

Determinant Factors for Commercialising Research Products in Malaysian Public Universities

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Abstract—Commercialisation of the research product has now become a critical issue and has been recognised as a source of wealth creation especially relevant for university in Malaysia. Although many initiatives and efforts have been put forward for commercialisation activities, however the rate of success is still less encouraging. Thus, the purpose of this paper is to review determinant factors for commercialising research products in the Malaysian public universities. For the purpose of the study, interviews were conducted with six academic researchers who have experienced in commercialising their research products successfully. Drawn from their insights and experiences, this study identified the most impactful factors with respect to facilities and supports from the university, competency of the academic researcher, innovative research product and a strong collaboration between university and industry. These factors are important elements for commercialisation of the research products and these factors intertwined with each other. These factors are significant for university, academic researchers and their industry partners to develop and plan strategically for an effective, strategic and sustainable in commercialising research products.

Keywords— Commercialisation; Research Products; Academic Researcher; University and Industry

1. INTRODUCTION

Commercialisation of the research product has now become one of the critical agenda in the university. Commercialisation involves transferring knowledge from the research laboratory into the market place to a new and improved products and services (Isabelle, 2004). Although, traditionally teaching, learning and researching have been the main focus in the university, nevertheless the role and function of the university are gradually changed towards achieving a commercial entity. The emergence of new and improved products from the university have pave the way for university to enjoy a more commercialised status, and some may refer as “entrepreneurial university” (Ramli et al, 2013; Karlsson, 2004; D’Este and Perkmann, 2010). Thus, inevitably, university has to be independent to generate their own income (Ramli et al, 2013; Howitt, 2013; Han & Heshmati, 2013). Academics need to be creative to transform their scientific and technological research in an entrepreneurial way (Phan & Siegel, 2006). The utmost important motivation behind the creation from the university is that it should give impactful benefits to the nation as a whole. However, it is interesting to note that commercialisation of research product is still new in Malaysia, especially in the university. Furthermore, there

are also little findings to support for commercialisation activities. The reason is that that commercialisation involves risky, long and complex processes. Furthermore, since teaching, learning and researching are considered the main mission in the university, commercialisation is treated less important and it is still long way to achieve commercialisation stage (Galushko & Sagynbekov, 2014). In fact, academics prioritise their publications (Behboudi, Jalili & Mousakhani, 2011) to fulfil their key performance index and to get promoted. The worst part is that some academics found that commercialisation has no relevance to them (Farsi, Moderessi & Zarea, 2011; Boadu & Metla, 2008) and some may think that commercialisation requires too time consuming (Aziz et al., 2013; Galushko & Sagynbekov, 2014; Yaakub et al., 2011). Thus, this perception need to be changed towards achieving a sustainable commercialisation stage especially in the university.

There are many ways on how university supports for commercialisation of the research product. This can be made, for example through research contract, consultation and joint research (D’Este & Perkmann, 2010). Apart from these, university also facilitates through the development of the research management centre or technology transfer office. This centre is dedicated to encourage, administer and facilitate the commercialisation activity, to link with the industry people and to safeguard the interest of the university through intellectual property rights (Rasmussen, Moen & Gulbrandsen, 2006; Xu, Parry & Song, 2011). Furthermore, the success for commercialisation activities are also supported by strategic collaboration with the industry partner (Ramli & Zainol, 2013). Academic discussions emphasised that collaboration between university and industry can increase the rate for commercialisation of the research products (Decter, Bennet & Leseure, 2007; Teng, 2010; Yaakub et al., 2011; Behboudi, Jalili & Mousakhani, 2011; Salleh & Omar 2013; Kamaruddin & Samsuddin, 2013) However, to have an effective link with the industry, university should produce research product that meet the market requirement and consider the technological trend in the industry (Yusuf, 2006). To reduce the gap between university and industry, there are many strategic approaches either industry financially supports the university and academics are free to decide their research as agreed, or industry involves as part of the members but does not

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involve in research activities or industry requires specific types of research to the university, and they have more rights on the result from the research or industry and university are equally agreed on the research and its benefit (Lind, Styhre & Aaboen, 2013). Commercialisation policy and other key legislation are also important to promote rapid diffusion of the research product to reach the industry (Markman, et al., 2008) and to govern academic rights, ownership rights and sharing of the profit (Ab Aziz, Harris & Norhashim, 2011; Ramli, et al., 2013). Apart from that, collaboration between university and other agencies including research centres and industries are one of the strategies to encourage for research product commercialisation (Siegal & Wright, 2007; Ramli & Zainol, 2013). The Triple Helix model was introduced to capture the collaboration between university, industry and government and to promote a positive impact of commercialisation activities (Etzkowitz & Leydesdorff, 1995; Viale & Ghiglione, 1998; Safiullin, Fatkhiev & Grigorian, 2014).

