

TECHNOLOGY ENTREPRENEURSHIP IN SRI LANKA – WAY FORWARD

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ABSTRACT

Technology entrepreneurship is rapidly gaining attention in the business field with the developments in various technologies worldwide. Innovative-minded people have started business firms to deliver technology products and services as technology entrepreneurs. Business-minded engineers are foremost among them. Although numerous studies are conducted worldwide focusing on technology entrepreneurship as an emerging field of study in entrepreneurship, the Sri Lankan context lacks such studies due to the emerging nature of techno-entrepreneurship within the country. With the hope of expanding the existing knowledge base of technology entrepreneurship in Sri Lanka, this study was conducted to gather the business advice of established techno-entrepreneurial engineers, which can be used to guide emerging techno-entrepreneurs to success. This study was conducted qualitatively by holding face-to-face interviews with a purposively selected sample of twenty-two entrepreneurial engineers in Sri Lanka. Voice-recorded interviews were transcribed verbatim and analyzed employing the inductive thematic method with the assistance of NVivo software. Four key themes emerged from the data as advice for emerging techno-entrepreneurs: accept challenges and work hard, be an expert, be ethical, and work for satisfaction. The above findings can benefit emerging and prospective technology entrepreneurs in Sri Lanka to make their entrepreneurial journey successful and sustainable, eventually contributing to the country's economic development.

Key words: Engineers, Technology entrepreneurs, Success, Sri Lanka

1. Introduction

It is no wonder that key role models in the technology entrepreneurship domain are engineers. World-leading and successful technology entrepreneurs like Mr. Mark Zuckerberg (Facebook), Mr. Jeff Bezos (Amazon), Mr. Carlos Slim (Telmex), Mr. Larry Page (Google), and Mr. Mukesh Ambhani (Reliance Industries) are professionally qualified engineers. (McFadden, n.d.). They have provided lot of business advice for budding technology entrepreneurs to guide them to business success. Although not in the billionaire capacity, Sri Lanka too has successful techno-entrepreneurial engineers who have become business leaders in Sri Lanka. Like in the international context, this is the high time to identify and disseminate their business advice for the betterment of the prospective and emerging technology entrepreneurs in Sri Lanka.

2. Literature Review

When it comes to promoting economic growth and development in any country, entrepreneurship is a topic that receives a lot of attention worldwide (Matusik, 2016). Technology entrepreneurship is an emerging sub-domain within the mainstream domain of entrepreneurship. A study on technology entrepreneurship can be differentiated from research on more traditional forms of entrepreneurship because the former focuses on how opportunities are created through scientific and technological advancements. As a result, technology entrepreneurship is highly concerned with technological advances and the emerging markets and creative goods that these advancements frequently make possible (Beckman et al., 2012).

Technology entrepreneurship can be defined as 'recognizing, creating, exploiting opportunities, and assembling resources around a technological solution, irrespective of the organizational context' (Harms & Walsh, 2015, pp 554). Specifically, technology entrepreneurs face more significant technological uncertainty, have higher financial requirements, possess greater essential competencies, and must address industry-specific frameworks in their entrepreneurial endeavours (Harms & Walsh, 2015). If the emerging tech-entrepreneur does not know the art of running a firm, they may not be able to achieve business success while facing the above challenges. Opportunity recognition for a technology entrepreneur begins with the identification of a need or a change. It concludes with the development of innovative solutions that are capable of validating and recognizing the future potential economic value of the venture. They are required to participate in several other activities, non-technical ones that are related to management. These tasks include creative thinking, incubating, demonstrating, validating, promoting, and maintaining their innovations (Roja & Nastase, 2014).

The capability to compare current and future technologies, the capacity to spot high-potential, technology-intensive commercial opportunities to gather resources such as talent and capital, the ability to manage fast expansion and significant risk using principled decision-making skills, and the capability to compare current and future technologies are all necessary skills for technology entrepreneurs (Dorf & Byers, 2008). Since most technology entrepreneurs are scientifically qualified personnel like

engineers, they should have sufficient technical and managerial knowledge to run a technological business firm (Pordan, 2007). Jones-Evans (2006) also highlighted that most technological entrepreneurs who have started tech firms previously worked in similar technical industries. Because of that, many engineers have become successful technological entrepreneurs locally and internationally (McFadden, n.d.; Wijesinghe et al., 2020). Policy-makers of a country should attempt to establish a variety of regulations and engage in industrialization, which has been essential in fostering the growth of techno-entrepreneurial endeavours to gain economic development for the country (Abdullah, 2009). Furthermore, it was identified that moderate level of R & D positively affects the creation of new technology-based firms in most of the countries (Colovic & Lamotte, 2015). It can be recommended to have a complete understanding of the difficulties that are presented at each stage of the growth of techno-entrepreneurship, it is necessary to do in-depth research and testing on all elements of techno-entrepreneurship (Fowosire et al., 2017). Hence, investigating the business advice of established techno-entrepreneurial engineers in Sri Lanka can be identified as a timely requirement to disseminate such findings among the business community to nurture & equip future techno-entrepreneurs with that knowledge.

