

LITERATURE REVIEW STUDY: ANALYSIS OF THE ROLE AND OPPORTUNITIES OF TECHNOPRENEURSHIP IN INDONESIA**Siti Putri Luthfiyyah^{1*}, Ritha F. Dalimunthe²**^{1,2}Ilmu Manajemen, Universitas Sumatera Utara, Indonesia¹sitiputriluthfiyyah@gmail.com**Abstract**

Technopreneurship is utilized by business people in all fields. Fields that usually utilize technopreneurship include education, pharmacy, hotels, and so on. Technopreneurship is actually not a product, but a synthesis of the future of a person, organization, nation and world. Therefore, a directional strategy and selection process is needed the right decisions in critical and complex times. This requires the help of universities and professional development programs. This research uses a literature review method, A research through comprehensive research and interpretation of literature related to a particular topic, which includes identifying research questions by searching and analyzing relevant literature using a systematic approach to carry out simplified data analysis. The results of this research show that there is a strong and positive relationship between technopreneurship and company growth. Indonesia needs it continue to develop the spirit of technopreneurship to support the economy. There is a strong positive relationship between technopreneurship and the growth of entrepreneurship. Enhancement The number of technopreneurs will increase business growth as a direct impact of expertise and skills possessed by entrepreneurs.

Keywords : Technopreneurship, Technology, Dan Entrepreneur

1. Introduction

In recent years, we have often encountered and heard the term technopreneurship in various media, both print and electronic media. In English, Technopreneurship comes from two words, namely "technology" and "entrepreneurship". In general, the word technology is used to refer to the practical application of science in the industrial world or as a knowledge framework used to create tools, to develop competencies and skills to solve existing problems. Meanwhile, the word entrepreneurship comes from the word entrepreneur which refers to a person or agent who creates a business/enterprise with the courage to take risks and strives to achieve profits and growth by identifying existing opportunities (Zimmerer & Scarborough, 2008). After having technological competence and an entrepreneurial spirit, the last thing that needs to be done is to integrate them to

support the business development unit. Creativity and proper use of technology are the main things in developing a technopreneurship spirit.

The term technopreneurship only emerged at the end of the 1990s and began to experience a boom in the 2000s, since technology has developed to date, coupled with the existence of operational companies based on IT (information technology). This condition illustrates that organizations that want to achieve sustainable competitive advantage are organizations that are based on mastering technology and using technology as the driving force of their organization. Basically, business development in the technology sector is largely the result of synergy between technopreneurs who generally participate with various research centers, with the provision of capital that will be used in business. Currently we have entered the era of Industrial Revolution 4.0 where the increasing use of computer devices that can replace human labor is one of the characteristics of Industrial Revolution 4.0

Industry 4.0 emerged from the idea of the fourth industrial revolution where technology has become the basis for social activities. All processes and activities in this era are carried out using an automatic system, where the development of internet technology is increasingly developing, not only connecting people throughout the world but also becoming a basis for the process of economic trade transactions. Based on analysis by the McKinsey Global Institute (2017), it is stated that the Industrial Revolution 4.0 has had a major influence on the employment sector. It is estimated that as many as 375 million workers worldwide will need to move into new job categories and learn new skills, so the adoption of automation will be rapid. If their transition to new jobs is slow, poverty rates will increase.

As we all know, the real challenges facing Indonesia to date are the issue of unemployment and the competitiveness of human resources as well as the demands of companies and industry. Therefore, in every activity and process, every company and industry and the resources within it really have to develop their potential as much as possible by increasing creativity and innovation because superior and productive human resources are the main players in facing the challenges of the Industrial Revolution 4.0.

