The mediating effect of technology application in enhancing the weakness of market access, financial resources and supplier resources throughout bumiputera entreprenuers aluminium success.

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Research Project Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

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DECLARATION

I hereby declare that the case study is based on my original work except for quotations and citations that have been duly acknowledged. I also declare it has not been previously or concurrently submitted for any other degree at University Tun Abdul Razak (UNIRAZAK) or other institution.

Signature:

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Date: 31st May 2023

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ABSTRACT

Abstract of the project paper submitted to the Senate of Universiti Tun Abdul Razak in partial fulfilment of the requirements for the Master of Business Administration

The mediating effect of technology application in enhancing the weakness of market, finance and supplier resources throughout bumiputera entreprenuers aluminium success.

By

Mohamad Shahhalmi Mohamad Salleh

This study aims to investigate the mediating effect of technology application in enhancing the weakness of market access, financial resources, and supplier resources for Bumiputera entrepreneurs' success in the aluminium industry. Bumiputera entrepreneurs face numerous challenges related to market access, limited financial resources, and inadequate supplier networks, which can hinder their business growth and success. This research proposes that technology application plays a crucial role in mediating these weaknesses, enabling Bumiputera entrepreneurs to overcome barriers and achieve sustainable success in the aluminium industry. By leveraging technology, entrepreneurs can enhance market access, optimize financial resource utilization, and establish robust supplier networks. The population of the sample was on the participants in the course of aluminium product at Furniture Industry Technology (FITEC) Sdn Bhd, Selangor. It comes out of 75 respondents based on PLS-SEM model to study the relationship and impact of market access, financial resources supplier resources and technology application on the economic development. Based on ten (10) hypotheses, there were only six (6) were accepted and the four (4) of hypotheses were rejected. These impact by the high cases of pandemic Covid-19 recently on 2019.The findings of this study contribute to the academic literature by highlighting the importance of technology in facilitating the success of Bumiputera entrepreneurs in the aluminium sector.

CHAPTER 1: INTRODUCTION

1.1 Research Background

According to a report by the Ministry of International Trade and Industry (MITI) in Malaysia, Bumiputera entrepreneurs face a number of challenges in the aluminium industry, including limited access to financing, lack of market intelligence, and limited technical expertise (MITI, 2018). As a result, these entrepreneurs may lack the resources and knowledge needed to effectively navigate the complex business environment of the industry and succeed (MITI, 2018). To address these challenges, various initiatives and programs have been implemented by the government to enhance the capacity of bumiputera entrepreneurs in the aluminium industry, including training and development programs, access to financing and loans, and other forms of support.

One such initiative is the Bumiputera Entrepreneur Development Fund (BPEDF), which provides financing and other forms of support to bumiputera entrepreneurs in the industry (MITI, 2020). In addition, there is an increasing focus on the development of digital capabilities and technologies, which can enable bumiputera entrepreneurs to overcome many of the challenges they face in the industry (Mokhtar and Osman, 2018). For example, digital platforms can provide access to market intelligence and business support services, while advanced manufacturing technologies can improve the efficiency and competitiveness of operations. Recent research suggests that there is a strong need for continued investment in the development of bumiputera entrepreneurs in the aluminium industry (Mohamed and Azman, 2019). This includes the need for tailored training and development programs that address specific challenges faced by these entrepreneurs, as well as increased access to financing and other forms of support (Azman and Ismail, 2019).

Next, according to a report by Grand View Research, the global aluminium market is expected to grow at a compound annual growth rate (CAGR) of 5.9% from 2020 to 2027. This growth is being driven in part by increased demand for aluminium in the automotive, aerospace, and construction industries, among others. In Malaysia, the aluminium industry has been identified as a key sector for economic growth, and the government has implemented a number of initiatives to support the development of bumiputera entrepreneurs in the industry (Mahmud and Abdul Rahman, 2020).

1.2 Problem Statement

One important factor in the success of bumiputera entrepreneurs in the aluminium industry is market access (Nor et al. 2019). This includes understanding market trends and consumer needs, as well as having the resources and capabilities to effectively compete in the industry. According to a report by the Ministry of International Trade and Industry (MITI) in Malaysia, successful bumiputera entrepreneurs in the industry have focused on product differentiation, quality, and cost-effectiveness. To support market access for bumiputera entrepreneurs in the aluminium industry, various initiatives and programs have been implemented by the government, including market intelligence and business matching services, as well as trade and investment missions to targeted countries. Recent research suggests that there is a need for continued investment in the development of marketing capabilities for bumiputera entrepreneurs in the industry. This includes the need for tailored training and development programs that address specific marketing challenges faced by these entrepreneurs, as well as increased access to market intelligence and business support services (Ismail and Mohd Nawi, 2018).

Access to finance is one of the key challenges faced by bumiputera entrepreneurs in the aluminium industry in Malaysia (Yunus et al. 2019). According to a report by the Ministry of International Trade and Industry (MITI), limited access to financing is a key constraint for the growth and development of these small and medium-sized enterprises (SMEs). The report notes that traditional sources of financing, such as bank loans, may be difficult for bumiputera entrepreneurs to secure due to factors such as lack of collateral or financial track record. To address this issue, various initiatives and programs have been implemented to support the access of bumiputera entrepreneurs to financing. Bumiputera entrepreneurs in the Malaysian aluminium industry face challenges related to accessing finance, acquiring resources and accessing markets of financial planning skills (Abdul Rahman et al. 2019).

Last but not least, the weaknesses faced by Bumiputera entrepreneurs in the aluminium industry is the limited availability of supplier resources (Jusoh and Daud, 2017). Some of the key challenges faced by Bumiputera entrepreneurs in this regard include limited access to raw materials (Nordin and Ahmad, 2019). Bumiputera entrepreneurs face difficulty in obtaining access to key raw materials necessary for aluminium production (Zainal et al. 2019). Other than that, it is because of limited technical capabilities (Aziz et al. 2020). Some Bumiputera entrepreneurs lack the technical expertise required to effectively evaluate their suppliers and identify the most suitable suppliers for their business (Sorooshian et al. 2019). Next is limited

production capacity. It is because due to limited resources, some Bumiputera entrepreneurs may be unable to produce sufficient quantities of aluminium products to meet demand or to compete effectively with larger firms in the industry (Noor and Harun, 2017). Another research said that limited transportation options (Rezai et al. 2019). Bumiputera entrepreneurs may face difficulty in transporting raw materials and finished products due to a lack of available transportation options (Rezai et al. 2019). Overall, the limited availability of supplier resources can pose a significant challenge for Bumiputera entrepreneurs in the aluminium industry, impacting their competitiveness and growth in the industry (Abdul and Yusof, 2018).

1.3 Research Objectives

RO1: To examine the relationship between market access and economic development among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO2: To examine the relationship between financial resources and economic development among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO3: To examine the relationship between supplier resources and economic development among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO4: To examine the relationship between market access and technology application among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO5: To examine the relationship between financial resources and technology application among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO6: To examine the relationship between supplier resources and technology application among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO7: To examine the relationship between technology application and economic development among bumiputera entrepreneurs in the Malaysian aluminium industry.

RO8: To examine the mediating effect of technology application in the relationship between market access and economic development.

RO9: To examine the mediating effect of technology application in the relationship between financial resources and economic development.

RO10: To examine the mediating effect of technology application in the relationship between supplier resources and economic development.

1.4 Research Questions

RQ1: To what extend does market access have a relationship with economic development in the Malaysian aluminium industry?

RQ2: To what extend does financial resources have a relationship with economic development in the Malaysian aluminium industry?

RQ3: To what extend does supplier resources have a relationship with economic development in the Malaysian aluminium industry?

RQ4: To what extend does market access have a relationship with technology application in the Malaysian aluminium industry?

RQ5: To what extend does financial resources have a relationship with technology application in the Malaysian aluminium industry?

RQ6: To what extend does supplier resources have a relationship with technology application in the Malaysian aluminium industry?

RQ7: To what extend does technology application have a relationship with economic development in the Malaysian aluminium industry?

RQ8: Does the technology application has mediating effect on the relationship between market access and economic development?

RQ9: Does the technology application has mediating effect on the relationship between financial resources and economic development?

RQ10: Does the technology application has mediating effect on the relationship between supplier resources and economic development?

1.5 Scope and the limitation of Study

The study focuses specifically on Bumiputera entrepreneurs in the aluminium industry in Malaysia, examining their challenges and opportunities. This research involved in conducting interviews or surveys with Bumiputera entrepreneurs in the industry, as well as other stakeholders such as suppliers, industry associations, and government agencies. The study also examines relevant policies and programs that could help address the challenges faced by Bumiputera entrepreneurs in the industry. The interviews will approach to different

Bumiputera entrepreneurs to provide appropriate information concerning the factors influencing the success of Bumiputera entrepreneurs in Malaysia's aluminium industry. This research will only involve a population of 100 Bumiputera entrepreneurs where a sample of participants will be used to collect data analysis. A sample of 3 participants will be selected from the population of 100 entrepreneurs to carry on with the research. From the selected sample of 3 participants, different categories of individuals will be selected in terms of the types of aluminium works, opportunities and challenges and other related factors. There are some limitations of the study may rely on a small sample size, particularly if it is challenging to recruit participants for interviews or surveys.

Next, there may be limitations in accessing data on Bumiputera entrepreneurs in the aluminium industry, particularly if the industry is not well-documented or if data is not readily available. Cultural and language barriers may pose a challenge when conducting interviews or surveys with Bumiputera entrepreneurs, particularly if the researchers are not familiar with the cultural context in Malaysia. Lastly, the study may only identify challenges and opportunities from the perspective of Bumiputera entrepreneurs in the aluminium industry, and other stakeholders in the industry may have different perspectives that are not captured in the study. These scope and limitations should be considered when conducting a study on Bumiputera entrepreneurs in the aluminium industry in Malaysia to ensure that the research is effective and valid.