Various programs and initiatives have been put forward by the university to encourage for an effective research product commercialisation. These programs include for example incubators, education and networking programs (Karlsson, 2014). Recognition in terms of incentives and rewards also play significant role to foster the commercialisation culture among academic researchers (Meigounpoory & Ahmadi, 2012). Some countries, for example Turkey has introduced tax exemption for their researchers to promote for commercialisation activities (Kaymaz & Eryigit, 2011).

Although many supports have been pursued for commercialisation activities, nevertheless, there are challenges that need to be addressed such as lack of funding, lack of collaboration between academic and industry, lack of emphasis on innovation and lack of human capital (Govindaraju, 2010). It is also hard to reduce the gaps between academic and industry due to tacit nature of knowledge (Etzkowitz, 1998). Apart from that, lack of expertise in the relevant field and lack of expertise in management skills are also identified as challenges for commercialising research products (San, Narayanasamy & Ahmad Dahlan, 2012). It was also observed that lack of technology transfer office or research management centre's capabilities to facilitate, monitoring and sustaining the commercialisation activities are found to be a challenge for commercialisation (Farsi, Moderessi & Zarea, 2011). It is said that this office or centre is still new and less experience in conducting commercialisation related activities (Yaakub, et al., 2011) and their personnel lack capabilities in marketing, technical and negotiation skills which lead to many research product remain uncommercialised and ended in the "valley of death" (Farsi, Moderessi & Zarea, 2011). This is fairly true especially in the Malaysian context, since commercialisation is just entered recently. Furthermore, research product failed to meet the market demand and lacked of competitive advantage (Farsi, Moderessi & Zarea, 2011) and research is conducted without giving any proper consideration to the industrial needs (Anbardan, 2013). Moreover, there are different motivations between university and industry; academics prefer to knowledge sharing, whilst industry tries to withhold the information

from their rivals (Aziati, Hazana & Ping, 2014; Ramli & Zainol, 2013; Fiaz and Naiding, 2012).

2. RESEARCH METHODOLOGY

This study analyses four main impactful factors that determine for a successful commercialisation of the research products in the Malaysian public universities. These factors are related to facilities and supports from the university, competency of the academic researcher, product competency and a strong collaboration between university and industry. Each of these factors are interrelated with each other. Thus, this paper discusses the following research questions:

- (a) What are the determinant factors for a successful commercialisation of research products in the public universities in Malaysia?
- (b) What recommendations can be made to ensure for a successful commercialisation of research products in the public universities in Malaysia?

A qualitative research method using semi-structured interview questions was employed to answer the above research questions. Six academic researchers have been purposely selected for the interview and they have successfully commercialised their research products. The six respondents were chosen based on their achievements in commercialising their research products either locally or internationally, they are also considered as key person in their areas of expertise. They also have more than five years experiences in collaborating with the industry and have gained national and international recognitions for their research and development achievements. Further, they represent academics from Malaysian public universities and for the purpose of anonymity, they are identified as DR, PS, PR, EN, EA and LYC.

The interview questions were designed based on the structure developed by Patton (2002) to capture the respondents' real experience, opinion and expectations related to factors and obstacles for research products commercialisation. Face-to-face interviews were adopted using semi-structured interviews with the six respondents. Each interviews sessions lasted from approximately 1 to 1 ½ hours and it was conducted at a different time and location. Each interview was recorded and it was transcribed verbatim. The meanings constructed from the interview data were e-mailed for the respondents' approval. In this regards, they were allowed to change information that did not represent their opinion and experiences. These follow-up checks from the respondents determines that researcher's subjectivity do not dominate the findings (Patton, 2002; Holliday, 2007). All data gathered from interviews were analysed based on axial coding.

3. RESULTS AND DISCUSSIONS

There are many factors that guarantee the success of commercialisation of research products. This study examines four impactful factors that determine commercialisation including facilities and supports from the

university, competency of the academic researcher, product competency and a strong collaboration between university and industry. This study recommends ways for improvement for commercialisation activities for research products that involve university, academics and industry partner. These elements are discussed below.