Globalization, technological innovation and intense competition in the era of industrial revolution 4.0 are forcing companies to change the way they run their business. In order to survive, companies are changing from resource-based business to knowledge-based business, with the main characteristics of knowledge. When the company's main achievement is sustainable competitive advantage or achieving sustainable business competitiveness, then company management will be encouraged in the process of achieving and developing knowledge as the company's competitive strategy. Competitiveness is also driven by increasingly sophisticated and rapid technological developments, lagging behind in mastery of technology will

have an impact on the difficulty of winning the competition, whether at the country or organizational level. According to (Ritha F. Dalimunthe, et.all; 2022), millennials prefer to work with high technology and innovate knowledge that can be obtained from their environment, and feel challenged by a work environment that involves creativity and change. Competition between countries is characterized by an increase in the scale of production that can be produced, direct investment coming from abroad and an increase in people's living standards. Referring to the results of the Word Economic Forum (WEF) meeting, the country's competitive advantage is generated by two main factors, namely competitiveness in growth and competitiveness in its microeconomy.

Basically, this competitive advantage is produced by factors of technological mastery, the role of public institutions and macroeconomic resources. Competitiveness like this is decreasing for Indonesia, the role of national products produced by the role of high technology is still quite low, Indonesian production is still dominated by low and medium technology products, the consequence is that Indonesia has quite difficulty in gaining a competitive advantage, because its technological capabilities are still low. In other words, the most feasible effort to put forward is how to improve technological mastery to increase competitiveness, both at the organizational and country levels.

Implementing the technopreneurship concept is one step to achieve excellence during the current post-pandemic industrial revolution 4.0. The future business perspective must be built from the foundation of mastery of technology, where there must be synergy between mastery of technology and development capacity, then technology is transformed into a basis for business. With the birth of digital technology today, the industrial revolution 4.0 has an impact on human life throughout the world. Industrial Revolution 4.0, all processes are carried out using an automated system in all activity processes, where the development of internet technology is increasingly developing, not only connecting people all over the world but also becoming a basis for online trade and transportation transaction processes.

Everything related to the internet and the digital world also has an impact on people's purchasing behavior and the world of marketing. Marketing and payment trends in the world are shifting from conventional (offline) to completely digital (online). Digital marketing and transactions are more prospective because they allow potential customers to obtain all kinds of information about products and make transactions without having to meet, namely via the internet. Changes in people's behavioral patterns and lifestyles during the Covid-19 pandemic have given rise to new habits (New Normal), including people's shopping trends. With the current pandemic conditions, sellers and brand owners are required to develop their businesses through online media. Of course, this coincides with the government's

policy regarding social distancing, making people tend to choose online shopping to meet their daily needs. This is a challenge and demand for business actors to increase their competitive abilities to provide creativity and innovation for the development of technology-based entrepreneurship skills (technopreneurship).

2. Literature Review

a. Entrepreneurship

In simple terms, the meaning of an entrepreneur is a person who has the courage to take risks to open a business on various occasions. Having the courage to take risks means having an independent mentality and having the courage to start a business, without being overwhelmed by fear or anxiety even in uncertain conditions. Entrepreneurial activities can be carried out alone or in groups. An entrepreneur in his mind always tries to find, exploit and create possible business opportunities provide benefits. The risk of loss is normal because they adhere to the principle that the loss factor must exist. Entrepreneurship also always results in producing something new in that business. The new things produced are not only in the form of new types of goods, but can also be systems, methods, business strategies and other business aspects in order to realize work efficiency and effectiveness. An entrepreneur is not a molded human being but someone who has outstanding personal qualities that are visible from the underlying attitudes, motivations and behavior.

b. Technology

Technology is a whole means of providing goods necessary for the continuity and comfort of human life. The use of technology by humans begins with converting natural resources into simple tools. The prehistoric discovery of the ability to control fire has increased the availability of food sources, while the creation of the wheel has helped humans travel, and control their environment. Recent technological developments, including the printing press, telephone, and Internet, have reduced physical barriers to communication and allowed humans to interact freely on a global scale. However, not all technology is used for its purpose peace. The development of increasingly powerful weapons of destruction has taken place throughout history, from clubs to nuclear weapons. Technology is the result of human thought to develop certain procedures or systems and use them to solve problems in their lives. For example, a child who is far away from people Parents can convey messages of longing for them by sending messages via letter, SMS, telegram, telephone, or sending emails via the internet. So, the child has actually used technology in information and communication.