1.6 Significance of the Study

The significance of this study lies in its examination of potential mediating factors that can enhance the success of Bumiputera entrepreneurs in the aluminium industry in Malaysia. Specifically, the study focuses on the role of technology application in addressing the weaknesses of market access, finance, and supplier resources that these entrepreneurs commonly face. By exploring this relationship, the study provides a deeper understanding of the factors that contribute to the success of Bumiputera entrepreneurs in this industry, and also highlights the potential benefits of technology adoption in improving their performance (Yunus and Othman, 2019). This study has significant implications as it extends the current body of knowledge on the challenges and success factors of Bumiputera entrepreneurs in the aluminium industry by highlighting the potential mediating effect of technology application (Noraini et al. 2018).

Moreover, it provides insights into effective strategies that policymakers and industry stakeholders can adopt to support the development of these entrepreneurs, and to foster growth

and competitiveness in the industry overall (Mahmud and Abdul Rahman, 2020). Overall, this study contributes to a deeper understanding of the factors that underpin the success of Bumiputera entrepreneurs in the aluminium industry in Malaysia, and may inspire future research in this area.

Overall, the study addresses an important issue in the aluminium industry and provides valuable insights for researchers, policymakers, and industry stakeholders on ways to support Bumiputera entrepreneurs and enhance their success in the industry.

1.7 Operational Definitions

Market access refers to the set of conditions and regulations that govern the ability of firms to enter, operate and compete in a given market (Luan and Li, 2019). It includes policies related to trade, investment, customs and tariff barriers, intellectual property rights, standards and regulations, and other market entry requirements Luan and Li, 2019). It determines the extent to which firms can compete effectively in both domestic and international markets. For example, if a market is partially protected through tariff barriers and other restrictions, foreign firms may face higher costs to enter the market and may have to compete with domestic firms that enjoy the advantage of lower costs (Johnson, 2019). Therefore, market access is an important consideration for firms when investing in new markets or selling goods and services across borders. It also affects consumers, as barriers to market access can limit consumer choice and raise prices for imported goods and services.

Financial resources refer to the funds and assets that are available to an individual, organization, or government entity to meet its financial obligations and pursue financial goals (Bannister and Newman, 2017). Financial resources include cash, savings, investments, loans, grants, and other sources of funds that can be used to make transactions or investments. The financial resources is important in financial management, as it helps assess an entity's financial health and capability to make financial decisions (UN, 2015). In addition, the availability and allocation of financial resources can have significant economic and social impacts, affecting income distribution, employment, and economic growth.

Supplier Resources refers to the materials, goods, equipment, services, and other resources that are provided by suppliers to a company or organization to support its operations (Lee, 1992). Supplier resources include both tangible and intangible assets, such as raw materials, parts, components, technological expertise, and human resources (Lee, 1992). It is also important in supply chain management, as it helps ensure that the right resources are available

at the right time and place to meet production or service delivery requirements (Ellram, 1996). Effective management of supplier resources can improve the efficiency, quality, and cost-effectiveness of business operations, while also building strong relationships with suppliers.

Technology application refers to the use of technology to perform specific tasks or meet specific needs in a given context (Eurostat, 2017). Technology application can include software, hardware, and digital tools, as well as the associated skills and knowledge required to operate and leverage them (Wu et al. 2018). Technology application is important for both businesses and individuals, particularly in the context of digital transformation and the increasing pervasiveness of technology in everyday life. Effective technology application can improve productivity, efficiency, and innovation across a range of industries and sectors, while also posing new challenges related to issues such as privacy, security, and access (Lee and Kim, 2015).

Economic development refers to the set of policies, programs, and processes that aim to improve the economic well-being and opportunities of individuals and communities over time (World Bank, 2015). Economic development can include various activities such as increasing employment and income levels, expanding access to education and healthcare, promoting entrepreneurship and innovation, and improving infrastructure and public services (Kuznets, 1971). An economic development is key in understanding policies and programs that promote industrialization and poverty reduction. It helps guide the planning, implementation, and evaluation of economic development initiatives, and can also help identify areas for further investment and improvement (Kuznets, 1971).

1.8 **Organization of Chapters**

The proposed of the research shall be structured by five chapters.

The first chapter shall be cover by introduction which including problem statement, research objectives, hypotheses, the importance of the research and the limitation of the research.

The second chapter shall cover the literature review of the theories with the supporting of research variables. It will also cover the research intention by empirical view and presentation of conceptual framework.

The third chapter will present by research methodology and philosophy.

The fourth chapter will discuss about the data analysis results and the discussion of findings.

The fifth chapter as the last one will be present the research synopsis, conclusion and recommendation.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The success of Bumiputera entrepreneurs in the aluminium industry in Malaysia is influenced by a range of factors, including access to market, financial resources, and supplier resources. However, recent research suggests that the application of technology may have a moderating effect on the impact of these factors on the success of these entrepreneurs. There is research examined the financing options and factors affecting the success of Bumiputera entrepreneurs in Malaysia. It found that access to financing was a key determinant of success, but noted that the use of technology platforms such as crowdfunding and peer-to-peer lending could help to overcome some of the challenges faced by these entrepreneurs by (Mohd Saleh and Amran, 2020). Similarly, a study by highlighted the potential of Industry 4.0 technologies to empower Bumiputera entrepreneurs in the aluminium industry (Khairuddin, 2018). It was an argument that technologies such as additive manufacturing, robotics, and the Internet of Things could help to improve productivity and efficiency, as well as enhance the ability of these entrepreneurs to compete in the global market. Another study investigated the role of the Malaysian government's initiatives in supporting Bumiputera SMEs. It found that digital technologies such as e-commerce and digital marketing could help to improve the access of Bumiputera entrepreneurs to the global market, as well as enhance their competitiveness by (Zulfakar et al. 2019). More recent research suggests that the use of digital technologies may be particularly important for supporting access to market resources for Bumiputera entrepreneurs in the aluminium industry. For example, the use of e-commerce platforms was positively associated with the export performance of small and medium-sized enterprises in Malaysia (Azam, 2021). Overall, the literature suggests that the application of technology may offer a potential solution for enhancing the impact of market, finance, and supplier resources on the success of bumiputera aluminium entrepreneurs. However, more research is needed to explore the specific ways in which technology can be leveraged to support the growth and development of these entrepreneurs.

2.2 Research Variables

2.2.1 Market Access

One of the variables of market is market access. This refers to the total value or volume of aluminium products demanded by various industries in Malaysia. Bumiputera entrepreneurs can tap into this market by offering competitive pricing, quality products, and superior customer service (Hassan et al. 2018). The factors contributing to the success of Bumiputera-owned SMEs in the aluminium industry, including the role of market access in enhancing their competitiveness and profitability (Ismail et al. 2018). The study suggests that access to new markets and customer segments is critical to the success of Bumiputera-owned SMEs in the aluminum industry and identifies several strategies such as export promotion, strategic alliances, and online marketing to enhance their market access. The use of 3D printing, for example, can help to reduce waste and enhance precision in manufacturing (Khalid et al. 2019). Then, the government policies, Bumiputera entrepreneurs can benefit from various government incentives and programmes that support their growth and development in the aluminium industry. For instance, the Bumiputera Entrepreneurship Enhancement Programme provides training, funding, and mentoring to eligible entrepreneurs (Osman et al. 2018). Lastly, a competitive landscape. The aluminium industry is highly competitive, with many established players competing for market share. Bumiputera entrepreneurs can differentiate themselves by focusing on niche markets, such as eco-friendly products or custom-made designs (Arzmi and Kamaruddin, 2019).

2.2.2 Financial Resources

There are some financial perspectives that need to cautious. One of the resources of financial is capital expenditure. This refers to the amount of money spent on equipment, machinery, and other physical assets required to manufacture aluminium products. Bumiputera entrepreneurs can minimize their capital expenditure by leasing or renting equipment, rather than purchasing them outright (Othman, 2018). After that is the calculation of profit margin. This represents the difference between the selling price and the cost of producing aluminium products. Bumiputera entrepreneurs can improve their profit margin by reducing their costs through efficient production processes and negotiating better deals with suppliers (Puspitasari and Hardika, 2019). The crucial part is financial management. Bumiputera entrepreneurs must manage their finances effectively to sustain and grow their businesses. They should have a comprehensive financial plan that includes budgeting, forecasting, and cash flow management

(Abdul Rahman et al. 2019). The important last is access to capital: Bumiputera entrepreneurs may face challenges in accessing capital to finance their aluminium ventures. They should explore various financing options, such as government grants, bank loans, and crowdfunding, to secure the necessary funds (Norhidayah et al. 2019).

2.2.3 Supplier Resources

Supplier resources means that the aspects of raw materials availability, supplier relationship, supplier diversity and strategic sourcing. Bumiputera entrepreneurs need to ensure a consistent supply of quality raw materials for their aluminium products. They can seek reliable suppliers who can offer them competitive prices and timely delivery of materials (Ong et al. 2018). Bumiputera entrepreneurs must build strong relationships with their suppliers to ensure a steady and reliable supply of raw materials. They can establish long-term agreements with suppliers and collaborate on product development and innovation (Saringat and Mohd, 2019). In order to reduce their dependence on a single supplier or type of raw material, Bumiputera entrepreneurs can diversify their supplier base. They can source raw materials from multiple suppliers or countries to minimize the risk of supply disruptions (Osman et al. 2020). For strategic sourcing, Bumiputera entrepreneurs can adopt a strategic sourcing approach to optimize their supply chain and reduce costs. They can identify the most cost-effective sources of raw materials and negotiate better deals with suppliers (Bakar et al. 2019).

2.2.4 Technology Application

Technology application has become an increasingly important consideration for entrepreneurs in all industries, and the aluminium industry is no exception. One key variable of technology application that can help enhance Bumiputera entrepreneurs' success in the aluminium industry is Industry 4.0. Industry 4.0 technologies, including automation, artificial intelligence, and IoT, can enable Bumiputera entrepreneurs to streamline their operations, increase efficiency, and reduce costs (Abdul Hamid et al. 2020). This can be particularly relevant for small and medium-sized Bumiputera enterprises that may lack the resources to invest in expensive machinery and equipment. The adoption of Industry 4.0 technologies can help small and medium-sized enterprises overcome challenges such as high labor costs, low productivity, and inconsistent product quality, leading to greater competitiveness in the market (Musa and Ibrahim, 2020). Another technology application variable to consider is digital marketing. In today's digitally connected world, having a strong online presence and digital marketing strategy is essential to reaching new markets and driving sales. Bumiputera entrepreneurs can

take advantage of a range of tools and channels, including social media platforms, search engine optimization, webinars, and online marketplaces such as Alibaba or Amazon (Al-Qasyi et al. 2019). The adoption of e-commerce platforms in the Malaysian aluminium industry can result in increased sales, better customer engagement, and more efficient procurement processes (Abu Bakar, 2020). Cloud-based financial management and accounting software is another important variable for Bumiputera entrepreneurs in the aluminium industry. Accurate financial management is often critical to the success of small businesses, and technology can enable easier tracking and analysis of financial data. Finally, supply chain management systems can also be a valuable variable in technology application for Bumiputera entrepreneurs in the aluminium industry. By using technology to monitor supplier performance, reduce lead times and costs, and improve inventory management, Bumiputera entrepreneurs can enhance their competitiveness and efficiency. Supply chain challenges were a significant barrier to success for Bumiputera SMEs in the Malaysian aluminium industry, highlighting the importance of addressing this variable through technology application (Omar et al. 2020).