3. Methodology

This study was performed qualitatively due to the lack of availability of previous studies (Sekaran & Bougie, 2016) conducted on techno-entrepreneurial engineers in the Sri Lankan context. This study employed a semi-structured interview, the most promising method of data collection (Cresswell, 2014). Purposively selected sample of twenty-two techno-entrepreneurial engineers were interviewed face to face to collect data to achieve the objective of this study. The reason for choosing only the engineers as the sample was that they had higher technical know-how than other techno-entrepreneurs. Participants were professionally qualified engineers serving as owners/managers in small to large-scale techno-entrepreneurial firms in Sri Lanka. They were graduates of Civil, Electrical, Mechanical and Chemical engineering disciplines. Their entrepreneurial experiences range from 3 years to 40 years. Only male entrepreneurial engineers could be interviewed due to the difficulties encountered in finding female entrepreneurial engineers for this study during the study time frame. Interviews were voice recorded with the participant's consent and transcribed verbatim for analysis. One of the convenient and flexible analysis methods in the qualitative domain, i.e., inductive thematic analysis, was employed to analyze the interview data with the support of the NVivo software (Braun & Clarke, 2013). Findings were further discussed with a few participants and experts in the field at the later stage of the study to enhance the study's trustworthiness (Cresswell, 2014).

4. Results & Discussion

Inductive thematic analysis of the interview transcripts has revealed the emergence of four themes of business advice for the prospective and emerging techno-entrepreneurs

in Sri Lanka. This article shall refer to the techno-entrepreneurial engineers who participated in this study as "Respondents" from here onwards.

Table 1: Key themes of business advice and their sub-themes

Themes	Sub-themes
Accept challenges & work hard	Accept challenges, work hard, find opportunities, plan everything, have some finance to survive, have a good team
Be an expert	Master technical knowledge, learn management, be innovative, be confident
Be ethical	Follow ethics, be honest, avoid bribery
Work for satisfaction	Select a business which can give satisfaction; start a business you know

4.1. Accept Challenges & Work Hard

Entrepreneurs are born to accept challenges and work hard (Chell, 2008). Respondents have advised the future techno-entrepreneurs to accept challenges & work hard. A respondent has stated: *"You should love to take challenges. Because without taking challenges, if you try to live within your comfort zone, if you don't want to go away from the comfort zone, it is very difficult to be an entrepreneur"*. Many successful entrepreneurs have revealed that they are always willing to accept challenges. Accepting challenges create risk for entrepreneurs. Wijesinghe et al. (2020) have confirmed that Sri Lankan entrepreneurial engineers are risk takers, similar to typical entrepreneurs. Another respondent highlighted, *"Don't expect to work eight to five in the office. It's very difficult, and at least, in the first ten years, you have to work hard as an entrepreneur"*. Since entrepreneurial journey is not an stress-free task for a person like an engineer who was initially trained to execute engineering, not to run a business, they have to spend additional time to achieve their entrepreneurial goals (Goldberg, 2006). In the initial stage, finance management for survival is very difficult for any entrepreneur (Matusik, 2016). Hence, a respondent has suggested, *"Go into full-time employment immediately if you (fresh graduates) do not have anybody to support you. But then think of ways to quickly coming out of it and setting up either by your own or joining partnerships and establishing entrepreneurship or the business"*. Nowadays, fresh engineering graduates are also willing to initiate tech startups. Most of the time, they lack venture capital and there is no body to support them. In that case, they should immediately find employment to accumulate some financial resources to start their prospective tech firm

in future. Hence, prospective entrepreneurial engineers should prepare to accept challenges and work hard to be successful in the entrepreneurial journey.

