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**YOUNG TECH-ENTREPRENEUR'S AGILITY AND
COMPETITIVENESS IN MALAYSIA: ISSUES AND
PERSPECTIVES**

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Abstract

Disruptive technologies of fourth industrial revolution emanate numerous challenges and opportunities to survive and compete in the highly dynamic market. This study aims at investigating the factors that inhibit the agility and competitiveness of young technopreneurial firms during the Fourth Industrial Revolution (IR 4.0). IR4.0 is a new trend that influences the business operation of young technopreneurial firms and if they do not keep abreast with these changes, their survival will be at stake. As such, it is pertinent to understand what are the factors that may hamper them from surviving in the era of IR4.0. This study contributes to the literature by presenting the interview findings of eighteen entrepreneurs who operated as young technopreneurial firms. The respondents participated in a series of semi-structured interviews on the inhibitors affecting their agility and competitiveness. The findings offer an understanding on the relationship between inhibitors and the agility and competitiveness of young technopreneurial firms in the era of IR 4.0.

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Keywords: Agility and competitiveness, individual, Industrial Revolution 4.0, inhibitors, Malaysia, organizational and institutional factors.



1. Introduction

Over the past few years, the topic related to technopreneurship has captured the attention of policy makers and academics. They acknowledged that it has a positive impact on economic growth, particularly during the current Industrial Revolution 4.0 and digital era. Based on extensive research, few studies have defined technology entrepreneurship as being the connector of two related and strongly established fields, i.e. technological innovation and entrepreneurship (Beckman et al., 2012; Shane & Venkataraman, 2003). Entrepreneurship and technology entrepreneurship are concepts that have various aspects involving many actors and multiple analysis levels (Garud & Karnøe, 2003). Opportunities that are technologically related may be acknowledged and exploited by embarking into new ventures, whereby this is known as “Technopreneurship”. Nonetheless, these ventures may also be undertaken by group or individual of existing firms internally (Clarysse et al., 2009).

1.1. Literature review

A review of literature suggests that there are many factors affecting the competitiveness of new start-ups including technopreneurs. These factors were then classified into Inhibitors which could be dissected into four different levels of factors namely Individual factors, Organisational factors, Institutional factors, and Environmental factors.

1.1.1. Individual factor

The factors that hinder and impede the development and growth of young technopreneurial firms are termed as inhibitors. This study aimed at finding out the individual factors responsible for impacting young technopreneurial ventures’ agility and competitiveness in Malaysia. The individual factors affecting the young technopreneurial agility and competitiveness are lack of experience & training, lack of business acumen, and lack of networks.

In today’s competitive world, companies found that reduced cost, better quality and providing enhanced customer service are still inadequate for the sustaining of competitive advantage (Selvarani & Venusamy, 2015). In achieving competitive advantage, businesses have to become more assertive, flexible, innovative, and act swiftly. A main factor to being competitive for an international company is innovation. The word innovation changes the way of doing business, which helps the young technopreneurs to achieve their competitive advantage (Ahmedova, 2015). Some of the challenges faced by the young technopreneurs in Malaysia are lack of experience and training, lack of business acumen, and lack of networks.

The organizations face this situation when they do not have good consultant who can guide them in training. Consultants who are good will usually try to minimize the time and efforts, as well as assist in preventing problems. However, most of the studies shows that small and medium sized enterprises lacked the experience in working with consultants (Bessant & Rush, 1995; Selvarani & Venusamy, 2015). The lack of knowledge and training makes difficult for the organizations to identify which projects are essential in achieving their competitive advantage (Thong, 1999). Therefore, to overcome this situation entrepreneurs should focus on training and experience of their employees.

To be successful entrepreneurs and sustain their businesses, it is vital that they retain their customers as well as establish and develop their networks. It is difficult for the entrepreneurs to know who their

customers are, and to whom they should believe in for developing of networks (Ajzen, 1991). Therefore, the entrepreneurs divided the customers in accordance to their characteristics and strive in understanding and providing goods and services that fulfil their requirements (Pei et al., 2010). For Malaysian technopreneurs, their key challenges are the analysis of local firms, the identification of shared values and the practices of technopreneurial. These are the basics in promoting a true Malaysian entrepreneur with Malaysian identity. In view that there is more exposure for Malaysia in regard to global commercial practices, the technopreneurs must lead in the identification of Malaysian culture that affects their business behaviours (Pei et al., 2010).