2.2.5 Economic Development

By providing access to training, technical assistance, capital, and other resources, and promoting market linkages and networking opportunities, economic development can improve the capabilities and competitiveness of Bumiputera-owned businesses. One key variable of economic development that can enhance technology application for Bumiputera entrepreneurs in the aluminium industry is training and technical assistance (Yunus and Ismail, 2019). Through targeted training programs, entrepreneurs can acquire the skills and knowledge needed to effectively adopt and utilize new technologies. According to a recent report by the Bumiputera Agenda Steering Unit (2021), training and capacity building programs can help to address challenges such as the lack of technical expertise and knowledge gaps in manufacturing processes, leading to more effective adoption of technology. Economic development can help to address this challenge by providing access to alternative sources of capital, such as crowdfunding, venture capital, and microfinance. Access to capital is a critical factor in the success of more than 70% of SMEs in the Pakistani aluminium industry (Ikram et al. 2021). Market linkages and networking opportunities are another variable that can be promoted through economic development initiatives (Nkemdirim and Maduka, 2020). By facilitating connections between Bumiputera entrepreneurs and potential partners, suppliers, and customers, these initiatives can help to expand market reach and create new business opportunities. Creating effective market linkages is a key challenge for Bumiputera SMEs in

the Malaysian aluminium industry, highlighting the importance of programs that can strengthen these connections (Omar et al. 2020). Finally, digital infrastructure can also be an important element of economic development for technology application among Bumiputera entrepreneurs. Access to high-speed internet, digital platforms, and e-commerce tools can help to reduce barriers to market entry, increase efficiency in procurement and supply chain management, and enhance customer engagement (Munir et al. 2019). It found that adopting e-commerce platforms among SMEs in the Malaysian aluminium industry can enable greater access to global markets, leading to increased sales and business opportunities (Abu Bakar et al. 2021).

2.3 Literature Gaps

Studies on the market, financial and supplier resources had been conducted in Malaysia. This could include studying government funding programs, private investment options, and crowdfunding platforms (Ghazali et al. 2019). Studies also conducted on the limited market knowledge. It is due to the cases of Bumiputera entrepreneurs in the aluminium industry may lack knowledge of the global market and its trends (Norazila et al. 2020). More research is needed to identify how Bumiputera entrepreneurs can access market knowledge and compete in international markets (Razak et al. 2020). There is also the research on technology challenges. The aluminium industry is rapidly evolving, with new technologies emerging all the time. Bumiputera entrepreneurs may not be able to keep up with these changes due to lack of knowledge or resources (Sharif et al. 2019). Further research could focus on identifying technological challenges faced by Bumiputera entrepreneurs in the aluminium industry, and initiatives to address these challenges. According to the other literature review, environmental sustainability while the aluminium industry is often associated with environmental issues such as energy consumption and greenhouse gas emissions (Akintoye and Seriki, 2018). Bumiputera entrepreneurs may face additional challenges related to environmental sustainability (Nasharuddin et al. 2020). Research is needed to identify the specific environmental sustainability challenges faced by Bumiputera entrepreneurs in the aluminium industry, and initiatives to promote sustainable practices (Hojat et al. 2021). Therefore, there is need to the research on the moderating effect of technology application in enhancing the weakness of market, finance and supplier resources throughout Bumiputera entrepreneur's aluminium success.

2.4 Underpinning Theories

2.4.1 Market Theory

Market theory describes the interaction between buyers and sellers, and the factors that influence the prices and quantity of goods and services exchanged in a market (Philip and Gary, 2021). For Bumiputera entrepreneurs in the aluminium industry, understanding market theory can help them to make strategic decisions about pricing, production levels, and marketing (Richard and Christopher, 2020). One important concept in market theory is supply and demand. The price of aluminium products will vary depending on how much is available for sale (supply) and how much buyers are willing to pay for it (demand). Bumiputera entrepreneurs should carefully monitor market conditions and adjust their production and pricing strategies accordingly (Kevin and Philip, 2021). Another important concept in market theory is competition. In the aluminium industry, Bumiputera entrepreneurs may face competition from both domestic and foreign companies. To remain competitive, they may need to innovate and offer unique products or services that distinguish them from their rivals (Roberts and Daniel, 2017). Finally, market theory emphasizes the importance of customer satisfaction. Bumiputera entrepreneurs should strive to meet the needs and expectations of their customers by offering high-quality products, excellent customer service, and competitive prices. Overall, understanding market theory is essential for Bumiputera entrepreneurs in the aluminium industry to succeed in a competitive market.

2.4.2 Market Access Theory

Market Access Theory is a concept that suggests that access to markets is a critical factor in the success of businesses (Mohammed et al. 2019). This theory may be applied to Bumiputera entrepreneurs in the aluminium industry in Malaysia since their success may depend on access to domestic and international markets. Bumiputera entrepreneurs in the aluminium industry in Malaysia may face challenges in accessing markets due to various reasons like language barriers, lack of understanding about export-import procedures, and limited access to financial resources (Rahman et al. 2016). To overcome these challenges and improve their market access, Bumiputera entrepreneurs in the aluminium industry in Malaysia may need to develop effective marketing strategies, expand their network, and seek out government support (Ismail and Abdullah, 2019). For instance, they may develop a marketing strategy to promote their products in international markets, thereby increasing the demand for their products. They may collaborate with other firms or associations to access larger networks and market opportunities.

Moreover, they can seek government support to finance their marketing efforts, increase their competitiveness and connect with potential buyers (Ashar and Nabiha, 2016). Research into the experiences of Bumiputera entrepreneurs in Malaysia suggests that market access can be a significant challenge, particularly for those who are operating SMEs (Ismail and Abdullah, 2019). Thus, understanding the dynamics of market access and developing successful strategies to address these challenges may improve their ability to compete and succeed in the aluminium industry in Malaysia.

2.4.3 Resource-based View (RBV) Theory

The Resource-based View (RBV) is a theory that suggests that a firm's resources and capabilities are the key determinants of its competitive advantage and long-term success (Yusoff et al. 2015). This theory has been applied in various industries, including the aluminium industry in Malaysia, where Bumiputera entrepreneurs play a significant role. Bumiputera entrepreneurs are Malaysian business owners who are categorized as ethnic Malays, Borneans, or indigenous peoples of Malaysia (Ramli and Abidin, 2016). The RBV theory suggests that these entrepreneurs can gain a competitive advantage in the aluminium industry in Malaysia by developing and utilizing unique resources and capabilities (Aziz et al. 2018). Some of the resources and capabilities that may contribute to the competitive advantage of Bumiputera entrepreneurs in the aluminium industry in Malaysia include access to government contracts, local knowledge and networks, strong financial backing, and innovation in the use of aluminium materials (Alias and Ahmad, 2014). Research has suggested that factors such as strategic resources, business strategies, and firm performance are important for understanding the competitive advantage of Bumiputera SMEs in the industry (Aziz et al. 2018). The development and utilization of strategic resources and capabilities can lead to a sustainable competitive advantage for these entrepreneurs in the aluminium industry in Malaysia.

2.4.4 Resource Dependency Theory

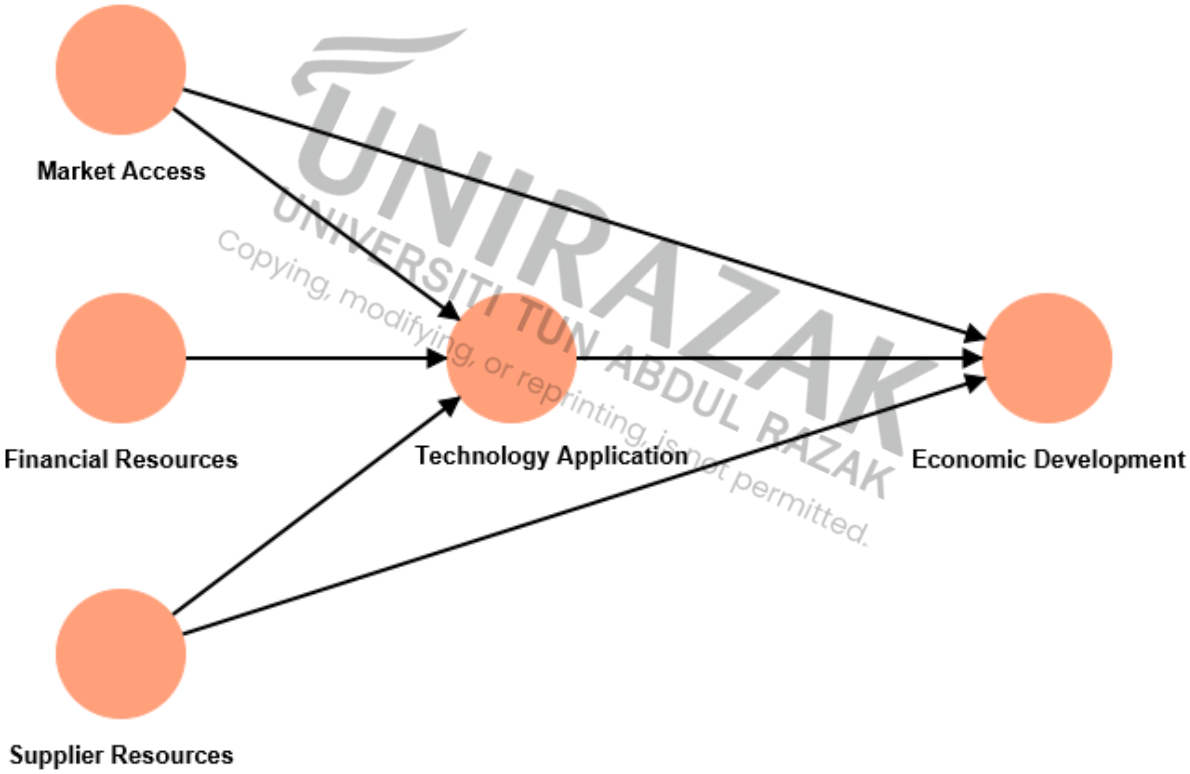
Resource Dependency Theory (RDT) is a concept that suggests that organizations depend on external resources to function, survive and grow (Zachariades and Nurdin, 2019). This theory may be applied in the context of Bumiputera entrepreneurs in the aluminium industry in Malaysia, as they may depend on external resources to maintain and grow their businesses. In the aluminium industry, Bumiputera entrepreneurs may rely on external resources such as aluminum suppliers, government contracts, and employees with technical expertise (Rajahram