c. Technopreneurship

The word "Technopreneurship" is a combination from the words "Technology" and "Entrepreneurship". can be concluded as a process of formation and collaboration between business fields and the application of technology as a supporting instrument and as the basis of the business itself, both in processes, systems, parties involved, as well as the products produced. In general, The word Technology is used to refer to implementation practical science to the industrial world or as knowledge framework used for create tools, to develop skills and extracting material to solve problems which exists. Meanwhile, the word entrepreneurship comes from The word entrepreneur refers to a person or agent who creates a business/enterprise with courage bear the risks and uncertainties to achieve profit and growth by identifying identify existing opportunities. As for technopreneurs is a person who carries out technopreneurship or someone who runs a business who owns entrepreneurial spirit by marketing and utilizing technology as a selling point. Another definition of technopreneurship is integration of entrepreneurship with technology is a form of technopreneurship (Depositario, et.all., 2011). According to Hartono (2011) states that Technopreneurship is a collaboration between application of technology as an instrument and the soul of business independence as a necessity. Technopreneurship is an integral character between application competence technology and the spirit of building a business. To be a technopreneur we can also contribute improve the standard of living of the Indonesian people by generate employment and development Indonesian economy and technology.

3. Methodology

The research methodology used in the research is a systematic literature review (SLR), according to Snyder (2019: 333), a literature review is a research methodology that aims to collect and extract the essence of previous research and analyze several expert summaries written in the text. A research through comprehensive research and interpretation of literature related to a particular topic, which includes identifying research questions by searching and analyzing relevant literature using a systematic approach to carry out simplified data analysis. The articles used are specific to original empirical research articles or research articles containing the results of actual observations or experiments where there is an abstract, introduction, methods, results and discussion of the research. The article search strategy uses databases available on Google Scholar and Mendeley. Key words in finding articles are technopreneurship, technology, and entrepreneurship n. The data search used the criteria for literature review materials, namely: Randomized Controlled Trials (RCT) research design articles, Experimental research, Original articles from primary sources, Full text articles in English and Indonesian.

Article searches use several sources from databases available on Proquest, Google Scholar and Research Get. The stages taken in the simplified approach analysis include summarizing each literature. Critical appraisal/critical review is carried out simultaneously to determine the strengths and weaknesses of the literature and to see the relationship between one literature and other literature, identifying themes from the results of each research in the literature where the resulting themes must be reflecting research questions from the literature review, developing themes by combining all the same themes, discussing the strength of the findings by considering research results with stronger evidence or weak evidence by carrying out critical appraisal in the first step, naming each theme by considering appropriate naming in the first step. each theme by understanding the literature so that the name of the theme is closer to the results of research in the literature, comparing and reviewing each theme by checking two things, namely: each theme has got the right name, and collecting the themes into one correct theme, monitoring strictly focus on the similarities and differences of each theme, then analyze in depth and consider how each theme can be related to each other, review the critical appraisal of each literature so that you can assess whether the existing themes can answer each research question.

4. Results and Discussion

The following are search results from a literature review of eleven articles collected by researchers

Table. 1 Data Analysis Matrix in Articles

Researcher	Title	Method	Research Result
Ramel Yanuarda RE, et.al (2023)	The Misconceptions On MSE Research In an Emerging Market Economy: The Role Of Household Interference In Indonesia	Quantitative: Panel Data	The results show that household interactions in the use of unpaid workers, direct consumption of business revenue, and use of home facilities as a place of business are found in most MSEs in developing countries, affecting the returns on micro-businesses. This is evidence that the existence of MSEs is more than a compulsion