1.1.2. Organizational factor

This study aimed at the organizational factors responsible for impacting young technopreneurial ventures' agility and competitiveness in Malaysia. The organizational factors influencing the young technopreneurial agility and competitiveness are lack of skilled, talent, technology constraint, marketing issues, financial constraint, physical resources, R&D issues, and research support.

Most entrepreneurs started their ventures from the bottom where they worked with firms for several years whereby they usually used to be supervisors or managers (Selvarani & Venusamy, 2015; Tornikoski et al., 2017). They might be IT illiterate and usually have much resistance to working process's changes. This is because they are used to their usual ways of doing tasks. As many entrepreneurs are lacking in technological knowledge, they need some support from other companies and MNCs. The IT personnel can help them in building up their technological knowledge, which will lead towards improved performance of their firms (Pei et al., 2010). As, young technopreneurs have just started, they usually have limited financial capital. Therefore, they will initially choose an inexpensive solution (Beckman et al., 2012). In Malaysia, a significant number of new job creation and the nation's GDP are being contributed by activities related to technopreneurial ventures (Jusoh, 2006; Pei et al., 2010). This significant economic impact has fuelled the current interest in research on the technopreneurial phenomenon.

1.1.3. Institutional factor

The institutional factors are also responsible for impacting young technopreneurial ventures' agility and competitiveness in Malaysia. This study aimed at several institutional factors such as red tape and bureaucracy, technology-business mismatch, and lack of mentorship and advisorship.

There are many factors that could contribute to the failure of technopreneurship. One of the main reasons is that it could be due to poor scheduling system. Practical scheduling problems are dynamic, uncertain and often unpredictable due to the continuous arrival of new and unforeseen orders, and the occurrence of all kinds of disturbances (Chong et al., 2003). Another challenge faced by the technopreneurs is the technical problem related to machines used in manufacturing processes, in which highly requires an expert knowledge. The breakdown of machines would cost the business significant amount of money due to production delay; as result of repair or replacement of machines, and the difference between actual and optimal production time. With the closing of gap in industry linkages, the young technopreneurs could attain business opportunity through the exposure and experience in real business landscape. Additionally, the industry can also satisfy its social obligation and support (Abdullah et al., 2004). Meanwhile, the

assistance given by the government also has a significant role in the technopreneurs' success, particularly during the starting up of business (Pei et al., 2010).

1.1.4. Environmental factors

The environmental factors are responsible for impacting young technopreneurial ventures' agility and competitiveness in Malaysia. This study aimed at several environmental factors such as rapid changes in technology, changes in market demands, and competitors.

The occurrences of financial turmoil, climate instability and other global issues have caused the attainment and sustaining of competitive advantage to be difficult by businesses; but they can attain a non-permanent advantage (D'Aveni et al., 2010). However, in a less competitive market where there is small technological development or less change in consumer liking, dynamic abilities that are strong would possibly be expensive or even disastrous due to their maintenance costs (Schreyögg & Kliesch-Eberl, 2007). Therefore, the association of competitive advantage and dynamic abilities could be weak or negative. Meanwhile, in a turbulent market there will be opportunities passing swiftly, and the ever-present of competition threats. This type of environment will reduce competitive rank, and the possible value of prevailing ability. Consequently, this will force the firms to undertake complicated changes frequently. Hence, the dynamic abilities are taking a more vital function. In a significantly competitive market, there is scarcity of resources; hence to obtain short-term advantages, businesses must have efficient market sensing, make changes when appropriate and undertake dynamic implementation when there are market changes (D'Aveni et al., 2010). However, in a quiet market where resources are easily obtained, companies may adopt past strategies and allocate their resources without constrain to adapt to the market changes. This consequently facilitates the attainment of long-term competitive advantage through the insignificant dynamic ability (Li & Liu, 2014). As such, in a quite stable market, the prevailing "make a living" operation is enough in meeting consumer demand, attain better profitability, and sustain competitive advantages; hence rendering dynamic abilities non-essential. Empirical studies have also found that the association of company performance and dynamic abilities as insignificant in a stable market. However, in an unstable market, it is a positive association, hence signifying a moderating role (Drnevich & Kriauciunas, 2011; Li & Liu, 2014).