4.2. Be an Expert in the Field

Techno-entrepreneurs use technology as a way of generating income (Colovic & Lamotte, 2015). Most of the time, they utilize their expert engineering knowledge to earn money as an entrepreneurial engineer. Another critical occupational advice given by the respondents is to be an expert in the technology domain where he/she is performing as an entrepreneur. As supportive evidence, this advice can be mentioned. *"At first you should learn something industrial and should love some discipline. Then it would help if you become an expert in that. Once you become an expert, you can do something alone as an entrepreneur"*. Interviews have further confirmed that most of the respondents were expert engineers in their work field. They have gained a considerable reputation in the industry as technical experts. Hence, they could use their specialized technical knowledge to give society tech services/products through their firms. Another respondent has emphasized, *"We move from engineering to management without any scientific background. So entrepreneurial engineers should properly learn management"*. Once started up, the entrepreneurial engineer has to look after all the firm's operations, including its overall management (Guardia, 2016). Lack of management knowledge acts as a barrier to that process. Therefore, the entrepreneurial engineer should be an expert in technology and management to run a techno-entrepreneurial firm successfully. Kohlert et al. (2013) have recommended the same for engineers who plan to become entrepreneurial engineers in the society.

4.3. Be Ethical

As per the respondents, any engineer who wants to be a successful tech-entrepreneur should adhere to ethics while running the business. This narrative evidence confirms the above key business advice: *"I always ask entrepreneurial engineers to do an ethical business. Sometimes it may be not easy. You don't get immediate money. But, with time, society will realize, and you will be able to earn money"*. Balancing business goals and ethics simultaneously is difficult in today's competitive business world. However, the entrepreneurial engineer cannot succeed in the business, neglecting ethics (Goldberg, 2006; Guardia, 2016). Another respondent highlighted that *"Actually, entrepreneurial engineers should be honest. That is my main advice. Anybody who starts, they should be honest."* Honesty has been identified as one of the critical ethical traits of entrepreneurial engineers in Sri Lanka (Wijesinghe et al., 2020). As per the respondents' recommendations, following ethics and being honest is vital for entrepreneurial engineers. According to Kohlert et al. (2013), entrepreneurial engineer should act ethically demonstrating passion not for money, but for entrepreneurship. Furthermore, they should maintain a good character without letting unethical actions to damage the character which will affect the success of the business eventually. Literature consist with ample evidences that any entrepreneurial engineer who violates ethics in the business acumen cannot be successful in the long run as an entrepreneur (Uchino, 2010).

4.4. Work for Satisfaction

Satisfaction is a key to being motivated to achieve goals. As per respondents of this study, if any engineer starts a techno-entrepreneurial firm in a technical domain where this engineer is not satisfied by working, such firms will not succeed. A respondent explained this: *"I am always telling that do what you like, so that's what I being followed. As from the inception, in this firm I am doing what I like. That is why even I work hard"*. If there is no satisfaction, nobody is willing to do hard work. This narrative extract further endorses the above advice: *"You can have built a big kingdom which owned by you, but if you are not satisfied, what is the purpose? What is the usefulness of that? Finally, it is the satisfaction"*. To become a successful entrepreneurial engineer, engaging in a business in a preferred area is a must (Goldberg, 2006). The need for achievement is a key personality trait of entrepreneurial engineers (Wijesinghe et al., 2020). Less satisfaction with engaging in the business does not motivate them for more achievements. Literature also highlights that the founders of entrepreneurial firms do satisfy with their business firms while successors are not having that level of satisfaction due to the low level of discretion in decision making (Lauto et al., 2020) Hence, work satisfaction for owners/managers is also essential for the success of the techno-entrepreneurial firms.

5. Conclusions & Implications

This study reveals four key themes of business advice for prospective and emerging techno-entrepreneurial engineers. Accept challenges & work hard, be an expert, be ethical, and work for satisfaction were them. These pieces of business advices will benefit engineering and non-engineering technology entrepreneurs to adopt to succeed in their business journey. Furthermore, this enables more technology entrepreneurs to start and drive their tech-firms to success which will contribute economic development of the country in this crisis situation. Participation of only the male entrepreneurial engineers in the interviews can be identified as a significant limitation of this study as it contributed to making a gender bias conclusion. The result of this qualitative study also cannot be generalized to the whole community of technology entrepreneurs in Sri Lanka. Systematic quantitative studies should be developed to investigate these findings further and generate a generalizable result.

