

Digital Transformation of MARA University of Technology (UiTM) to the University of the Future and Enhancement of Business Model

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Abstract: This paper explains the digital transformation of MARA University of Technology (UiTM) to become the university of the future. As countries worldwide have become increasingly interconnected due to globalization, universities have likewise undergone significant changes. To achieve and maintain academic and research excellence in today's fast-paced knowledge economy, it is critical for the international universities to transcend traditional education. Several Asian universities have acquired top academic rankings and achieved international recognition in parity with many western iconic counterparts. These rankings have galvanized the world of higher education, resulting in a virtuous circle impact on universities' drive for academic and research excellence. Since the emergence of global ranking, universities have been compared on a national and international basis and this has affected the way they operate. The rankings-used as the tool to maintain and build the institutional position and reputation-have also resulted in an increasing trend of policy makers utilizing the ranking results to decide on resource a location or structure of higher education system counterparts.

Keywords: higher education, digital transformation, university of the future, MOOC, ICAN.

I. INTRODUCTION

The MARA University of Technology (UiTM) is a public university that was published in 1956 as Rural & Industrial Development Authority Training Centre (RIDA). It was inspired by Onn Jaafar, the founder and the former president of United Malays National Organization (UMNO). UiTM started offering postgraduate degree in 1999. Since then the number of post graduate program has increased to 60 where each can be categorized into three nexuses: Science & Technology, Business & Management and Social Sciences & Humanities. There is a mixture of research, course work and mixed mode programs. A total of 2,177 students graduated from both masters and PhD programs in 2013. The increase aligns with the increase in research grants, publication and citations.

The implementation of innovation initiatives at UiTM focuses on 4 main objectives which are to help the nation achieve Vision 2020 that is to become a developed nation by the year 2020. Secondly, UiTM aims to produce novel intentions and innovations that can create value-added products, processes, and activities for the nation to generate greater wealth thus relying less on the labour-intensive driven economy. Thirdly, to educate, prepare and produce highly innovative, qualified and skilled graduates that will fulfil the nation's need for the highly skilled human resource. Lastly, to propel UiTM to a world-class university status by 2020.

II. BACKGROUND

UiTM is now ranked in between 751-800 among the world's elite higher education institution, as twelve of its subject appear in QS World University Ranking 2018 by Subject. The eighth edition of the list by global higher education analyst QS Quacquarelli Symonds shows that UiTM has improved in four subjects, namely Social Sciences and Management (198th from 309th last year), Engineering and Technology (180th from 280th last year), Arts and Humanities (239th from 249th last year) and Life Sciences and Medicine, which has been ranked in the 451-500 range for the first time ever.

Rankings are ever-present in today's world and they are used everywhere. The emergence of university benchmarking has led to a revolution in the way universities or institutions of higher education operate. This of rankings has gained a great importance as a tool for all stakeholders of the higher education landscape. It also can be used as a tool to maintain and build institutional position and reputation, have also resulted in an increasing trend of policy makers utilizing the ranking result to decide on resource allocation or the structure of the higher education system. The rankings are used either as performance indicator or as a tool for choosing places of study. Though concerns about the ranking methodology have been raised, rankings are here to stay and cannot be ignored. If communicated and used correctly, rankings provide useful information and showcase academia in a global society.

UiTM must think of the ways to transform their business model to ensure the benchmarking of UiTM is still aligned with the MEB. There are 5 drives of changer that will transform the higher education sector, which are ease of access to information and knowledge, Industry Revolution 4.0, Integration with industry, global mobility and competitive environment. The global mobility and ease of access to information and knowledge is demanded for now. Based on MEB, they have introduced Globalized Online Learning (GOL). The term globalized, not only refers to the desire for a global target audience, but also the development of e-content that is of international standard. GOL is an important enabler in achieving Malaysia's goal in terms of access, quality and efficiency of higher education. It incorporates blended learning models (where face-to-face classroom instruction is combined with computer-mediated learning) which can enhance the quality of teaching and learning by increasing the degree of interactivity and engagement of students.