			to meet the needs of household life than an entrepreneurial motivation driven by innovative, proactive, and risk-taking attitudes. Seeing the role of MSEs based solely on their entrepreneurship activities and classifying them based on business scales leads to a debate that is getting further away from the urgency of the existence of MSEs
Eko Nurmianto (2017)	Empowering in Coastal Communities Using Ergonomics and Technopreneurship Methods	Qualitative: Phenomenology	Every community wants their business to be successful and able to last a long time. Problems of coastal community are lack of skill and income Empowerment objectives 1) Determining the level of needs of coastal communities, 2) Determining the type of skills required, 3) Determining appropriate training packages to improve skills. Based on this goal, the result of empowerment is how to improve the skills and income of coastal

			communities. As people's income increases, it is expected that the volume of activities and commodity trading will also increase. This empowerment provides a plan to improve the standard of living for coastal communities and their families. This activity is in accordance with SDG 8 (Decent Work and Economic Growth.
Yasinta Indrianti (2023)	It Takes Two to Tango: Roles of Digital Strategy and Human Creativity in Creating Transformational Technopreneurship	Quantitative: Linear Regression	The results demonstrated that digital strategy and human creativity significantly influence the formation of technopreneurship transformation in startups. From the Path Coefficient value obtained, it means that the greater the digital strategy and human creativity owned by the startup, the higher the technopreneurship transformation.
Era Febriana Aqidawati (2020)	The Role of Technopreneurship and Innovation System for Commercializing Battery Technology:	Qualitative: Descriptive	The analysis was conducted by referring to the technopreneurship and innovation system approach to

	A Comparative Analysis in Indonesia		understanding the process of innovation management at the relevant technology transfer offices (TTO) and how the technopreneurship model is applied. The paper provides an insight into how technology transfer offices (TTOs) organize and manage innovation activities with the technopreneurship model and how the constraints of technology commercialization on battery technology innovations.
Hendra Hidayat (2018)	Designing of Technopreneurship Scientific Learning Framework in Vocational-based Higher Education in Indonesia	Quantitative: Four D Model (4-D model)	The results elaborate that thetechopreneurship scientific learning model is as an alterna@tive to producing well- prepared graduates for survival in the society by applying the entrepreneurship skills- based technology.
Alexander Harsono (2015)	Building Technorpreneurship For Next Generation How The Benefits Of Technorpreneurship	Quantitative: Frequency Accounts	The findings of this research show that the benefits of techno- entrepreneurship education significantly affect be

Education Affect
Career Intentions Of
College Students

technopreneurial
generally and it helps
students determine how
well suited they are for
technopreneurship. The
impact and effects of
entrepreneurship
education has not kept
pace with the growth
of teaching capacity
while there is a positive
impact of
technopreneurship
education courses at
college on perceived
attractiveness and
perceived feasibility of
new venture initiation.
Techno-
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with advancing
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knowledge base, the
achievement of skills,
competences,
motivation, creativity,
innovation, and
attitudes on which

			future career intentions are based. The literature review done had provided some indications about significant and positive link between technopreneuship education and subsequent technopreneurial activities.
Maruff Akinwale Oladejo (2022)	Technopreneurship Engagement: The Behavioral Intentions of Nigerian and Indonesian Undergraduates in an Emerging Society 5.0	Quantitative: Multiple Regression	Findings showed that the joint contributions of e-ASK to the variance in technopreneurship engagement were 5.5%. There was also significant dif@ference in behavioral intentions to technopreneurship engagement among Nigerian and Indonesian Undergraduates ((t=-2.376; df=334, p<.05). In broad term, this study investigated the behavioral intentions of Nigerian and Indonesian undergraduates towards technopreneur@ship engagement in an emerging society 5.0. Specifically, the objectives of the study are to: 1) determine the