1.1.5. Agility and competitiveness of technopreneurs

The business literature was the first to use the word 'agility' in association with flexible production system; where its usage was often interchanged with the word 'flexible' (Li et al., 2008). The links of agile-flexible and competent-capable are similar. For capability that is external-focused, it is agility; while for internal-focused competency, it is flexibility (Swafford et al., 2006). Hence, agility possesses a unique characteristic in which it is a market detection ability providing the exploration and exploitation of opportunity for arbitrage (Roberts & Grover, 2012). This view is similar to the knowledge that agility is a dynamic ability (Roberts & Grover, 2012). On the other hand, there is another view that agility is beyond an ability, it is also an aspect or a characteristic of agile companies that might need a set of meta-capabilities (Doz & Kosonen, 2008). Companies that are agile-focused have to be familiar with effective acquiring of resources and integration of capabilities (Chen & Chiang, 2011; Shin et al., 2015).

1.2. Theoretical framework

Based on the discussion above, this study proposes a framework that could explain the relationship between the inhibitors (constraining factors) and technopreneurial ventures' agility and competitiveness. The factors that increase the young technopreneurial agility and competitiveness are individual factors, organizational factors, institutional factors, and environmental factors. The framework of this study is presented in Figure 01 below.

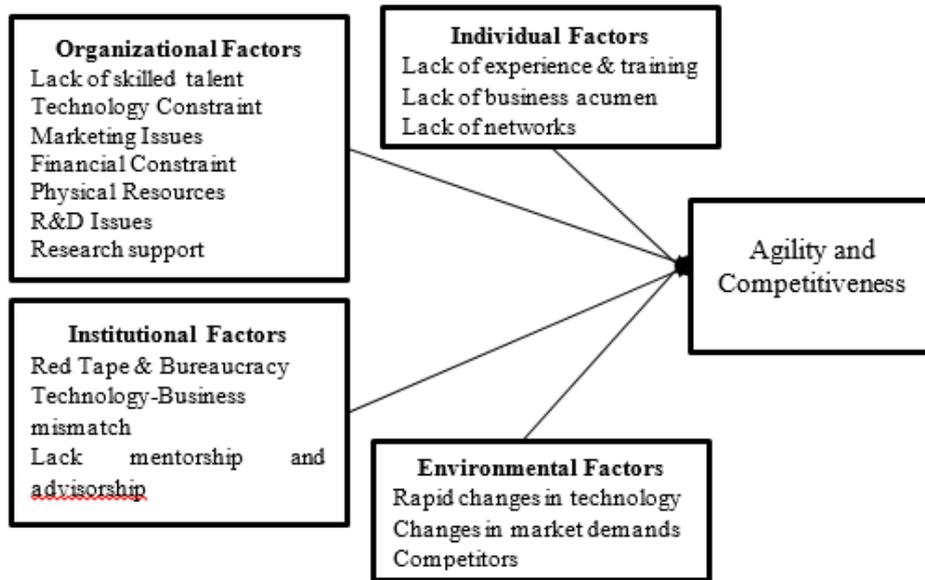


Figure 01. Research framework

2. Problem Statement

In the context of Malaysia, the speed, density and scale of technological changes posed challenges to these firms especially in the face of Industry Revolution 4.0. A scrutiny of the relevant literature suggests that debates surrounding the origins of technology-based competitiveness are overwhelming; surprisingly however little is known until today (Tornikoski et al., 2017). Similarly, according to Beckman et al. (2012), the importance of the integrative relationships among individual, organisational, and institutional factors in explaining entrepreneurial firms' performance has been highlighted. Nevertheless, many themes remain relatively unexplored especially in understanding the competitive level of young technopreneurial firms.

3. Research Questions

Based on the problem statement and research question, this paper aims at answering the questions below;

Q1: What is the issues techno-entrepreneurs are facing during the industry 4.0 era?

Q2: What the issues under internal and external factors relevant to the business operations of techno-entrepreneurs in industry 4.0?

4. Purpose of the Study

The prime motivation of this research is to investigate the enablers and inhibitors impacting young technopreneurial ventures' agility and competitiveness. It is based on this premise that this research attempts to investigate the factors impacting agility and competitiveness of young technopreneurial ventures from the lens of individual, organizational, and institutional level factors. By understanding the enablers and inhibitors at these three different levels, a more holistic and comprehensive understanding of the “what” and “how” issues that build or deter the competitiveness of young technopreneurial ventures could be generated.