According to MEB 2015-2016, they want to build on the vision and aspirations of the MEB to graduate students with the talent, skills, and knowledge needed to thrive in the industrial revolution 4.0. Higher education must prepare students not only for today's demands but also for future challenges. Next, aligning with MEB which is to create a nation of lifelong learners and quality Technical and vocational education and training (TVET) graduates is suitable for the integration with industry. The Ministry aims to be a premier higher education TVET provider that develops skilled talent to meet the growing and changing demands of industry and promotes individual opportunities for career development. The Ministry also aims to expand enrolment over the course of the next decade. The exact nature of the expansion in terms of both quantity of seats and profile of jobs will be determined in close collaboration with industry to ensure supply matches demand.

Lastly for the last driver of changes which is competitive landscape. As we know, governments face very tight budgets, the government has applied five interrelated principles underpin the transformation of the higher education financing system are ensuring the higher education system is affordable, linking funding to performance and outcomes, shifting from supply-side funding to demand-side funding, empowering institutions to become financially flexible and accountable and placing students at the heart of the system.

Thus, all the initiatives made by the government is to ensure all the institution in Malaysia can be operated as usual to develop holistic graduates that can face any challenges in future.

III. PROBLEM STATEMENT

UiTM continues to develop in every aspect especially in the technology context. The changes in technology or in other words known as digital transformation have become one of the aims for the achievements of the university that all education systems want to achieve and even compete in producing the best universities. Above all else, the purpose of universities is to educate students and to prepare them for a lifetime of contribution, leadership, and personal fulfilment. Education of students is a critical element of this strategic plan.

UiTM has succeeded in providing increased access to the number of students in higher education has increased. This paper aims to propose a new planning to transform the UiTM as a university of the future because of the global drivers of change in the higher education sector. Overhauling the existing education system will be crucial to fixing the current societies.

One of the great digital transformation implemented by most of the universities in Malaysia is Massive Open Online Course (MOOC) that are free based online courses that allow a huge number of student participation at one time with the connection of internet. COOC stands for Corporate Open Online Course and is offered for companies. Meanwhile, the Small Private Online Course (SPOC) is for a small number of the group. The evolution of these innovative learning platforms is to harness the power of digital transformation to help construct better education system for the future.

The aiming target for UiTM is to transform the university into digital transformation even though they have to face many challenges. UiTM target want to turn these challenges into opportunity for UiTM stand align with others top university around the world, to make sure the UiTM graduates always relevant according to nowadays demanding, and meeting role mission and vision of UiTM.

IV. PAPER METHODOLOGY

The methodology used is a good-practice framework created by international professional association ISACA for information technology (IT) management and IT governance which is Control Objectives for Information and Related Technologies (COBIT) implementation.

UiTM has developed transformation agenda like Trans4U to maintain sustainable of UiTM. Trans4U is focusing on four (4) components which are Organization (O), Human Capital (M for Manusia) Process (P) and Technology (T), executed via 16 Transformation Programs, encompassing 66 projects. The programmed incorporate all levels of the University's management with the appointment of 7 Taskforce Leaders, 37 Program Directors, 66 Project Managers and 264 team members as the driving force behind the UiTM Transformation Program.

For the future, a new enhancement of business model has been conducted to ensure UiTM has succeeded to a great educational institutional. This enhancement of new business model is needed to transform the UiTM into the University of the future. The first step as to meet the customer needs which is the student, UiTM staffs, and the government. Next, to covering the enterprise end-to-end by implementing all the digital capabilities as stated in Business Model Canvas of UiTM. These capabilities include every sector such as finance, medical etc. Then, applying single integrated framework, for instance, to optimize the cost for the facilities of the student by fining the student for student via penalties system.

Next stage is enabled holistic approach as for student not only focusing on the grade only but creating the student to be useful to the community through experiential learning. Experiential learning is the process of learning through experience and is more specifically defined as "learning through reflection on doing". [1] Lastly, separating governance from management by focusing on return on investment. Notably, Business Model Canvas needs to be changed from time-to-time in following the trend of the current environment. To put it another way, the university does not aim for the monetary return, but they seek greater student learning, higher graduation rates, or increased lifetime earnings and career options.

V. LITERATURE REVIEW

A. Transformation of other world class universities:

In the past decade, the term "world-class university" has become a catch phrase, not simply for improving the quality of learning and research in tertiary education but also, more important, for developing the capacity to compete in the global tertiary education marketplace through the recovery, adaptation, and creation of advanced knowledge.