			joint contributions of entre@preneurship attitudinal, entre-preneurship skills, entrepreneurship knowledge (e-ASK) in predicting the behavioral intentions for techno@preneurship engagement.
Yusi Tyroni Mursityo (2017)	Technopreneurship Intentions In Faculty Of Computer Science Brawijaya University Students	Quantitative: Sem-Pls Analysis	Further analysis arising from desirability and feasibility reveals that is fully mediated with Cre@tivity and Technopreneurship Intentions. Overall, these findings offer empirical evidence on the importance of desirability and feasibility of the relationship between Creativity and Technopreneurship Intentions.
Hendra Hidayat, et.al (2019)	Implementation of Technopreneurship Scientific Learning for Produce Electronic Product Prototypes in Engineering Education	Qualitative: Development Approach	The measurement results from the implementation in the field show that electronic products have worked well and after the measurements are made, students make a business plan of the product, which is a water detector. A business plan that has been made has been

			through consumer needs analysis
Boy Yendra Tamin,et al (2019)	The Contribution Of Technopreneurship Scientific Learning And Learning Readiness Towards Entrepreneurship Learning Outcomes In Higher Vocational Education	Quantitative: Correlation Descriptive	The research findings show that there is a contribution of both technopreneurship scientific learning and learning readiness to entrepreneurship learning outcomes.
Farida Rohmah,et.all (2019)	Technopreneurship As A Strategy For UKM Empowerment In Global Market Competitiveness During The Covid 19 Pandemic	Qualitative: Descriptive	Based on the research results, the potential and role of the Village Government is very large for the development of SMEs with strategies implemented through Capacity Building and Technopreneur. This provides opportunities for SMEs who have limitations in maintaining their business in facing the global market.

Technopreneurship is a latent concept that is at the core of various fundamental subjects. Various literature uses various terms such as “technology-based entrepreneur” (technology-based entrepreneur), “technical entrepreneur” (technical entrepreneur), “high-tech entrepreneur” (entrepreneur using high technology), or even “high-tech new business” (new business). which relies on high-level technology). All the terms mentioned above basically refer to new businesses that combine entrepreneurial skills and technology (Koe, 2020). Entrepreneurs who enter the core world of business should take advantage of technology-based industries to produce innovative products. This can be done through a commercialization process by technopreneurs. This business has high potential. However, adequate knowledge

and skills are required. Technopreneurs must be equipped with business and technical skills. In general, technopreneurs have knowledge that comes from skills that are relevant to the business. These skills include knowledge of data and experience in the financial sector. Another thing that is no less important is the technological capabilities associated with entrepreneurship (Nurhayati & Machmud, 2019). There is a strong and positive relationship between technopreneurship and company growth. Indonesia needs to continue to develop the spirit of technopreneurship to support the economy (Kusharsanto & Pradita, 2016). Technopreneurship should still pay attention to environmental factors. This is called technology ecopreneurship. This type of entrepreneur should pay attention to the balance of environmental factors. The business and industry carried out should be environmentally friendly. The most up-to-date technology is required. However, these efforts must still pay attention to efforts to protect and maintain the environment (Nacu & Avasilc, 2014). Technopreneurship will be placed on a development path where the relationship between micro and macro factors bridges opportunities in the fields of technology and entrepreneurship. Technopreneurship is very important among young people who want to continue to develop. In a company, there is a system of internal entrepreneurial processes and strategic capabilities to identify and create opportunities. Existing opportunities are developed so that added value and business innovation will be created. Opportunities must be pursued and investment deployed to increase competitiveness. Knowledge of management will increase the ability to attract consumers. Changes that continue to occur can be overcome in business innovation. Business is dynamic, therefore sustainable conservation is needed to increase competitiveness in the local and international environment (Koe et al., 2021).

5. Conclusion

Technopreneurship is utilized by business people in all fields. Fields that usually utilize technopreneurship include education, pharmacy, hotels, and so on. Technopreneurship is actually not a product, but a synthesis of the future of a person, organization, nation and world. Therefore, a directional strategy and selection process is needed the right decisions in critical and complex times. This requires the help of universities and professional development programs. Training is also needed to produce thinkers who have expertise in the rapidly changing global world these days. The use of technopreneurship greatly increases global competitiveness in the business world. With Thus, technopreneurship is very important to master and study well in order to create mutual progress in the world of global competition.

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