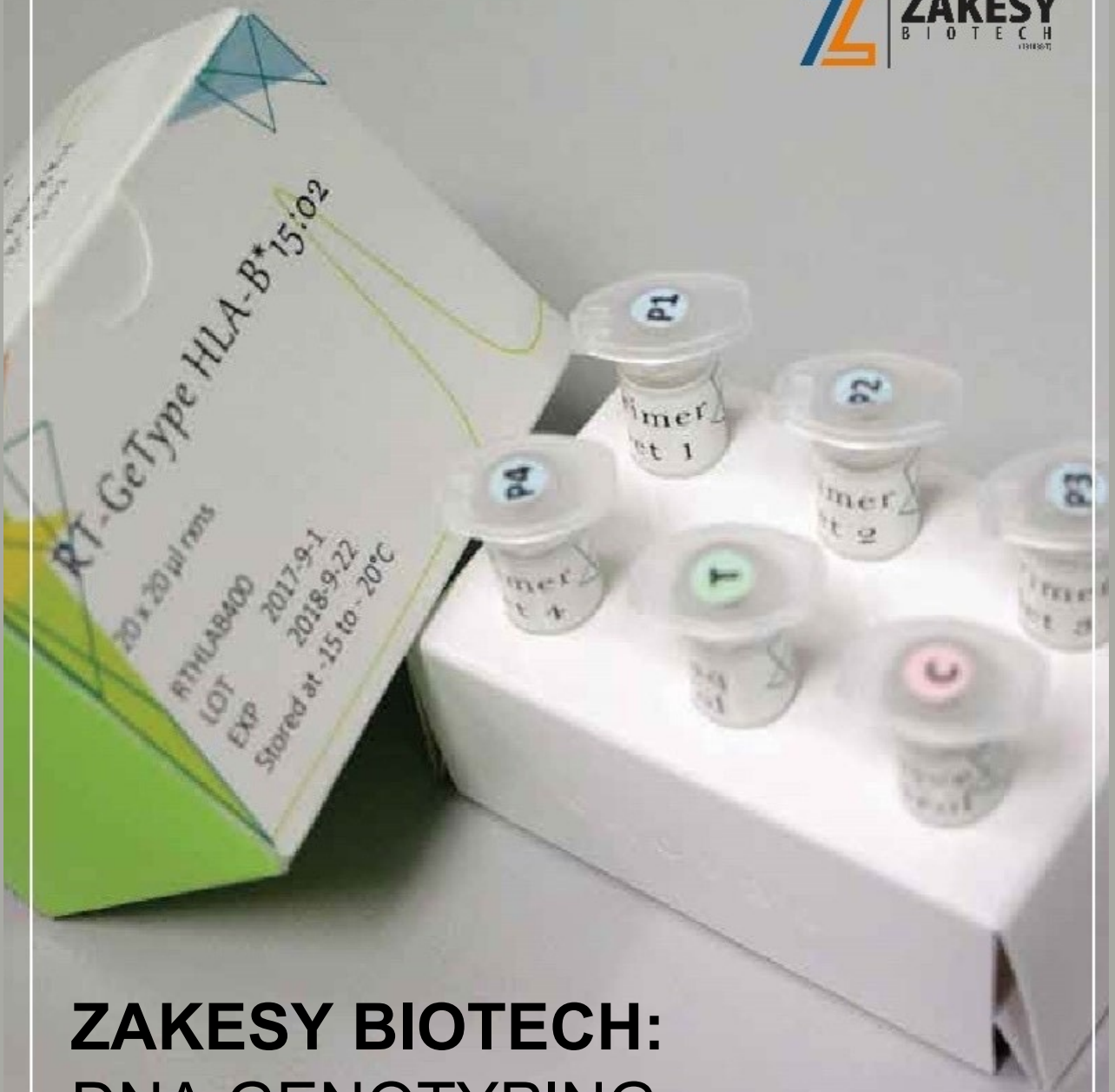
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