3.1 Facilities and Supports from the University

University plays an effective role in supporting and promoting for commercialisation activities in relation to

facilities, training and management. Intellectual property and commercialisation policy are important to support for research product commercialisation. The main objectives of this policy is to regulate in terms of ownership rights, management of intellectual property rights, promote and facilitate the exploitation and commercialisation of intellectual property. Issues related to facilities and supports from the university are highlighted in Table 1 below.

Table 1: Issues Related to Facilities and Supports from the University

Issues	DR	PS	PR	EN	EA	LYC
RMC/TTO facilitates and promotes commercialisation activities	/	/	/	/	/	/
Team of personnel need to be placed at TTO/RMC	/	/	/			
Sufficient funding attract the collaboration from the industry	/					
University promotes commercialisation through formal and informal platform		/		/		/

All of them agreed that that the function of the research management centre is undeniably important to facilitate and promote commercialisation activities in the universities. Research management centre or some universities refer as technology transfer office is dedicated to facilitate, monitor and promote issues related to research and development (R&D) and research products and commercialisation. Their role and functions are not only focused on this particular aspects, as they also provide a platform for building a networking with outsiders including industry people. Thus, in order to provide assistance in terms of legal agreement, a team of personnel need to be placed to this particular centre. Interviewee DR shared on this and stated that *“in order to support for engagement with outsiders, particularly industry people, we need a good team of experts comprising of accountant and good personnel to deal with business related matters as well as good public relation officer”*. Similarly, this was also observed by interviewee PR where he said that *“research management centre helps us to match the technology that we have with the potential industry and later they managed us to collaborate with the industry”*. This was also mentioned by interviewee PS as he stated that *“the personnel at the research management centre helps us [academic researcher] in term of providing platform for materialising the agreement made in the form of MOA and MOU. They also acted for us in term of promoting and supporting for commercialistaon activities”*

Research management centre provides a good platform towards a successful research products commercialisation. Their effective engagement in terms of providing assistance related to the understanding of the legal terms and business related activities guarantee for an effective product commercialisation in the university. However, to make for a more effective commercialisation processes, the personnel appointed must not be a full time academician. This will allow them to focus and dedicate

their expertise to promote and sustain for commercialisation activities.

Apart from that, sufficient funding provided by the university is said to be one of the determinant factor towards a successful commercialisation process. This will secure the industry partner to collaborate with the university and to put a trust from the industry people. University needs to dedicate such a huge investment especially at the early stage of commercialisation process to attract industry people to collaborate. Interviewee DR shared this and stated that *“we started with pre-commercialisation. We have the internal fund that enable me to buy a second hand machine for the brick manufacturing [his research product]. Even though it is old machine, at least it gives us some idea how the process works. So by using the machine, we are able to convince industry partner”*.

Since funding is the most critical part, investment from the university able to convince industry to work together with the university. It is also relevant to the Small Medium Industry which expected university to assist them financially for the mass production. Interviewee DR stated that university should committed in achieving their commercialisation and this commitment enable to convince the industry people.

In encouraging for effective commercialisation of research products, university should play an active role in promoting research products either formally or informally, either at national or international level. This can be made through academic conferences, scientific and technological exhibitions and competitions. This platform provides an opportunity for academics to expand their networking with other researchers and industry people. Interviewees EN stated that he managed to know his

industry partner through scientific exhibition, and he said that “I have improved of my research products, and with the help of the Ministry during the exhibition, I managed to impress the industry and from there I’ve got their contacts”. Similarly, this was also supported by interviewee PS where he stated that “we will use any platform to attract the industry collaborator, and if there is any industry looking for my product, high fibre food, I can help them and create a linkage to collaborate with the company. It is not that difficult to actually collaborate with the industry. We just need to actively promote our product. We need to promote our product through the television or radio, because this channel is having a very broad marketing and our media team from our university is very good.” Similarly, interviewee LYC has also commented that “if I want the press to cover the story about my research product and to get promoted, university will get them for me. I did not pay anything for that, university will do their part”.

There are various platforms that university may resort to promote for university’s research product, through social media or other mediums for commercialisation. A strong marketing strategies are important to sustain an effective commercialisation activities in the university.

3.2 Competency of Academic Researchers

Competency of academic researchers in relation to their skills, knowledge, attitude and characters are important elements to support for commercialisation activities. Technical and business related knowledge are important in attaining commercialisation activities. Academic should not only acquire the skills and knowledge related to scientific and technical, but also they should equip with business and entrepreneurial related skills. It is normally observed that it is not a critical issue for academic researchers to acquire technical and scientific knowledge but they lack business acumen and its related skills. Issues related to competency of academic researchers are depicted in Table 2 below.