5. Research Methods

For the selection of suitable study method, the research questions' nature has to be given a consideration (Morse & Richards, 2002). In view that the questions posed by this study are exploratory, the data collection is done using the qualitative approach. Morse and Richards (2002) mentioned that this method is to be adopted if “the purpose is to learn from the participants in a setting or process the way they experience it, the meaning they put on it, and how they interpret what they experience” (p. 28). Moreover, Snell and Lau (1994) stated that “the practical advantage of such research (qualitative) is that it can avoid the dangers of imposing inappropriate ‘solutions’ borrowed from larger organisations in the West” (p. 4).

The sample of study was selected based on purposive sampling based on the following inclusionary criteria:

- a) Firms must be operating within 5 years or less
- b) Firms that are involved in hard sciences or with technological products/processes but not applications or websites.

Altogether eighteen entrepreneurs who operated young technopreneurial firms participated in a series of semi-structured interview from May to August 2018. Appendix A shows the interview protocol developed before the interviews. It is to provide the direction and establish a consistent interview setting. The profile of the respondents is depicted in Table 01 below.

Table 01. Respondents' profile

Respondent	Gender	Age	Education level	Business Type/Sector	Years of the Company	No of employees
#1	Female	31	Masters in Biology	Research and Development Service (Botanical products - Pharmaceutical and Cosmetics)	5 years	4
#2	Female	31	Degree in Biology	Food based powder (Green Banana Flour-Gluten free)	5 years	5
#3	Female	30	Degree in Biotechnology	Manufacturing & Services (Tissue Culture)	5 years	4
#4	Female	31	Degree in Engineering	Foods and Beverages (Halal-based Diet Chocolate)	2 years	5

#5	Male	36	BSc. Biotechnology	Waste Water Treatment Technology	3 years	2
#6	Female	31	Bachelor Degree	Agro-based technology (liquid-based mushroom)	4 years	2
#7	Male	30	Bachelor Degree	Technology-based Leather Design and Production	4 years	2
#8	Male	41	Diploma	Manufacturing & Services (Go Green stationery and printing)	3 years	3
#9	Male	37	Bachelor of Engineering	Engineering-based technology	2 years	6
#10	Male	35	Degree	High-tech 3D Printing	4 years	3
#11	Female	37	Masters in Technology Management	Technology Design	4 years	7
#12	Male	35	Degree in Business and Commerce	Food Technology	3 years	3
#13	Male	30	Diploma	Palm Oil Biomass	5 years	1
#14	Male	21	Diploma	Organic Mushroom	< 1 year	2
#15	Male	37	MBA	Plastic Industry	5 years	10
#16	Male	25	Degree in Business	Water technology	3 years	4
#17	Male	41	Bachelor Degree	Technology based-wood craving	5 years	8
#18	Female	34	Degree	Agro-technology (chillies and leave vegetables)	5 years	23

6. Findings

Based on the thematic analysis conducted on the transcribed interviews, several domains of Inhibitors were extracted and clustered into 4 different categories (1) Individual Factors (2) Organisational Factors (3) Institutional Factors and (4) Environmental Factors. The themes were clustered based on the following domains:

Inhibitors: factors that hinder and impede the development and growth of young technopreneurial firms

6.1. Individual factor

1. Lack of experience and training in specialized areas

With reference to the statements of respondents #14, and 16, Technopreneurs are facing insufficient specialized training and experience.

“Still in the process of startup hence there are a lot of things need to be learned and sometimes felt demoralized due to various problems encountered” (#14).

“Young and inexperienced and educational backgrounds that are not compatible with the business” (#16)

2. Lack of business acumen (i.e., marketing knowledge and financial knowledge, poor sales and marketing planning)

Similarly, technopreneurs are lacking knowledge relevant to the finance and business operation in the context of marketing and sales.

"Knowledge in business and management is important to ensure the smooth handling of a successful business; however, for me, I have to enhance my knowledge in business and finance to run this business effectively".

3. Lack of networks and referrals

It is difficult to penetrate the market due to lack of networks and referrals. There is also lack of networking among entrepreneurs in the same industry/ sector to support each other.

"My networking is very limited, and I find it difficult to penetrate the market" (#16)

"I need support in networking and get connected to people in the same industry. So, we can help each other" (#5).