Nanyang Technological University (NTU) have their own strategy its progress and builds platforms for the creation of greater scientific knowledge and research innovation, which impact on higher education rankings and vice versa. The university has come out with their own strategies which are the NTU 2015 Strategic Plan which consists of governance and management, undergraduate education, and graduate education. Others transformation by this university are research collaboration, faculty appointment, promotion and tenure, Innovation and Enterprise and Campus planning and Infrastructure. NTU has the critical mass to provide the breadth and depth of research and knowledge across a wide spectrum of engineering disciplines. The multi-disciplinary breadth of engineering at the core places NTU in a unique position to exploit the strategic interfaces between these academic fields with engineering as the 'vector discipline'. Within a few decades, NTU has risen to be consistently ranked among the top 100 universities in the world—the elite top 1%. [2]

B. IR 4.0 Digital Technology:

The Fourth Industrial Revolution is distinguishable from the third because it is where *humans meet the cyber world*; where technology and people are not distinct, not separate. We had the PC and we had a life – today our devices and sensors will become an extension of us. Facebook is an extension of us. Our phones are extensions of us. Our smart watches are extensions of who we are and what we do. This fourth revolution has the same triggers as the third revolution, but it's cyber meets human this time. It's the same in businesses. Everything gets integrated, customized and smart-automated. The Industrial Revolution 4.0 automates complex tasks; it's the age of the Internet of Things and Cloud computing. Graduates must be innovative and entrepreneurial and have cognitive flexibility to deal with complexity. Many of them will be co-working not only with Man, but also robots. The need for better communication and collaborative skills will be far more important than ever. Graduates must acquire self-learning skills to remain relevant in the era of rapid changes. Education 4.0 is suggested to affect all the domains (Cognitive, Affective and Psychomotor) in the Bloom's model. In the cognitive domain, Application, Analysis, Evaluating and Creating will become way more important relative to the lower level cognitive skills. IR 4.0 will require human resources with adequate digital and data literacy. Students across disciplines will, therefore, need to gain digital and data literacy during their studies. The convergence of Man and machine in IR 4.0 will mean that the disciplinary distance between science and technology, and humanities and social sciences will be reduced. An important segment of IR 4.0 will perhaps be situated at the intersection of disciplines such as electrical engineering, mechanical engineering, business administration and computer science. Universities in collaboration with industry will therefore need to come up new interdisciplinary programs. [3]

C. MOHE 4.0 /Malaysian Education Blueprint 2015-2025:

The Malaysian higher education system has grown from strength to strength over the past few decades. Over the last ten years alone, the system has made significant gains in student enrolment, risen in global recognition on key dimensions such as research publications, patents, and institutional quality, as well as become a top destination for international students. These achievements are a testament to the drive and innovation of the Malaysian academic community, the support of the private sector, as well as the deep investment the Government has made.

This blueprint elaborates the current situation of Malaysian higher education system and highlight where it will go in the future. It also talks about how it will work in the future and where the changes will take places. To achieve these system and student aspirations, the MEB (HE) outlines 10 Shifts that will spur continued excellence in the higher education system. All 10 Shifts address key performance issues in the system, particularly with regard to quality and efficiency, as well as global trends that are disrupting the higher education landscape.

The MEB (HE) also aims to unleash and empower both private and public HLIs to push the boundaries of innovation and strive for institutional excellence in all its forms. [4]

The Higher Education Ministry and the Malaysia Digital Economy Corporation (MDEC) awarded eight universities with the Premier Digital Tech University (PDTU). UiTM is one of the universities listed in this award. This is one of the steps to produce talents of world-class level within the field. This effort will be continuously improved on by selecting the (suitable) institutions of higher learning and by working with the industry based on demands and requirements. Also benchmarked with other countries to see how they produced digital innovators. [5]

PDTU was introduced by the MOHE as to assign the top institution of higher learnings that can deliver first-class theoretical and practical training. The main purpose is the government want to take a step-in order to produce top talents and future leaders in the digital tech industry. PDTU will transform the student to become Digital Makers that will disrupt all sectors and create new job opportunities. Next, PDTU also aiming for nurturing and grooming talented students to become future digital innovators.