and Velu, 2019). According to RDT, these external resources can have a direct impact on the performance and survival of the business (Rajahram and Velu, 2019). For example, if the aluminum supplier increases their prices or reduces their availability of the aluminum material, the entrepreneurs' ability to produce their products may be impacted. Research has suggested that Bumiputera entrepreneurs in Malaysia may face challenges in access to external resources (Hassan et al. 2018). This may include limited access to funding, limited government support, and difficulty in accessing international markets. RDT suggests that this may put these entrepreneurs at a disadvantage in the industry since they depend on external resources for their business operations. To mitigate these challenges, Bumiputera entrepreneurs in the aluminium industry in Malaysia may need to develop strong relationships with their suppliers, seek out alternative external resources, and collaborate with other firms in the industry (Tehseen and Mushtaq, 2019). This may help them to reduce their dependence on any single external resource and increase their chances of survival and success in the industry.

2.5 Conceptual framework

The conceptual framework in Figure 1 for the study of the mediating effect of technology application in enhancing the weakness of market, finance and supplier resources throughout Bumiputera entrepreneur's aluminium success can be supported by Bumiputera success theory. The conceptual framework provided an overview on the significant relationship between market, financial and supplier resources. This study will involve three independent variables which are market access, financial resources and supplier resources. While mediating variable is technology application and dependent variable is economic development.

Figure 1: The Mediating Effect of Technology Application in Enhancing the Weakness of Market, Finance and Supplier Resources throughout Bumiputera Entrepreneurs Aluminium Success



2.6 Research Hypotheses Development

The research hypotheses over the moderating effect of technology application in enhancing the weakness of market, finance and supplier resources throughout Bumiputera entrepreneur's aluminium success are as follows:

H1: There is positive relationship between market access and economic development.

The increasing of market access for Bumiputera entrepreneurs in the aluminium industry will lead to economic development benefits for both the entrepreneurs and the country, with higher levels of investment, technological advancement, and job creation. it was found that market access is positively related to the economic growth of small and medium-sized enterprises (SMEs) in the manufacturing industry in Malaysia. The study also found that market access significantly influenced the export performance of SMEs, which can promote economic development (Norashidah Mohamed et al.2021). A study by Mohd Faizal Mohd Isa et al. (2018) found that access to markets has positive and significant effects on the performance of Bumiputera SMEs in the service industry in Malaysia. The study found that market access has a positive impact on revenue growth, business expansion, and employment opportunities for Bumiputera SMEs, which can translate into economic development.

H2: There is positive relationship between financial resource and economic development.

Financial resources play a critical role in the performance and economic development of Bumiputera entrepreneurs in various industries, including the aluminium industry. In a study by Sallahuddin Hassan et al. (2019), it was found that financial resources, particularly access to loans, positively affect the job-creating potential of Bumiputera SMEs in the services sector in Malaysia. The study revealed that more access to loans leads to more job creation, which contributes to economic development. Another study by Maimunah Aladzemi et al. (2015) investigated the influence of the government financial assistance on the performance of Bumiputera SMEs in Malaysia. The study found a positive relationship between government financial assistance and the performance of SMEs, which also contributes to overall economic development in the country (Maimunah Aladzemi, 2015).

H3: There is positive relationship between supplier resources and economic development.

The benefits of having reliable and efficient suppliers include better product quality, have cost saving, efficient production processes, and overall streamlined operations, which can contribute to overall economic development. A study by Marko Hazlina Abdul Halim et al.

(2017) investigated the critical factors influencing supplier selection in Malaysian SMEs. The study revealed that the availability of reliable suppliers and sourcing new raw materials play a key role in business success. Another study by Mohd Nor Hakimin Yusoff et al. (2021) found that supplier selection and management are essential for the success of SMEs in the manufacturing industry in Malaysia. The study highlighted that managing supplier relationships effectively can lead to cost savings, better quality products, and reduced production time (Mohd Nor Hakimin Yusoff et al. 2021).

H4: There is positive relationship between market access and technology application.

By expanding their customer base, Bumiputera entrepreneurs can increase revenues, which can provide them with the necessary financial resources to invest in advanced technology tools, streamline their processes, reduce costs, and improve product quality. Hence, contributing to the overall success of Bumiputera entrepreneurs in the aluminium industry. A study by Reza Sanaye et al. (2020) investigated the impact of market access on high-tech firms' innovation performance in the Iranian context. The study found that market access positively affects technological innovation, which can contribute to the success of high-tech firms (Reza Sanaya et al. 2020). Next research by Sunhee Han et al. (2020) investigated the relationship between market access and technology innovation in the Korean biotechnology sector. The study found that market access significantly affects technology innovation, which can lead to competitive success (Sunhee Han et al. 2020).

H5: There is positive relationship between financial resources and technology application.

The availability of financial resources can help Bumiputera entrepreneurs adopt advanced technology tools and techniques, which can ultimately lead to enhanced efficiency, productivity, cost savings, and improved product quality. A study by Nor Afifah Basri et al. (2020) investigated the influence of financial resources on technological innovation and firm performance of SMEs in the manufacturing sector in Malaysia. The study found a significant positive relationship between financial resources and both technological innovation and firm performance (Nor Afifah Basri et al. 2020). In a study conducted by Abdul Muhaimin Sahat and Siswa Siska Sari (2020), it was found that access to financial resources positively affects the technological innovation performance of SMEs in Indonesia's manufacturing sector. The study concluded that by having access to financial resources, SMEs in the manufacturing sector could increase their investment in advanced technology and product innovation (Abdul Muhaimin Sahat and Siswa Siska Sari, 2020).

H6: There is positive relationship between supplier resources and technology application.

The availability of reliable and competent suppliers can positively impact the application of technology for Bumiputera entrepreneurs in various industries, including the aluminium industry. By working with reliable and advanced suppliers, Bumiputera entrepreneurs can benefit from their technical insights, improve their understanding of advanced technological applications, and ultimately promote their overall efficiency, cost savings and product quality. A study by Ananda Jayawardane et al. (2020) investigated the influence of supplier relationship management (SRM) on technology transfer in the Sri Lankan food and beverage sector. The study found that SRM positively affects the technology transfer, which can lead to improved product innovation, cost reduction, and productivity enhancement (Ananda Jayawardane et al. 2020). A study by Ananda Jayawardane et al. (2020) investigated the influence of supplier relationship management (SRM) on technology transfer in the Sri Lanka food and beverage sector and there was found that SRM positively affects the technology transfer, which can lead to improved product innovation, cost reduction, and productivity enhancement.

H7: There is positive relationship between technology application and economic development.

Technology can serve as a catalyst for economic development and success for Bumiputera entrepreneurs in the aluminium industry. By embracing innovation and using technology to their advantage, entrepreneurs can achieve better business outcomes, and contribute to the growth and development of their community and industry. (Abdul Majeed and Fadhil, 2019). The use of technology can lead to increased productivity, efficiency, and competitiveness, which can in turn, result in stronger economic growth and development for Bumiputera entrepreneurs in the aluminium industry (Khan, 2018).

H8: Technology application mediates the relationship between market access and economic development.

It refers to the idea that the use of advanced technology can play a significant role in enhancing the link between market access and economic development for Bumiputera-owned aluminium businesses (Hassan et al. 2019). In this scenario, market access refers to the ability of Bumiputera entrepreneurs to enter into new markets and connect with diverse customer segments. Economic development, on the other hand, refers to the overall growth and profitability of the Bumiputera-owned aluminium industry (Ebrahim et al. 2018). According to this hypothesis, advanced technology can help Bumiputera entrepreneurs improve their products and services, develop new markets, and create efficient supply chains (Idris et al.

2020). By adopting modern technologies such as robotics, automation, and digital marketing tools, Bumiputera entrepreneurs can enhance their competitiveness and profitability. Moreover, technology can help Bumiputera-owned aluminium businesses to overcome the barriers to entry in the industry by improving their production efficiency, reducing costs, improving quality control, and enhancing their ability to respond to market demand (Nasruin et al. 2017).

H9: Technology application mediates the relationship between financial resources and economic development.

In this scenario, financial resources denote the financial capital or funding available to Bumiputera entrepreneurs to invest in their business activities, including expanding their operations, acquiring new technologies, hiring skilled employees, and marketing their products to new markets (Ahmad et al. 2020). Economic development, on the other hand, refers to the improvement in the profitability, productivity, and growth of the Bumiputera-owned aluminum industry over time (Che Rose et al. 2017). According to this hypothesis, the application of advanced technologies by Bumiputera entrepreneurs can help them to overcome the challenges posed by limited financial resources. By adopting innovative technologies, such as automation, artificial intelligence, and smart manufacturing, Bumiputera entrepreneurs can improve their manufacturing processes, reduce operational costs, and enhance the quality and competitiveness of their products (Suryana and Samantho, 2019). Moreover, technology adoption can help Bumiputera entrepreneurs to tap into new markets, expand their customer base, and increase their sales revenues. By using digital marketing tools, social media, and online platforms, Bumiputera businesses can engage with potential customers and maintain strong relationships with existing ones (Rajadurai and Chia, 2020). In summary, technology adoption can act as a moderator and improve the relationship between financial resources and economic development for Bumiputera-owned aluminum businesses by enabling them to overcome financial constraints and improve their overall business performance (Che Rose et al. 2017).