6.2. Organisational factor

4. Lack of skilled/qualified employees

There is insufficient staff due to the difficulty in getting qualified people in the area. The lack of staff results in difficult projects not being resolved according to the designated period. There is also lack of skilled staff to manage research laboratories; hence requiring expertise from external R&D consultant that involves large expenditures. The same is depicted in the statement below.

"...customer demand for services offered has increased but currently, I am dealing with labor shortages and I can only afford to handle one or two projects per year because it is difficult to finish according the designated period due to shortage of labor" (#2)

5. Constraints in terms of technology and machines (Outdated technology, costly technology)

Technology changes affect existing products and increase overhead costs. There are updated machineries and equipment - hence it is difficult to provide services that meet current market demand. Technology plays an important role in developing products, but the lengthy maintenance and repair period delays the production. The statement below is depiction of these interpretations.

"because of the financial problem, I realized that the most frequent issues my company faced are related to machines that are not up to date to conduct research" (#1)

The changes in technology give a huge impact on the production of this product. This is because the advancement in technology gives the power to the consumer to easily get details about the advantages and benefit of the product in the market. Therefore, the use of advanced technology is important in gaining the trust of consumers about the benefit and goodness of the product manufactured.

6. Marketing and Promotional Issues

- Need to create awareness, interest and confidence in new products. Lack of market acceptance of new product – need to create more awareness of the products.
- The benefits of this product are still unknown to customers and require more in-depth explanation, especially through social media
- It is difficult to gain customer confidence because the negative customer perceptions about products from the lab
- Need to invest in branding to be able to take the product and service development to a higher level.

- Need to invest on the designing of effective advertisements as well as to embark on various distribution channels.

“Among the main challenges in running the business include getting access to the market. Or one thing there is lack of information about the benefits and advantages of the product. It is difficult to convince customers without proper scientific support from research” (#2).

“The business that I am into is very challenging because many farmers think that seeds from the lab and test tube lack in terms of quality. The issue here is that the farmers are doubtful about tissue culture. To overcome this problem, I went straight to the farms to meet the farmers face to face but again this incurs a lot of cost” (#3).

7. Financial Constraint

Technopreneurs face shortage of fund to upgrade technology, acquire more space for business and expand their businesses.

“There is still a shortage of funds to upgrade technology that can produce large and fast product capacity (#5)”.

8. Constraints in terms of physical resources (i.e., lab, space, R&D facilities)

Technopreneurs have also raised concerns about the limited experiment labs, huge experimentation costs, and lack of space to operate large businesses.

“The issue I realized is that my company needs larger lab, management space and some up to date machines to research. But our company is still in the initial stage, our financial is not yet strong and we can't spend on larger lab” (#1).

“The demand for the product is always there...it increases gradually but we are constrained by the small size of our factory that limits our production capacity. Hence, we are unable to meet the demand for our products” (#2).

9. Raw material issues – lack of supply

There are limited suppliers for raw material. Distance and insufficient raw materials make it hard for ecopreneurs to run their operations.

“It is difficult to get the raw materials in developing products that meet their request. This may affect the production of the product and lead to the bad image and service of our company”.

10. Lack of R&D capability

The technopreneurs complained about the limited research and development expertise and support as depicted in the statement below.

“Because we lacked skilled staff, we cannot afford to have our own R&D department, we have to acquire services from the R&D consultant in managing our R&D...this involves a lot of cost. However, we are doing our best to manage the business successfully” (#3).

11. Limited market accessibility

Tecnopreneurs find it difficult to enter the market as consumers are still unsure and do not understand about the product.

“I find it difficult to convince the customers of the uniqueness of my products given the people's mindset. For instance, I found that they still think organic agriculture is a new method of modern mechanization of

agriculture; some people think it's a way to impose a higher price; But the truth is this business is environmentally friendly which saves energy, resource and causes less environmental damage”.

12. Limited research support from universities and research institutes

There is lack of academic research and collaboration between industry and academia.

“The lack of further research in supporting the advantages of the product makes it hard for the manufacturer to gain the trust of the consumers about the used, effectiveness and benefit of the product. There is still lack of university research on the effectiveness of this product even though there is an existing research by University A, especially for diabetic patient”.

6.3. Institutional factor

13. Red tape and Bureaucracy (Administrative / Procedural Issues)

Technopreneurs complain about the procedure of getting finances and find it to be time consuming. The complicated process of fund withdrawals slows down the production of product.