D. UiTM Transformation:

The UiTM Transformation Agenda or Trans4U is developed in order to focus on four (4) components: Organization (O), Human Capital (M for *Manusia*) Process (P) and Technology (T). The UiTM Transformation Program is aligned with the Ten (10) Shifts of Malaysian Education Blueprint 2015 -2025 (Higher Education) to empower superiority and to assure the University's sustainability. The Transformation Program commences with the transformation of the governance

system into 1 UiTM Multisystem governance structure that is featured as one of the eleven (11) priority projects: Quality Lecturers of UiTM (QL-UiTM), Exit Policy, UiTM Endowment Funds, Empowered Professional Programs, Entrepreneurial University Landscape, Creative Media Hub & Technology, 1 UiTM Multisystem governance, Academia Diversity, Anchor Industry, and University Ranking.

“*Menjuruterai Destini, Menjuarai Legasi*” (“Engineering Destiny, Advocating Legacy”) is the tagline for the UiTM Transformation Programme. Engineering Destiny defines UiTM’s commitment in ensuring that wisdom and skills are employed in realising the University’s strategic aims for UiTM to become a world renowned Research-intensive Entrepreneurial University. While the other tagline which is Advocating Legacy denotes UiTM’s aspirations to be the epitome of excellence in spearheading human capital development in all professions and fields of the vast economic landscape and producing generations of movers and shakers in becoming a world-renowned institution of higher learning that is also the pioneer of advanced knowledge championing scholastic achievements. [6]

E. Entrant of new Universities:

Education is evolving. In the future, there will be the new recruitment of the students for the big company like Google that will provide the better products and ideas to drive impact for students and educators.

Google is a company for the search engine. Google has provided various innovative programs and resources to develop skills for the future. [7] They conduct and support research to identify strategies for improving perceptions of learning opportunities in changing the university by digital transformation. The google also has create a new technology that really enables people to do things that otherwise they couldn’t do. For instance, Google Glass display information by working like a smartphone hands-free format.

Alibaba University is one of the successful university that can become the best reference for the UiTM. This university has delivering the latest and most valuable industry insights and developments, macro perspectives and expert opinions. This university aim is to learn from the expert by offer a suite of programs that are practical and skill-based to address the core competencies in managing e-commerce.

F. Drivers of Changers:

- ***COOC***

COOC or Corporate Open Online Course is one of the education program that can be offer by the UiTM. It is can be one of the suggestion to enhance the existing Massive Open Online Course (MOOC) by this university. Based on the research, UiTM has conducted the MOOC that had been involved by 63819 number of students with more than 30 courses offered to them. COOC can be implemented by the UiTM with the suggestion for the UiTM to conduct the academic program for the industry. For instance the program of Bachelor of Information Technology from the UiTM offer to the diploma level staffs of the company like Telekom Malaysia Berhad DBA (TM), National Institute of Public Administration (INTAN), Jabatan Perkhidmatan Awam (JPA) and etc. Certification will be provided by joining these courses.

- ***e-Campus***

The e-Campus or electronic campus that enable the student to enrol in online courses and programs listed by the university. e-Campus is now becoming a trend of the universities because this service focus for the international level whereby the concept can be same as COOC as eCampus focuses its online learning education technology on delivering on-demand preparation for the students to get the certification from the university.

Tshwane University of Technology (TUT) is one of the university in Southern Africa that conducted the e-Campus known as virtual campus. This virtual campus refers to a specific format of distance education and on-line learning in which students, teaching staff and even university administrative and technical staff mainly 'meet' or communicate through technical links. This approach is often described as “ICT supported university” or “digitalization of the university” in university context. [8]

VI. BUSINESS MODEL (BMC)



Figure 1

Based on literature review, the researcher has proposed business model for the transformation of UiTM as a tool to formulate and analyse University of the Future business models and subsequently use the framework to generate enhanced business models for the University of the Future. BMC allows for different approaches of doing business to be modelled in sufficient details enabling us to design and test the business before embarking on it. However, in this paper we have restricted the scope to designing, generating and analysing alternative business model canvas. Testing will be reported in another paper. [9]

The model in Figure 1 represents a range of possible market positions to be pursued by the researcher, rather than representing a model of a single institution. Based on Ernst and young sources, the university should include new target customer such as content consumers, financiers, employers and parents. The university should combine traditional education services with services in related industries such as media and entertainment, financial services and venture capital. Through the services, the university should disaggregate the value chain to create new areas of specialization that can connect with the new transformation. Other than that, outsource student services should use cloud-based customer relationship management tools and techniques for their full suite of back-office functions. [10]