H10: Technology application mediates the relationship between supplier resources and economic development.

In this context, supplier resources refer to the inputs and resources that Bumiputera entrepreneurs obtain from their suppliers to produce their products, including raw materials, technology, and expertise (Yusof et al. 2019). Economic development refers to the overall

growth and profitability of the Bumiputera-owned aluminium industry (Yusof at al. 2019). According to this hypothesis, the adoption of advanced technology can help Bumiputera entrepreneurs to optimize their supplier resources, thus improving their ability to compete in the market (Ibrahim and Sumardi, 2017). For example, advanced technologies such as automation, material handling systems, and digital communication systems can enable Bumiputera entrepreneurs to improve their supply chain management, reduce production costs, enhance efficiency and productivity, and improve the quality of their products. Moreover, technology can enable Bumiputera entrepreneurs to engage more effectively with their suppliers, build stronger relationships, and negotiate more favorable terms, such as lower prices, longer payment periods, and access to more advanced technology and resources (Che Rose and Mohd Suki, 2020). In summary, technology adoption can act as a moderator and improve the relationship between supplier resources and economic development for Bumiputera-owned aluminium businesses by helping them to improve the efficiency and effectiveness of their supply chain and supplier management (Yusof at al. 2019).

2.7 Chapter Summary

This research will facilitate the effect of technology application in enhancing the weakness of market access, financial resources and supplier resources throughout bumiputera aluminium entrepreneur's success. The Bumiputera aluminium entrepreneurs in Malaysia have been facing significant challenges in enhancing their market position, financial stability, and supplier resources. In recent years, there has been a growing interest in the use of technology application to address these issues and help these entrepreneurs achieve success in their businesses. Technology application provides significant opportunities for Bumiputera aluminium entrepreneurs to overcome their weaknesses in market, financial, and supplier resources and achieve success in their businesses. However, meaningful progress will depend on the ability of entrepreneurs themselves, as well as government and industry stakeholders, to embrace digital transformation and build supportive ecosystems for technology adoption and innovation.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This approach involves quantitative research method. Quantitative methods can be used to collect data on factors such as market access, financial resources, supplier resources, technology application and economic development. This data can then be analysed using statistical techniques to identify any relationships and trends. The use of this method most likely involves visiting Bumiputera entrepreneurs in the aluminium industry to obtain a deeper understanding of the effects of technology application as a moderating factor on their success. This study aims to identify the key technologies and strategies that can help these entrepreneurs build thriving businesses, and to offer recommendations for policymakers, business leaders, and entrepreneurs who want to support and promote success among this important group of entrepreneurs. One observation method for collecting data in questionnaires related to the mediating effect of technology application in enhancing the weakness of market access, financial resources, and supplier resources for bumiputera entrepreneur's aluminium success is to use self-administered questionnaires. Self-administered questionnaires are a type of observation method that involves asking respondents to complete a written questionnaire on their own without the researcher being present. This method is particularly useful when the sample size is large, the study is geographically dispersed, and/or the respondents are hard to reach. Overall, the quantitative research approaches and methods can help provide a comprehensive understanding of the mediating effect of technology in enhancing market, finance and supplier resources weaknesses for the success of Bumiputera entrepreneurs in the aluminium industry.

3.2 Research Design

The study on the mediating effect of technology application in enhancing the weakness of market access, financial resources and supplier resources throughout bumiputera entrepreneurs aluminium success will make use of the quantitative research design. To be more specific in the research design, the explanatory research design will be applied to the mediating effect of technology application in aluminium industry on the dimensions of the weaknesses that become obstacles and economic development within the Malaysian bumiputera entreprenuers (Razak et al. 2021). To meet the research objectives, a proper and systematic of study design should be included (Thornhill et. al 2019). The aim of the study is to explain the mediating effect of technology application in strengthen the weakness of market access, financial

resources, supplier resources and economic development in Malaysian bumiputera entrepreneurs aluminium. An explanatory research design is a type of research design which focuses on the variables that determine the mediating effect of the relationships and explains the causes and effects of the variables defining the phenomenon to be studied (Creswell and Plano Clark, 2018). In order to identify and explain the effect of technology application in a given context, it has been chosen that type of investigation will be conducted as part of an inductive study or quantitatively based relationship with surveys strategy. Quantitative research is used in research to illustrate, forecast, form, and test theories by using quantitative data as supporting evidence (Thornhill et. al 2019). The ungenuous study environment is intended to gather the responses of respondents via an online questionnaire at work (Razak et al. 2021). Thornhill et. al (2019) further argued that if a relationship between variables could be established, the most appropriate way to do this would be by conducting cause and effect studies. The findings of the study will serve to help Malaysia's bumiputera entrepreneurs learn more about how technology application influences the weakness of the obstacles and economic development. The results of the survey have generated a number of numerical data to be analysed, which will serve as an enabling principle in deductive reasoning for definition, explanation and prediction of observed phenomena.

3.3 Unit of Analysis & Time Horizon

The unit of analysis for this research study will be Bumiputera entrepreneurs in the aluminium industry. This group of entrepreneurs is particularly suitable for the study since they are known to face challenges in enhancing their market, finance and supplier resources. The use of technology can help moderate these challenges, and this study aims to investigate how technology can impact Bumiputera entrepreneurs' success in the industry. The study focuses particularly on entrepreneurs, as opposed to firms or other units of analysis, to gain better insights into how technology is applied in the aluminium industry. The unit of analysis refers to what is being studied, and it is critical to consider when designing a research study (Yin, 2017). The use of entrepreneurs as the unit of analysis provides a more in-depth understanding of how they leverage technology to overcome market, finance, and supplier resources.

As time horizon for this research is cross-sectional. Cross-sectional time studies are a type of study where data is collected at one point in time from different respondents to study and compare variables. They focus on comparing the characteristics of groups of individuals, rather than individual changes over time. This approach enables the researcher to capture data from a wide range of respondents. Cross-sectional time studies are generally less time-consuming and

more cost-effective than longitudinal studies since they require fewer resources and less time. Cross-sectional time studies provide an opportunity to collect relevant data and analyze the effect of technology use on the success of Bumiputera entrepreneurs in the aluminium industry (Bryman and Bell, 2019). Technology adoption can enhance access to financial resources, supplier availability, and market access, thereby improving performance in the Bumiputera aluminium industry. Therefore, future research studies should consider using cross-sectional time studies to capture the effects of technology adoption on Bumiputera aluminium industry success effectively.

3.4 Sampling Design

There are five steps to sampling design. The first step is clearly defined the target population. The second step is select sampling frame and choose sampling technique as third step. The fourth step is to determine the sample size. The final step is to collect data as well as asses the response rate. The target group as mentioned in the above of section is bumiputera entrepreneurs especially who had related to the business in aluminium industry. There are around 100 entrepreneurs of bumiputera in Malaysia. The sampling process refers to the process of selecting a subset of individuals or items from a larger population to represent that population (Cui et al. 2021). The selection of the sample is important to ensure that the sample accurately represents the population being studied and prevents bias that can affect the validity and reliability of the research results (Tao et al. 2021).

In Partial Least Squares Structural Equation Modeling (PLS SEM), statistical power is a crucial factor that determines the reliability and validity of the results. The statistical power of a study is defined as the probability of detecting a significant effect or relationship if it exists in the population. In PLS SEM, the statistical power can be influenced by many factors, including the sample size, the number of variables, and the effect size. According to a study by Hair et al. (2019), the ideal sample size for PLS-SEM models with more than three constructs should have a minimum of 10 times as many observations as the number of indicators in the model. A common rule of thumb in statistical analysis is that a statistical power of at least 80% is required to ensure a study's reliability (Hair et al. 2019). This means that there is an 80% chance of detecting a significant effect or relationship if it exists in the population.

According to a study by Hair et al. (2019), the ideal sample size for PLS-SEM models with more than three constructs should have at least ten times more observations than the number of indicators in the model. This is because the minimum R is primarily used in the model to

estimate the minimum sample size. This method, based on Cohen's (1988; 1992) power tables for least squares regression, relies on a table listing the minimum required sample sizes based on three items. The first element of the least R-square method is the maximum number of arrows pointing to a latent variable in a model. The second is the level of significance used. The third is the minimum *R* in the model is a reduced version of the table by Hair et al. (2014, p. 21). This reduced version focuses on the 0.05 significance level, which is commonly used significance level in IS and assumes that power is established.

Therefore, the minimum sample size required to achieve a statistical power of 80% in a PLS SEM model with four variables will depend on the number of indicators per construct, the expected effect size, and the desired level of significance. Typically, a PLS SEM model with four variables will require a sample size of at least 100 to achieve a statistical power of 80%. This assumes an alpha level of 0.05, a mediate effect size, and at least three indicators per construct. It is important to note that increasing the number of indicators per construct or the effect size will require a larger sample size to achieve the desired statistical power. Table 3.1 shows the sample size recommendation in PLS SEM with a statistical power of 80%.

Table 1: Minimum Sample Size in PLS SEM with Statistical Power of 80%

Maximum number of arrows pointing at a construct	Significance level							
	0.01				0.05			
	Minimum R-square				Minimum R-square			
2	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
3	158	75	47	38	110	52	33	26
4	176	84	53	42	124	59	38	30
5	191	91	58	46	137	65	42	33
6	205	98	62	50	147	70	45	36
7	217	103	66	53	157	75	48	39

(Source: Kock and Hadaya, 2018)

3.4.1 Sampling Plan

A non-probabilistic sampling plan is a sampling method that does not rely on random selection (Nor et al. 2018). This plan allows to select specific participants based on predetermined criteria, such as their expertise or knowledge on the research topic (Nor et al. 2018). The following non-probability sampling plan will be used to investigate the mediating effect of technology application in enhancing the weakness of market access, financial resources, and

supplier resources throughout Bumiputera entrepreneurs' aluminium success. The target population will be Bumiputera entrepreneurs in the aluminium industry who have successfully applied technology to mediate the effects of market access, financial resources, and supplier resources. The sampling frame will comprise individuals who have been identified through extensive research as having the knowledge and expertise required to provide valid and reliable responses to the research questions. This research approach will provide detailed insights into the experiences of successful Bumiputera entrepreneurs in the aluminium industry who have effectively used technology to overcome the obstacles they face.