Table 2: Issues Related to Competency of Academic Researchers

Issues	DR	PS	PR	EN	EA	LYC
Strong determination and passion for commercialisation		/				
Commercialisation should benefit the society as a whole	/			/	/	
Clear objectives and goals for commercialisation				/		
Time, effort and money dedicated for commercialisation activities	/		/	/	/	/

Academic researchers should have a strong determination and passion in pursuing for commercialisation activities. These characteristics are important to ensure commercialisation is a success and manage to enter research products to the market. Interviewee PS emphasised that he was so passionate about commercialisation. He was trained and interested to involve in business when he was so small. He commented that “I think commercialisation is about passion. I love business since I was in school. It taught me a lot of things. It brings me out from laboratory and meet many people”. This is a good character, since university is now moving towards developing an entrepreneurial university.

Willing to learn new things is also good attitude of the academics since university has just recently entered into the domain of commercialisation. Traditionally academics are more focused on the teaching and learning alone. Rather than focusing on doing experimentation or lab testing in the university, now academics have to focus to bring their products to the market. However, monetary form should not be the main agenda for academics, but commercialisation should benefit the society as a whole. This was agreed by interviewee EA where he said that commercialisation is not for his own personal benefit, but rather to benefit society as a whole. He is not seeking for monetary form for his own, he emphasised that “my aim is commercialisation; that is my passion. This is not about money. It is the way that I can contribute back to

the society and nation”. On a similar vein, interviewee EN focused to be market leader in his product purposely to contribute back to the society as a whole. He said that “I want to be the pioneer in this product. Nobody has created this before, and nobody has sold this before. So I want to be the first. Apart from challenge myself, I want to contribute to the country and society.”

To have clear objectives and goals are another important character for academic researchers. Interviewee EN proudly stated his product managed to help blind people to walk better. He said that “I believe that the market for my product is large. It can give huge impact to the blind people. This is the niche area, and so far the competitor is still lesser. Thus, we can provide a monopoly for the product, not to say number one, but only one.”

So far, there is no specific approach for commercialisation that is normally adopted by the university. For this reason, academics need to dedicate their time, effort and money to ensure that commercialisation is a success one. Interviewee EN admitted that he spent a lot of his time learning about commercialisation and he has to sacrifice time and

commented that “I spent a lot of times in learning commercialisation process from experts from other university. During the day time, I focused on my teaching and research activities, and in the evening I dedicated to commercialisation of my research product. Sometimes, I have to spent time until late night, just to learn about this”. Academic researchers should be able to sacrifice their times to pursue for commercialisation journey. Apart from spending so much time in the laboratory, they should be able to meet other people in an informal setting just to learn on how to commercialise research products successfully.

Furthermore, academic researchers should be able invest their own money to focus for commercialisation. Sometimes academics need to use their own money for the purpose of preparation in producing and promoting research products. In order to encourage for commercialisation activities, academic researchers need to be creative to generate their own income. Interviewee PR shared that his own experiences and stated that “at the beginning I spent a lot in the process of commercialisation. For raw material, I bought them using my own money. When the demand is increasing, I need to outsource my production. So I made a manufacturing contract and produced the pilot scale products. So this cost me money. Normally, it was a long process to get the financial aid from the university, that is why I used my own money first. So far, for commercialisation purposes, I have spent approximately around RM20 000”. The same observation was also made by interviewee LYL where he mentioned that “some people do not know that I have spent a lot of money. I have built a total of six buildings. I have rent a piece of land and I have to pay RM500 for the rental to build the first model house.”

It is essential for academic researchers to incur some cost at the beginning especially for the production and promotion of their research products. Although they might spend a lot at the early stage, however they can enjoy the benefit at the end. Using their own money has been emphasised by interviewee EN as he said that “we need to convince the university that our product has a demand. We need to invest first, only then university will provide some funds for us. Furthermore, university expects us to be determined in commercialisation for

them to allocate some funding”. Academic researchers is encouraged to use their own money first rather than too much reliance on the university budget. Interviewee DR of the opinion that “you cannot expect that the university produces your research product until it reaches the end users. But instead you have to interject if you find that the idea is good. You have to use your own money. You have to give a good idea, and you have to further educate those academic researchers. You have to invest your own money.”