This transformation should have related with the latest blueprint of Malaysian Education Blueprint (Higher Education) 2015-2025 that introduces 10 shifts in support of the five system aspirations that focuses on access, equity, quality, efficiency and unity. For example, UiTM has introduced iCGPA as mechanism of assessment and reporting of students' development and performance. The purpose of this mechanism is to drive development and alignment in curriculum design, delivery and assessment at program level and at course level focusing on student's learning experience towards development of a holistic and balanced human being. This mechanism can be as a surge to achieve the transformation of UiTM to be a university of the future. [11]

VII. GAME CHANGERS

A. Memorandum of Understanding (MoU):

Petronas recently signed a Memorandum of Understanding (MoU) with Universiti Teknologi MARA (UiTM) to further collaborate in the areas of joint research and development (R&D), students' internship as well as adjunct lecturer programs. Supporting the Malaysia Education Blueprint 2015-2025 (Higher Education) and the Ministry of Higher Education's aspiration for more intensive and frequent industry-public university engagement and partnerships, the collaboration also enables Petronas to further strengthen its existing collaboration with UiTM to enhance the capabilities and competencies of selected students. The MoU was signed between Petronas Senior Vice President of Group Human Resource Management, Dato' Raiha Azni Abd Rahman and UiTM Vice Chancellor, Prof. Emeritus Dato' Dr Hassan Said, and witnessed by the Minister of Higher Education, Dato' Seri Idris Jusoh.

Petronas is pleased to strengthen its collaboration with UiTM for the next three years. Through this partnership, UiTM students will be able to obtain first-hand knowledge and experience from proven industry experts in Malaysia. As a national oil and gas company, Petronas is steadfast in empowering the community through initiatives that focus on education, community development and wellbeing, as well as environment. This MoU is another effort to support Petronas' commitment towards the development of market-ready future workforce. Students from five faculties of UiTM namely Accountancy, Law, Communication & Media Studies, Business Management and Information Management will be given exposure via internship placements in Petronas, attaining first-hand knowledge from subject-matter experts as well as gaining experience in or other related industry areas in Petronas. [12]

VIII. SUMMARY & FUTURE WORK

The above modelling exercises showed the creativity and enabling power of BMC in planning and designing business models for the future. The approach permits us to generate options and new future work with ease. We can easily create a new transformation for UiTM resulted from the different driving strategies and starting points.

The researcher will be to gather evidence verifying the business model canvas which would progressively achieve problem-solution for the next step. In this way decision makers for the University of the Future will have a much wider quality options to choose from, allowing them to test ahead before embarking on it. This modelling approach reduces uncertainty and allows them to make an informed decision.

A. Interview:

The researcher has proposed interviewed to Chief Information Officer (CIO) of UiTM to get more exposure and validation on current game changers and key projects in UiTM toward university of future and also, what are the transformation that can be made based on the proposed key projects. The findings from the interview help us more in understanding how transformation can be made.

B. Digital Transformation Plan for UiTM UotF:

• The needs of Industry:

Industry is a sector that need of reliable workforce with up-to-date skills and knowledge to withstand the ever-changing trends of businesses' process. When analysis is being conducted to understand the needs of today's industry, surprisingly, industry and academic leaders revealed that the very skills needed for workforce success are the same skills graduating students lacked — such as analysis and problem solving, collaboration and teamwork, business-context communication, and flexibility, agility, and adaptability (King, 2015).

Through collaborating with industry, they are able to instil the skills needed for their organization into the students' curriculum practices. They can deliver and share knowledge with university's students and at the same time, open a job opportunity to those who performed. In fact, they can evaluate students, first hand, before considering their placement into the organization. Eventually both parties are benefiting from this as the industry able to ease the process of recruitment and the university, able to increase the employability rate of fresh graduates.

Highlighted by American press, Business and postsecondary education have found common cause in recent decades in the preparation of a highly skilled workforce to preserve the nation's competitiveness and economic opportunity in response to rapid technological change and increasing global competition (Soares 2010).

• BYOD in Class:

The main purpose of technology adoption is for amplifying learning process and not to replace the traditional concept altogether. It is not applicable in measuring the level of teamwork, softs skills, and few others of the students' abilities and capabilities. In certain cases, there is still need for physical, face to face interaction in class. Thus, in this case, rather than online learning, technology should be adapted for enhanced learning process in classroom-based education.