3.4.2 Sample Size

In this research, the maximum number of arrows pointing at a construct is six which are included of independent and mediating variables. Therefore, the minimum of sample size to achieve a statistical power of 80% is 75 with 0.25 of R-square value and the probability of error is 5%. As minimal for 75 of sample size, a total of 80 questionnaires will be distributed to bumiputera respondents who had been working in Malaysian aluminium industry. As response, 93.75% rate was achieved which took one week period in May 2023.

3.5 Data Collection Method

The data collection method for investigating the mediating effect of technology application in enhancing the weakness of market access, financial resources, and supplier resources throughout Bumiputera entrepreneurs' aluminium success should be appropriate to capture the necessary information required to address the research objectives. Depending on the research design, various methods of data collection may be used. Several data collection methods can be used, including surveys, interviews, focus groups, and observation. However, the most appropriate method of data collection for this research is the survey method. The survey method involves collecting data from participants using structured questionnaires. This method is appropriate for investigating the mediating effect of technology application as it allows for the collection of quantitative data, which can be analysed using statistical methods. As cited in a study by Majid et al. (2019), which investigated the factors influencing technology adoption among SMEs in Malaysia, the survey method was used to collect data from the participants. The study involved developing a structured questionnaire that was distributed to the participants. The collected data was then analysed using descriptive and inferential statistic.

3.6 Questionnaire Design

The questionnaire design process helps respondents to provide the most accurate answers possible when answering the questions (Bougie and Sekaran, 2019). The most practical and cost-effective method of data collection is surveys in the form of questionnaires that can be completed anywhere, anytime, regardless of time and place. The questionnaire consists of standardized queries or assertions with available results as well as in using a point scale (Hair et al. 2018).

Self-administered internet questionnaires are a prevalent method of data collection in today's digital era. Internet questionnaires offer many benefits, such as cost-effectiveness, flexibility, and ease of administration. A self-administered internet questionnaire is completed by the participants in the comfort of their homes or offices, at their convenience, making it a popular data collection method among researchers. The online survey hosted by Google Forms to the participants by services application of WhatsApp and Telegram.

There are five sections through this questionnaire which are following by:

Section A: Demographic Information

This section will collect information about the participants, including age, gender, level of education, years of experience in the aluminium industry, and the size of their businesses.

Section B: Technology Application and Business Success

This section will focus on collecting information about the participants' current level of technology application. The questions in this section should be designed to capture the type of technology used by the participants, the level of investment in technology, and how technology has impacted their businesses.

Section C: Market Access

This section will collect information on the challenges faced by the participants in accessing the market. The questions should be designed to capture the level of competition in the market, the availability of marketing channels, and how technology has impacted their market access.

Section D: Financial Resources

This section will collect information on the challenges faced by the participants in acquiring financial resources. The questions should be designed to capture the availability of funding

sources, the level of interest rates, and how technology has impacted their access to financial resources.

Section E: Supplier Resources

This section will collect information on the challenges faced by the participants in finding reliable suppliers. The questions should be designed to capture the availability of suppliers, the quality of the supplied goods and services, and how technology has impacted their supplier resources.

Section F: Economic Development

This section should collect data on how technology application has mediated the effects of market access, financial resources, and supplier resources on Bumiputera entrepreneurs' aluminum success.

In conclusion, the questionnaire design for investigating the mediating effect of technology application in enhancing the weakness of market access, financial resources, and supplier resources throughout Bumiputera entrepreneurs' aluminum success should be appropriate to capture the necessary information required to address the research objectives. Sections A, B, C, D, E and F are essential for obtaining valid and reliable data from the participants. The questionnaire should be designed to ensure that the questions are unbiased, easy to understand, and relevant to the research objectives. Table 3.2 shows the summary of the questionnaire design.

Table 2: Summary of the questionnaire design

Section	Variable	Source	Items	Adoption/Adaptation
A	Demographic factors	Saunders et al. 2019	6	-
B	Technology application	Ab Rahman et al. (2021)	6	Adaptation
C	Market Access	Monfaredzadeh and Rezaei, (2020)	6	Adaptation
D	Financial Resources	Abdul Rahman and Mohd Nor (2019)	6	Adaptation
E	Supplier Resources	Rahman et al. (2021)	6	Adaptation
F	Economic Development	Uddin et al. (2021)	6	Adaptation

3.7 Pilot Study

A pilot test is an essential step in ensuring the validity and reliability of a study. It involves conducting a small-scale test of the research methodology to identify potential issues and gather data to refine the study design. To accept the validity and reliability of pilot test provided valuable insights into potential issues, which were addressed before implementing the full study. Additionally, the data collected from the pilot test was analyzed for its reliability, and the results indicated a high level of consistency. Therefore, it can be confidently state that the pilot test confirmed the validity and reliability of our study design. Cronbach's alpha is a measure of reliability or internal consistency of a psychological test or scale. It indicates to what extent the items in the scale measure the same construct or concept and whether they are consistently measuring the construct. Cronbach's alpha ranges from 0 to 1, with higher values indicating better internal consistency and reliability. Generally, a Cronbach's alpha of at least 0.7 is considered acceptable, while values above 0.8 are deemed good to excellent. However, the acceptable range depends on the context and purpose of the test. Table 3.3 shows the reflective measurement model result.

Table 3: Reflective Measurement Model Result Pilot Test

Construct	Measurement item	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ED	ED1	0.941	0.958	0.959	0.966	0.827
	ED2	0.905				
	ED3	0.905				
	ED4	0.949				
	ED5	0.886				
	ED6	0.87				
FR	FR1	0.568	0.892	0.913	0.919	0.659
	FR2	0.78				
	FR3	0.873				
	FR4	0.872				
	FR5	0.863				
	FR6	0.868				
MA	MA1	0.532	0.786	0.816	0.847	0.488
	MA2	0.773				
	MA3	0.759				
	MA4	0.777				
	MA5	0.523				
	MA6	0.768				
SR	SR1	0.790	0.876	0.903	0.908	0.627
	SR2	0.505				
	SR3	0.875				
	SR4	0.849				
	SR5	0.785				
	SR6	0.884				
TA	TA1	0.724	0.857	0.857	0.894	0.586
	TA2	0.82				
	TA3	0.752				
	TA4	0.802				
	TA5	0.817				
	TA6	0.664				

3.8 Research Instrument

Smart PLS, also known as Partial Least Squares Structural Equation Modeling, is a widely used research instrument that is designed to test complex models with both latent and manifest variables. The tool is particularly well-suited for exploring the mediating effects of multiple variables, such as the application of technology in addressing the weakness of various factors in business management. The research instrument chosen for the study is Smart PLS because it is ideal for analyzing complex models that have multiple latent and manifest variables. The study participants will consist of Bumiputera Aluminium employees, customers, and suppliers, who will be asked to respond to structured questionnaires. The questionnaires will be designed to measure the level of application of technology and the perceived impact of technology on market access, financial resources, and supplier resources. The data collected from the questionnaires will be analyzed using Smart PLS, which will identify the mediating effect of technology on these variables. In this questionnaire will be measured by likert scale which are

a. (1) Strongly disagree
b. (2) Disagree
c. (3) Neutral
d. (4) Agree
e. (5) Strongly agree

3.9 Measurement Item

Table 4: Measurement Item of Variables

Section	Variables	Items	Source	Likert Scale
A	Market Access (Independent Variable)	1. Geographic limitations are a major barrier to accessing new or existing markets. 2. Digital marketing channels have the potential for Bumiputera entrepreneurs to overcome geographic limitations and expand their reach to new markets. 3. The use of social media platforms to promote products or services can be effective in reaching new customers in different geographic locations. 4. Government-backed initiatives aimed at promoting Bumiputera businesses can be helpful in expanding market reach. 5. Accessing international markets brings additional challenges such as regulatory barriers and cultural differences. 6. Expanding market reach through international trade can bring significant benefits to Bumiputera entrepreneurs such as increased revenue and exposure to new ideas and technological advances.	Ab Rahman et al. (2021)	5

B	Financial Resources	1. Access to alternative sources of funding, such as crowdfunding or angel investors, is important for Bumiputera entrepreneurs to achieve financial stability. 2. The introduction of government-backed financial support schemes, such as grants, financial aid, or other facilities, can improve the financial status of Bumiputera entrepreneurs in the aluminium industry. 3. Access to financial support and investment can enable Bumiputera entrepreneurs in the aluminium industry to increase production, product quality, and expand market reach. 4. Financial literacy and management training programs can enable Bumiputera entrepreneurs in the aluminium industry to develop better financial acumen and improve their financial status. 5. Bumiputera entrepreneurs in the aluminium industry would benefit from the availability of networking and mentorship opportunities to receive	Monfaredzadeh and Rezaei, (2020)	5

		guidance on accessing financial resources. 6. Government initiatives that promote and support financial inclusion can enable Bumiputera entrepreneurs in the aluminium industry to overcome challenges related to access to funding or capital.		
C	Supplier Resources	1. Technology helped Bumiputera entrepreneurs in the aluminium industry improve their supplier resource management. 2. The availability and diversity of supplier options is a significant barrier for success in the aluminium industry for Bumiputera entrepreneurs. 3. Technology is an effectively been in streamlining supplier communication and coordination within the aluminium industry. 4. Technology enabled access to wider supplier networks and increased supplier diversity for the aluminium industry. 5. Technology help in identifying and addressing supplier risks and potential disruptions within the aluminium industry. 6. Further integration of technology assist Bumiputera	Abdul Rahman and Mohd Nor (2019)	5

		entrepreneurs in the aluminium industry in their supplier resource management.		
D	Technology Applications (Mediating Variable)	1. Technology plays an important role in improving the efficiency of business operations. 2. Using technology in business operations is necessary to stay competitive in the market. 3. Technology application helps to overcome the weakness of market access in the aluminium industry. 4. Technology application helps to enhance your financial resources in the aluminium industry. 5. Technology application helps to improve supplier resources in the aluminium industry. 6. Government-supported initiatives are helpful in facilitating technology adoption in aluminium business.	Rahman et al. (2021)	5
E	Economic Development	1. Technology has positively impacted the economic development of the aluminium industry. 2. Technology has contributed to the growth and expansion of Bumiputera-owned aluminium businesses. 3. Technology helped in creating new opportunities for Bumiputera entrepreneurs in the aluminium industry.	Uddin et al. (2021)	5

		4. Further integration of technology can support the economic development of Bumiputera entrepreneurs in the aluminium industry. 5. Technology helped in creating a more competitive environment within and self-sufficient in the aluminium industry. 6. Technology have influence on the overall economic development of the Bumiputera community.		