Dedication and unlimited efforts need to be promoted among academic researchers who are pursuing their commercialisation stage. Two of the interviewees agreed that they have given total efforts towards reaching the commercialisation activities. Being disciplined, and highly motivated in their character and behavior have contributed to the success of commercialisation. For example, they need to do their own marketing for their research products. Interviewee PR stated that “I do it on my own first. Apart from the university, I also sell it in the retail shop. I always carry with me the research products whenever I go. I commercialise this on my own. I need to do this to increase my sale”. Similarly, interviewee EA shared that he has to do his own selling to increase the sale and to commercialise his research products. He promoted that whenever he joint any conferences and scientific and technological exhibitions.

3.3 Collaboration between Academics and Industry

It is always critical issue to note that there is a gap between academic and industry partner and there is a challenge to reduce the gap. Academic researchers and industry partner should have a common goal in achieving commercialisation activities. However, academic researchers need to have a proper and careful consideration to identify the best and right industry partner. Due to conflicting understanding between academics and industry, has led to many failures for commercialisation. Trust and confidence need to be promoted at the very beginning of commercialisation endeavor among those players. Conflicts and differences should be avoided and minimalised as it may obstruct commercialisation activities. Issues related to collaboration between academics and industry are discussed in Table 3 below.

Table 3: Issues Related to Collaboration between Academics and Industry

Issues	DR	PS	PR	EN	EA	LYC
Build a strong networking through many avenues			/			/
Academic and industry lacked common knowledge	/			/	/	

A strong networking with industry partner needs to be built to ensure a sustainable commercialisation process. There are many avenues in which academic researchers might be able to build a networking with industry partner. Interviewee LYC stated that “I am actively involved in the non-profit organisation and now I am a member of Construction Society of Malaysia (CSM). Since I have been actively involved with the society, so I managed to

organise seminars, short courses. So from there, I have a chance to know people, because of the sharing knowledge session.”



Building a strong networking is considered one of determinant factors for effective commercialisation of the university’s research products. As experienced by interviewee PR, he has the opportunity to learn about the needs of his research product by communicating effectively with the industry people. This is to ensure that the products produce by the university manage to cater the demand from the market. Furthermore, the collaboration benefits both parties, in terms of business related matters benefit the academics, and technical aspects of the products benefit industry partner.

However, it is quite challenge to have an ideal collaboration between academics and industry partner. Obviously, academic and industry lacked common knowledge. They understand different “languages” and it is a challenge to provide a closer link between them. Experience is one of the best lesson for academic researchers to determine the right industry partner. However, the task of identifying and finding the right industry partner is not easy, as claimed by interviewee DR *“for commercialisation, we went through a hard time. We learnt from a mistake and from our experiences. I have different experiences in dealing with industry people. I know what exactly what they want the moment they start talking, I know their mentality, what they think and how they think. If I feel that person good, then I will proceed, if it is not, then I will not proceed because some of them just look for funding.”*

Academic researchers should have a good whim and engage careful consideration in order to identify the right industry partner. Careful consideration needs to be placed because some of them might take unfair advantage on academic researchers without giving their full commitment. Networking is one of the best ways to identify the right industry partner. Moreover, apart from getting the list of industry people from the research management centre, academic researchers need to put their own effort to be introduced to the industry partner. Some academic researchers may consult a key person in the industry in order to build a good rapport with them.

3.4 Producing Innovative Research Products

Producing innovative research product is a critical for academic researchers. Industry did not expect something that academics manage to get through in the technical and scientific exhibition, but they expect the research to be translated into a viable market product. However, it challenging task for academic to produce research product that has a commercial value and a strong market value. Thus, it is essential for academic researchers not only to create and invent cutting edge products that enhance with unique features but also have a commercial value. Issues related to producing innovative research products are highlighted in **Table 4** below.

Table 4: Issues Related to Producing Innovative Research Products

Issues	DR	PS	PR	EN	EA	LYC
Producing a quality and reasonable price research product	/				/	/
Producing research product that benefits the nation					/	
Producing a unique research product		/				/
Producing a market ready research product	/		/			

Three of the interviewees in this study opined that they manage to attract the collaboration with industry people because they able to produce quality products with reasonable price. Interviewee EA shared his experiences and stated that *“if the product is really good and useful, and the price is reasonable, then there should be no problem”*. This is also similar observation made by interviewee LYC that *“I made a cheaper, stronger and lighter product”*. In comparing with the existing product available in the market, interviewee DR managed to produce his product with good quality and low price. By producing this type of research product, he managed to secure a collaboration with industry. He said that *“customers have started to ask about our product [the brick] because we are selling at 28 cent for each piece. This price is similar to a cement brick. Cement brick is not good as our brick. Clay brick is 45 cent per brick. But it is just a small amount, but if we talk a big project or big building, we use like 2 million bricks. So it becomes big”*