For instance, Instructors can directly scribble, writing notes and explanations about the slides presentation at the whiteboards. Consequently, the learning process will become more interesting, effective and save a lot of time.

In this digital age, smartphones have invaded the lesson in class and distract students' focus. Based on the statistic by Tindell and Bohlander (2012), it was found that 95% of students bring their phones to class every day, 92% use their phones to text message during class time, and 10% admit they have texted during an exam on at least one occasion.

Hence, the university can take a brave approach of manipulating this distraction into something beneficial through digital transformation. People are now looking at the new notion of Bring Your Own Devices (BYOD).

The existence of smartphones, tablets and laptop make things become easier for students. It is portable, light, can access internet and provide a lot of useful application. BYOD allow and encourage students to use their own devices for the sake of learning. No more needs of bringing tons of heavy looking reference books to class or going back and forth to the library. Students can now access almost to everything with the help of internet either to e-book, Wikipedia, online journal or article, only at the tips of their finger. More than that, everyone can take quizzes online, conduct research at higher speed and store their massive workload on cloud at real-time. Eventually, this kind of encouragement will instil some discipline on students in regard to their internet consumption habits and help them to utilize their devices in more sophisticated manner.

IX. CONCLUSION

UiTM has sets its university policies independently of ranking metrics. Nonetheless, UiTM's rise in university rankings has provided visibility to the university. As a benchmarking and quality assurance driver, the university has also benefited by ensuring that it obtains good scores in the various categories that are relevant to the progress of a university. When communication and used correctly, rankings provide useful information. Related back to the Business Process Management, the university should be able to create a real value and the process expected to be efficient and effective. The strategy proposed is using the architecture and infrastructure concept. Starting from strategy followed by the architecture and lastly the infrastructure. Planning is one of the essential elements to be done first. Next, drive the architecture by defining the requirements needed. Hopefully, this proposed business case can get the intention of the top management of UiTM to get endorsed by their side.

REFERENCES

- [1] En.wikipedia.org. (2018). Experiential learning. [online] Available at: https://en.wikipedia.org/wiki/Experiential_learning [Accessed 14 Mar. 2018]
- [2] Lim, C., & Boey, F. (2014). Strategies for academic and research excellence for a young university: Perspectives from Singapore. *Ethics in Science and Environmental Politics*, 13(2), 113-123. doi:10.3354/ese00139
- [3] A S Abdul Haseeb (2018 January 10). Higher education in the era of IR 4.0 Retrieved from <https://www.nst.com.my/education/2018/01/323591/higher-education-era-ir-40>
- [4] A S Abdul Haseeb (2018 January 10). Higher education in the era of IR 4.0 Retrieved from <https://www.nst.com.my/education/2018/01/323591/higher-education-era-ir-40>
- [5] Hea.uitm.edu.my. (n.d.). Retrieved March 16, 2018, from https://hea.uitm.edu.my/v1/index.php?option=com_content&view=article&id=246&Itemid=242
- [6] N. (n.d.). TRANS4U. Retrieved from <http://www.uitm.edu.my/index.php/en/about-uitm/others/trans4u>
- [7] Google for Education. (2018). Computer Science programs to support and encourage students | Google for Education. [online] Available at: https://edu.google.com/computer-science/?modal_active=none [Accessed 14 Mar. 2018]
- [8] Virtual campus. (n.d.). Retrieved from http://www.virtualschoolsandcolleges.eu/index.php/Virtual_campus
- [9] Ibrahim, Jamaludin, and Abdul Rahman Ahmad Dahlan. "Designing Business Models Options for "University of the Future"." *2016 4th IEEE International Colloquium on Information Science and Technology (CiSt)*, 2016. doi:10.1109/cist.2016.7804956.
- [10] Ernst & Young, "University of the future", Ernst & Young, 2012.
- [11] Akademik, B. P. (n.d.). Integrated Cumulative Grade Point Average. Retrieved from <https://www.mohe.gov.my/en/initiatives-2/inisiatif-utama/icgpa>
- [12] T. (n.d.). PETRONAS collaborates with UiTM on capability building. Retrieved from https://www.automotiveworld.com/news-__releases/petronas-collaborates-uitm-capability-building/