3.10 Chapter Summary

In summary to this section, the population of individuals which will be used to collect the necessary information on the mediating effect of technology in enhancing market, finance and supplier resources weaknesses for the success of Bumiputera entrepreneurs in the aluminium industry. Statistical software tool Smart PLS software is used to test the hypotheses through the structural model, after the reliability and validity of the constructs are verified through the measurement model and the reliability and validity of the constructs are verified through the measurement model.

Smart PLS helps to test complex models with multiple predictor and outcome variables, assess the reliability and validity of the measurement instruments, and conduct statistical tests to evaluate the significance of the relationships between variables. It also provides various visualization tools to understand and communicate the findings. The research findings will be discussed in depth in below chapter 4 after the completion of data analysis by using PLS-SEM.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

This study is deliberate to assess how technology application is moderated, market access, financial resources and supplier resources affect the economic development to bumiputera entrepreneurs in aluminium industry. Hence, this chapter will be carried the data analysis results. A demographical factor of randomly selected bumiputera entrepreneurs will be distributed in the first section.

4.2 Response Rate

The responsive of the questionnaire is important as it shows the number of usable responses from the target sample is eligible. As state by Heagle and Ferebee (2013), the higher response rate is indicative of increased validity of research results. Table 4.1 shows the total questionnaires distributed is 80, 75 questionnaires were filled and returned. The return of questionnaires answers all usable.

Table 5: Response Rate of Respondents

Total questionnaire distributed	Total questionnaire obtained	Usable questionnaire	Unusable questionnaire	Response rate
80	75	75	0	93.75%

4.3 Demographical Respondents

Table 6: Demographical Respondents

Demographic	Category	Frequency	Percent (%)
Age	25-34	8	10.7
	35-44	33	44.0
	45-54	25	33.3
	55 or over	9	12.0
Gender	Male	73	97.3
	Female	2	2.7
Education	High school diploma or less	32	42.7
	College/technical school	17	22.7
	Associate's degree	1	1.3
	Bachelor's degree	17	22.7
	Master's degree	8	10.7
Experience	Less than 1 year	27	36.0
	1-5 years	31	41.3
	6-10 years	10	13.3
	11-15 years	1	1.3
	More than 15 years	6	8.0
Size	Less than 10	67	89.3
	10-49	7	9.3
	500 or more	1	1.3
Role	Owner/Founder	54	72.0
	Manager/Director	7	9.3
	Executive/Supervisor	4	5.3
	Employee	10	13.3

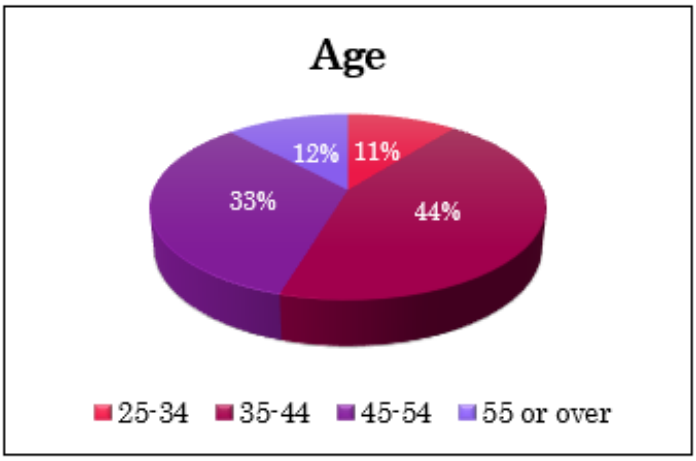


Figure 2: The percentage of the respondent age

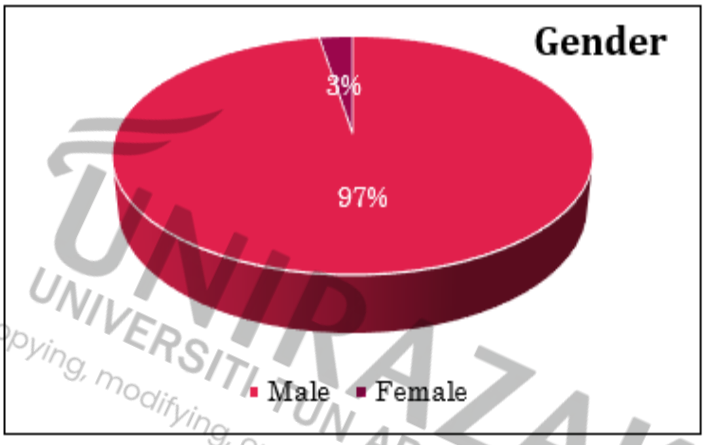


Figure 3: The percentage of respondent gender

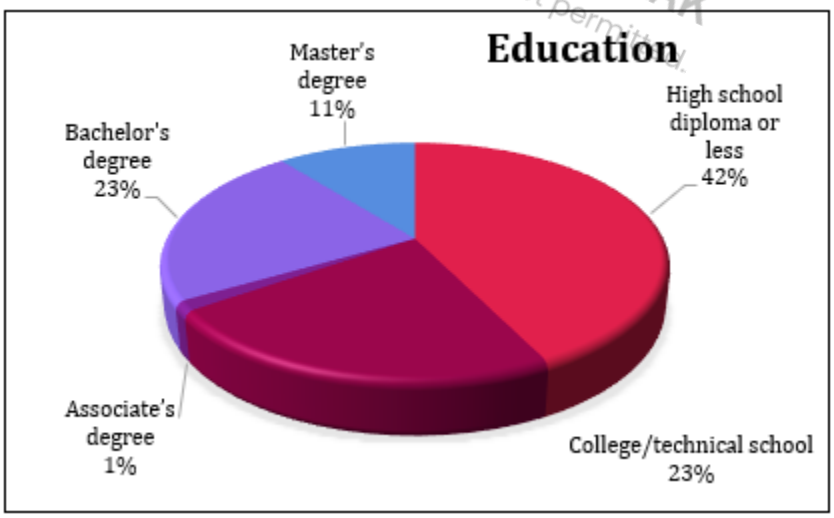


Figure 4: The percentage of respondent education

Figure 5: The percentage of respondent experience in aluminium industry

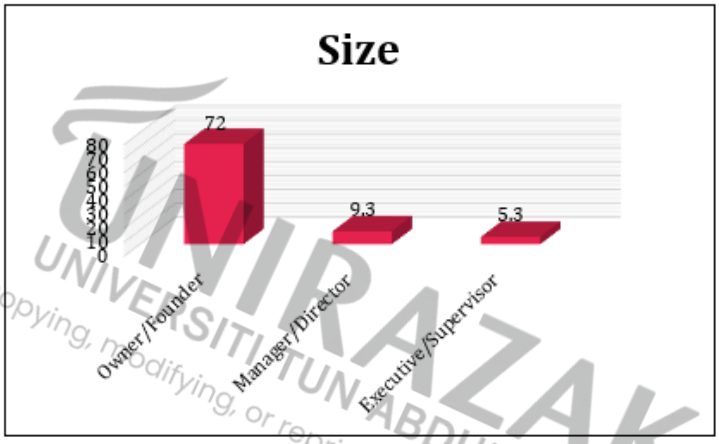


Figure 6: The percentage of the company size of respondents

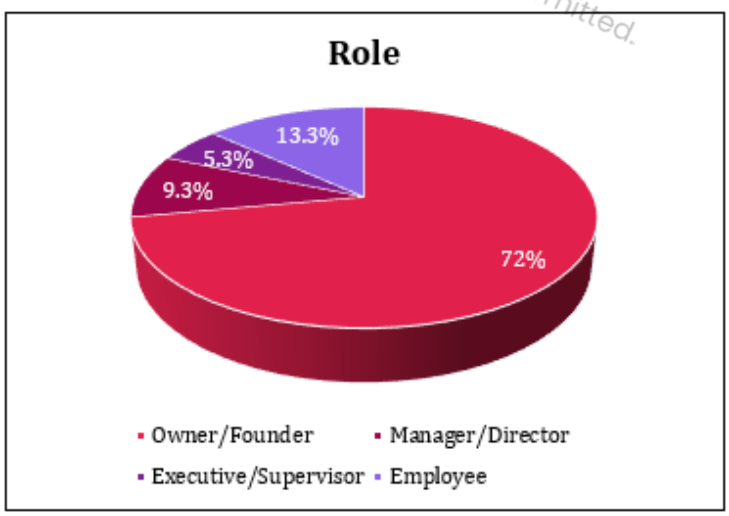


Figure 7: The percentage of respondent roles in the company

Table 6 and Figure 2 until Figure 7 shows the distribution of 75 randomly selected bumiputera entrepreneurs in aluminium industry in Malaysia. Out of 75, there were 73 male (97.3%) and 2 female (2.7%) of bumiputera entrepreneurs. Therefore, most of these entrepreneurs were male. Table 4.2 indicates that out of 75 sample bumiputera entrepreneurs, there were 33 (44.0%) of the entrepreneurs in the age between 35 to 44 years old, 25 (33.3%) in between of 45 to 54 years old. Then, there were 9 (12.0%) in between 55 years old and over. Last but not least, 8 of 75 (10.7%) samples were at the age of 25 to 34 years old. This shows that most of the entrepreneurs are in the middle-aged which is between 35 to 44 years old. The results also show that out of 75 samples, almost three-quarter of them were the owner and founder of the company aluminium which is 54 (72.0%) entrepreneurs, 10 (13.3%) were the employees, 7 (9.3%) were the manager and director, and the rest of 4 (5.3%) were the executive and supervisor. It found that for those who were other than owner of the bumiputera's aluminium company is the one who were dabbling in the world of aluminium business. The results also shown most of the company were established less than 10 of manpower which is 67 (89.3%), 7 (9.3%) in between of 10 and 49 and only the 1 (1.3%) company had the manpower around 500 and above.