Apart from monetary purposes, research product should advantage the whole nation. Thus, academic researchers need to produce research products that tap the market needs. Thus, academics need to consider that products must fulfil the market requirements to enable the products sustainability in the future. Interviewee EA shared that *“my product was based on the problem occurred in the school. We solved the problem. Thus, whether the project is big or not, it must be useful for the society. Otherwise, your product is unable to be commercialised. [...] so back to the basic, what is the need of our society? So we need to do something new which people really need it”*.

Uniqueness is another character of research product that should be produced by academic researchers. Interviewee PS mentioned that *“my product is very high*



fibres, high shelf life, long lasting, and there are vitamins and minerals enhance in there [...] I made it suitable to be commercialised, and ensure its uniqueness". In commenting his product, interviewee LYC stated that "industrialised building system (IBS) offers advantages in term of economic, sustainability and environmental kind that benefit to the end user. So if you asked me what is different with other IBS system I will say that this is unique because it combines between pre-cast and cast institute."

Producing market ready product is another criteria to determine the commercialisation activities. Nowadays, industry prefer to be a consumer for a market ready product from the university rather than as manufacturer. Two of the interviewees agreed on this, interviewee PR stated that *"my product is actually a market ready product. Industry can buy and add this vitamin to their main product."* Interviewee DR stated that *"the acceptance from the industry is depended on the nature of the product; straight forward product and ready to be used are more preferable by the industry. It is just a matter of marketing. Like my product, the brick is quite straight forward for use in the construction industry."*

4. CONCLUSIONS AND RECOMMENDATIONS

Commercialisation of research products has now become a critical issue especially in the university. Since there is no standard approach for commercialisation activities, university is encouraged to adopt a flexible approach for commercialisation. Although there are many factors to determine the successful commercialisation of the research product, this study focuses on the four main impactful factors. Facilities and supports in term of good personnel and team of experts are essential to sustain for commercialisation activities in the university. Facilities and supports include also the development of research management centre or technology transfer office to facilitate and promote commercialisation activities in the university. Other than that, the centre also manages issues related to intellectual property and provides platform to bridge the gap with the industry. This centre also dedicates their time to promote research product through formal or informal channel. Furthermore, academic researchers need to be competent in term of their skills, knowledge, attitude and character to ensure a successful commercialisation. Thus, they need to equip themselves with business and entrepreneurial related skills to promote for commercialising of their research products. Furthermore, they need to set a clear goal and objectives for commercialisation especially at the beginning of the research projects. Collaboration between academic and industry is also important to guarantee the success of the commercialisation of the research product. This ensures that research product can easily penetrate the market. Academic researchers need to identify and select the right business partner to ensure that commercialisation endeavor is successfully achieved. Research product produces should tap the market needs. Thus, academic needs to produce research product that is unique and having a commercial value to guarantee that it can successfully enter into the market. This study treats that

these four impactful factors are intertwined with each other to ensure that commercialisation activities are effectively achieved.

This study aims to make some recommendations to encourage and promote research products commercialisation in the university in Malaysia. University should play an active role to enculturate entrepreneurial spirit among academics. Thus rather than focusing on teaching, learning and researching per se, university now should move forward to equip with business related skills. A clear and a well-defined function of the research management centre should be set up to facilitate and promote commercialisation activities among academic researchers. Furthermore, a competent, skilled and permanent staffs need to be attached to the centre in relation to management, business, legal and technical to assist academic researchers in pursuing commercialisation journey. Moreover, university should build, develop and sustain a good relationship with industry partner to encourage for a more effective commercialisation. A recognition in the form of promotion or other incentives or rewards should be emphasised for academic researchers to reach commercialisation stage. Collaboration between industry and university need to be effectively bridged. Thus a platform of understanding should be made accessible between both parties in order to enhance the commercialisation activities. Academic researchers should not treat a limited funding as the main obstacle for them to embark into commercialisation activities, rather they have to be creative to produce a quality, unique and innovative product to meet the industry requirement. There are several quality of successful academic researchers who managed to commercialise their products including sound judgment, knowledgeable, and to have a strong business acumen.

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