References

- Abdullah, S. (2009). The transformation from entrepreneurship to technology entrepreneurship development in Malaysia. *Journal of Chinese Entrepreneurship*, 1(3), 240–247. <https://doi.org/10.1108/17561390910999524>
- Beckman, C., Eisenhardt, K., Kotha, S., Meyar, A., & Rajagopalan, N. (2012). Technology Entrepreneurship. *Strategic Entrepreneurship Journal*, 6, 89–93. <https://doi.org/10.1002/sej>
- Braun, V., & Clarke, V. (2013). *Successful Qualitative Research-A Practical Guide for Beginners*. Sage Publications, Inc.
- Chell, E. (2008). *The Entrepreneurial Personality: A Social Construction* (2nd Editio). Taylor & Francis Group. <https://doi.org/10.1177/026624268500300304>
- Colovic, A., & Lamotte, O. (2015). Technological Environment and Technology Entrepreneurship: A Cross-Country Analysis. *Creativity and Innovation Management*, 24(4), 617–628. <https://doi.org/10.1111/caim.12133>
- Cresswell, J. W. (2014). *Research Design* (4th Editio). Sage Publications, Inc.
- Dorf, R. C., & Byers, T. H. (2008). *Technology Ventures: From Idea to Enterprise* (2nd Editio, Vol. 53). The McGraw-Hill Companies. <https://doi.org/10.1017/CBO9781107415324.004>
- Fowosire, R. A., Idris, O. Y., & Elijah, O. (2017). Technopreneurship: A View of Technology, Innovations and Entrepreneurship. *Global Journal of Researches in Engineering*, 17(7), 41–46.
- Goldberg, D. E. (2006). *The Entrepreneurial Engineer; Personal, Interpersonal, and Organizational Skills for Engineers in a World of Opportunity*. John Wiley & Sons, Inc.
- Guardia, R. D. La. (2016). *Engineer to Entrepreneur; Success Strategies to Manage Your Career and Start Your Own Firm*. American Society of Civil Engineers.
- Harms, R., & Walsh, S. T. (2015). An Introduction to the Field of Technology Entrepreneurship: Editorial to the Special Issue. *Creativity and Innovation Management*, 24(4), 552–557. <https://doi.org/10.1111/caim.12159>
- Jones-Evans, D. (2006). A typology of technology-based entrepreneurs: A model based on previous occupational background. *International Journal of Entrepreneurial Behavior & Research*, 1(1), 26–46.
- Kohlert, H., Fadai, D., & Sachs, H.-U. (2013). *Entrepreneurship for Engineers* (2nd Editio). Oldenbourg Verlag.

- Lauto, G., Pittino, D., & Visintin, F. (2020). Satisfaction of entrepreneurs: A comparison between founders and family business successors. *Journal of Small Business Management*, 58(3), 474–510. <https://doi.org/10.1080/00472778.2019.1660937>
- Matusik, S. F. (2016). Entrepreneurship, competition, and economic development. *Antitrust Bulletin*, 61(4), 561–563. <https://doi.org/10.1177/0003603X16676142>
- McFadden, C. (n.d.). *25 Richest Engineers in the World*. Retrieved June 9, 2017, from <https://interestingengineering.com/25-richest-engineers-world>
- Pordan, I. (2007). A model of technological entrepreneurship. In F. Therin (Ed.), *Handbook of Research on Techno-Entrepreneurship, Second Edition: How Technology and Entrepreneurship are Shaping the Development of Industries and Companies*. Edward Elgar Publishing Limited.
- Roja, A., & Nastase, M. (2014). TECHNOLOGY ENTREPRENEURSHIP AND ENTREPRENEURIAL STRATEGIES. *The 8th International Management Conference*, 107–117.
- Sekaran, U., & Bougie, R. (2016). *Research Methods for Business; A Skill Building Approach* (7th ed.). John Wiley & Sons Ltd. https://doi.org/10.1007/978-94-007-0753-5_102084
- Uchino, K. (2010). *Entrepreneurship for Engineers* (1st Editio). CRC Press; Taylor & Francis Group.
- Wijesinghe, D. P. S., Jayawardane, V. P. T., & Dasanayake, S. W. S. B. (2020). START-UP STORIES OF TECHNO-ENTREPRENEURIAL ENGINEERS IN SRI LANKA. *3rd International Conference on Business Research*, 188–198. <http://dl.lib.mrt.ac.lk/handle/123/16141>
- Wijesinghe, P., Jayawardana, T., & Dasanayaka, S. (2020). Personality Traits of Techno-Entrepreneurial Engineers in Sri Lanka. *Moratuwa Engineering Research Conference (MERCon) 2020*, 482–487. <https://doi.org/10.1109/mercon50084.2020.9185246>