“Sometimes we received financial support but the process of using the fund is too complicated and time-consuming. Besides, due to the terms and condition, we cannot even use the fund to do product development even though the money is there” (#2).

“Monetary issues arise when the process to withdraw the money took too long and some of the activities that involve money such as buying of a machine is often disrupted. Most of business development activities are often disrupted because of the delaying in receiving the fund. This may affect the production of the product.” (#3).

Sometimes too many procedures and red tapes increase our cost of doing business. We need to keep our cost low and at the same increase our quality. In fact, soft loan/grant/seed fund should look at what being achieved instead of by paper work only.

14. Mismatch in Technology-Business Support

There is a lack of crucial alignment between technology and business capability. There is a need to update technology to be relevant to the Industry 4.0 demands. The statements below by the respondents clearly indicate these inadequacies.

“It is important that the technology given to us is well-tested in the market and compatible with the business”.

“We need a technology that is in line with the demands of Industry 4.0. Not just any technology”.

15. Lack of mentorship and advisory assistance

As per the statement below, technopreneurs need mentors and advisors to support young technopreneurs in terms of technical as well as moral support.

“We need consultant to motivate us. As you know we are new comers in techno business. We need positive and strong motivation, instead of just requesting our report about how our business is running so far. We need someone who can support us mentally and physically, it is not just about documentation and report submission. We suffer mental break down, no one give their hands to bring us up from falling. They left us without knowing where to go. We are still young, and we desperately need guidance and motivation”.

6.4. Environmental factor

16. Competitive and hostile environment

A vicious environment can be identified through a competitive pricing and products; rapidly changing technology, competitive distribution channels, regulatory restriction, material shortage and minimal customer loyalty (Miller & Friesen, 1983). The highly competitive and rapid changes in technology make it difficult for new companies to follow the fast-changing customer demand, unexpected customization, and stiff competition with more established companies. The statements below indicate these interpretations; *“Green technology has become a phenomenon that has been widely discussed in the era of Industry 4.0. Most agencies encourage technology entrepreneurs to adopt green technology. This has given a big impact on my business because it requires a lot of cost to keep on upgrading the technology. What I can say is the aggressive technological change brings great challenges to new entrepreneurs like me”.* *“Meeting customer demands is important; however, they often ask for the unexpected product design that sometimes it is difficult for us to get the raw materials in developing the product to meet their request. This may affect the production of the product and lead to the bad image and service of our company”.*

6.5. Discussion

The present study that involves a series of interviews conducted among technopreneurs has managed to extract several important insights into the enabling factors that facilitate the development and growth of young technopreneurial firms. The Inhibitors include several domains that are related to the Individual Factors, Organisational Factors, Institutional Factors, and Environmental Factors.

In the quest to obtain information related to the experience of young technopreneurial firms in dealing with day-to-day challenges as well as the challenges to grow their businesses, majority of them had highlighted on the importance of the followings:

- a) possessing entrepreneurial skills and competencies (individual factor),
- b) enhancing organisational capabilities and competitiveness (organisational factor),
- c) obtaining support and assistance from relevant agencies and networks (institutional factor), and
- d) the effect of environmental factors (i.e., the rapid growth in technology especially in the era of Industry 4.0)

It can therefore be surmised that, the interactions among all these actors (Individual, organisational, institutional, and environmental factors) as well as the systemic integration among Individual-Organisational-Institutional-Environmental nexus are important to ensure that technopreneurship agenda in Malaysia achieved its intended objectives.

7. Conclusion

In conclusion, the present study has unearthed important insights into the factors that could facilitate and at the same time hinder the development and growth of young technopreneurial firms. Notably, the findings demonstrate the importance of systemic integration among actors within the entrepreneurial ecosystems which include the (1) entrepreneurs themselves, (2) the resources and capabilities of the firms, (3) the intervention and support mechanism from relevant agencies and institutions as well as (4) the business environment. The identification of issues and challenges within this technopreneurial ecosystem

in the context of Malaysia is hoped to serve as a basis for better formulation of policies and strategies to spur the development and success of technopreneurship agenda in Malaysia. The study will investigate the prevalence of these factors in the context of larger population of technopreneurs in Malaysia to enable generalisation to be made to technopreneurship context in Malaysia.

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Note: University A – USM

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