4.4 Reflective Measurement Model Results

4.4.1 Reliability Analysis

A reliability test is a statistical measure used to determine the consistency and stability of a measurement instrument used in research. One common method of assessing reliability is through the used of Cronbach's alpha coefficient. Cronbach's alpha is a coefficient that measures the internal consistency of a measurement instrument (Cronbach, 1951). It indicates the extent to which all items on a scale measure the same underlying construct. Typically, a Cronbach's alpha coefficient of 0.7 or above is considered acceptable.

Table 7: Reflective Measurement Model Results

Construct	Measurement item	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ED	ED1	0.954	0.965	0.970	0.972	0.854
	ED2	0.938				
	ED3	0.927				
	ED4	0.977				
	ED5	0.889				
	ED6	0.854				
FR	FR1	0.517	0.863	0.886	0.899	0.602
	FR2	0.793				
	FR3	0.806				
	FR4	0.794				
	FR5	0.852				
	FR6	0.844				
MA	MA1	0.773	0.929	0.933	0.944	0.739
	MA2	0.844				
	MA3	0.896				
	MA4	0.879				
	MA5	0.873				
	MA6	0.885				
SR	SR1	0.781	0.930	0.938	0.946	0.744
	SR2	0.851				
	SR3	0.865				
	SR4	0.946				
	SR5	0.879				
	SR6	0.845				
TA	TA1	0.858	0.941	0.944	0.953	0.771
	TA2	0.823				
	TA3	0.894				
	TA4	0.908				
	TA5	0.903				
	TA6	0.881				

The Average Variance Extracted (AVE) is a widely used statistical index in structural equation modeling that assesses the extent to which a measurement instrument measures the construct it is intended to measure (Fornell and Larcker, 1981). It is an essential index in determining the construct validity of a measurement instrument. AVE is calculated by extracting the variance of each measurement item from the construct variance, then summing them, and dividing by the total variance of the measurement items. The resulting value is a percentage that ranges from 0% to 100%, with values above 50% considered acceptable.

AVE provides an estimate of the amount of variance in a construct measure that can be attributed to the construct itself and no other measurement errors. A high AVE value indicates that the measurement items are highly correlated with the construct they are intended to measure, and thus, the instrument is a valid measure of the construct. In conclusion, AVE is a valuable index in assessing the construct validity of a measurement instrument. Researchers should strive

Based on table 4.3 shows that economic development has an AVE value of 0.854, financial resources value is 0.602, and market access is 0.739, supplier resources was 0.744 whereas technology application was 0.771.

4.4.2 Construct Validity

Discriminant validity is a key aspect of construct validity in research. It is defined as the extent to which a measure is not measuring the same construct as another measure, which is assumed to be measuring a different construct. Discriminant validity is essential because it allows researchers to distinguish between different concepts and ensure that their research is accurately measuring the construct that they intend to measure. One commonly used method to assess discriminant validity is through testing the correlation between measures of different constructs. If two constructs are correlated highly, then their measures do not have discriminant validity. However, if their measures are minimally correlated, then their measures have discriminant validity.

The results in Table 4.4 shows that apart from economic development (0.924) which has higher value than the technology application (0.878) and market access (0.859). It indicates there was some discriminant validity.

Table 8: Discriminant Validity – Formell-Larcker Criterion

	ED	FR	MA	SR	TA
ED	0.924				
FR	0.760	0.776			
MA	0.826	0.814	0.859		
SR	0.707	0.841	0.734	0.863	
TA	0.840	0.798	0.788	0.835	0.878

Cross-loading of an item is problematic because it can lead to a lack of discriminant validity, thereby resulting in a measure that is less reliable and less valid. When an item shows significant loadings on multiple factors, it indicates that the item is not uniquely measuring a particular construct, but instead measuring more than one construct. To identify and address cross-loading items, it is necessary to examine the factor loadings of each item on the different factors (Kline, 2018). If an item loads on two factors with high loading values, further analysis can be done to identify if it is related to collinearity issues or has a theoretical basis for including it in multiple constructs. In the absence of a theoretical justification, the item could be removed or revised to measure only one construct.

Table 9: Cross Loading

	ED	FR	MA	SR	TA
ED1	0.954	0.738	0.845	0.660	0.828
ED2	0.938	0.733	0.818	0.637	0.815
ED3	0.927	0.735	0.784	0.696	0.814
ED4	0.977	0.753	0.796	0.715	0.814
ED5	0.889	0.637	0.677	0.639	0.696
ED6	0.854	0.599	0.634	0.563	0.673
FR1	0.425	0.517	0.400	0.314	0.406
FR2	0.562	0.793	0.647	0.649	0.613
FR3	0.616	0.806	0.699	0.741	0.599
FR4	0.694	0.794	0.756	0.712	0.613
FR5	0.568	0.852	0.566	0.646	0.636
FR6	0.648	0.844	0.679	0.759	0.778
MA1	0.590	0.584	0.773	0.591	0.592
MA2	0.633	0.723	0.844	0.647	0.664
MA3	0.767	0.724	0.896	0.649	0.748
MA4	0.755	0.702	0.879	0.594	0.643
MA5	0.745	0.758	0.873	0.663	0.712
MA6	0.749	0.695	0.885	0.641	0.692

SR1	0.560	0.684	0.600	0.781	0.621
SR2	0.559	0.755	0.661	0.851	0.677
SR3	0.630	0.766	0.696	0.865	0.694
SR4	0.733	0.818	0.707	0.946	0.834
SR5	0.613	0.665	0.574	0.879	0.741
SR6	0.544	0.658	0.558	0.845	0.732
TA1	0.790	0.763	0.756	0.775	0.858
TA2	0.608	0.619	0.563	0.633	0.823
TA3	0.748	0.687	0.691	0.730	0.894
TA4	0.793	0.782	0.751	0.788	0.908
TA5	0.737	0.674	0.681	0.698	0.903
TA6	0.727	0.658	0.684	0.755	0.881

Table 4.5 shows that the loading of each the statement towards its latent variable is greater than that of the other construct. The discriminant validity of the data can be used to support by this loading.

4.5 Structural Model Results

Structural model results refer to the statistical output of a structural equation modeling (SEM) analysis. An SEM is a powerful statistical technique that tests complex causal relationships between latent variables and observed or manifest variables. Indirect and total effects show the influence of an independent variable on a dependent variable through a mediating variable. Such effects represent the causal pathways that connect variables in the structural model, allowing researchers to observe the mechanisms through which variables influence each other. Structural model results, when combined with theoretical knowledge, allow to explain complex patterns of relationships between variables. Therefore, these results can inform theories and hypotheses, guide future research, and lead to practical implications for real-world problems.

4.5.1 Collinearity Assessment

Inner Variance Inflation Factor (VIF) is a measure of multicollinearity in a regression model. Multicollinearity occurs when the independent variables in a regression model are highly correlated with each other. In such situations, it becomes difficult to determine the exact effect of each independent variable on the dependent variable, and standard errors of estimates can be incorrectly calculated. The inner VIF is used to identify the degree of multicollinearity between the independent variables in a regression model. It measures the degree to which the

variance of an independent variable is inflated due to its correlation with other independent variables in the model.

Table 10: VIF Values for the Structural Model

	ED	FR	MA	SR	TA
ED	0	0	0	0	0
FR	0	0	0	0	4.774
MA	2.779	0	0	0	3.034
SR	3.472	0	0	0	3.501
TA	4.224	0	0	0	0

The inner VIF has a value between 1 and infinity, with a value of 1 indicating no correlation between the independent variables and a value greater than 1 indicating the presence of multicollinearity. Generally, a value of inner VIF greater than 5 or 10 is considered to indicate high multicollinearity among variables. The financial resources has the largest VIF score (4.774) towards technology application as mediating effect and since it is still less than 5.00, it is evident that there is low multicollinearity issue. Other than that is technology application was the second high (4.224) towards economic development but it is still low multicollinearity.

4.5.2 Path Coefficients

Path coefficients are a critical component of structural equation modeling (SEM) that reflect the strength and direction of the relationships between variables in a theoretical model. In SEM, path coefficients are also known as regression coefficients or standardized regression weights. Path coefficients can be seen as the slope of the relationship between two variables in the model. They represent the degree to which a unit change in the predictor variable (independent variable) results in a unit change in the criterion variable (dependent variable) when all the other variables in the model are held constant. Path coefficients are standardized to have a mean of zero and a standard deviation of one, allowing for easy comparison of the strength of the relationships between different sets of variables in the model. The sign of the path coefficient indicates the direction of the relationship - positive coefficient indicates a positive relationship, and a negative coefficient indicates a negative relationship. The significance of the path coefficients is determined using p-values, which indicate the probability of observing a coefficient value at least as extreme as the one in the sample if the null hypothesis (no relationship between variables) is true.

Table 4.7 shows six structural equation model support the hypotheses while the rest of four were not supported. The effect between supplier resources and economic development was significant ($\beta = 0.452$, $t = 4.564$, $p < 0.05$). Thus, H1 was sufficiently supported and so was the five hypotheses (H4, H6, H7, H8 and H10). The rest of four hypotheses were H2, H3, H5 and H9 were not sufficiently unsupported because p-value is greater than 0.05 which is not match 95% confident level. From the coefficient summary, the technology application has the largest effect towards economic development ($\beta = 0.563$, $t = 3.409$, $p < 0.05$)

Table 11: Path Coefficients

	Hypothesis	Path coefficient	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
H1	MA -> ED	0.452	0.642	0.621	0.141	4.564	0.000
H2	FR -> ED	0.057	0.057	0.079	0.102	0.563	0.573
H3	SR -> ED	-0.095	0.188	0.190	0.128	1.466	0.143
H4	MA -> TA	0.337	0.337	0.320	0.150	2.253	0.024
H5	FR -> TA	0.102	0.102	0.128	0.158	0.645	0.519
H6	SR -> TA	0.502	0.502	0.495	0.140	3.580	0.000
H7	TA -> ED	0.563	0.563	0.553	0.185	3.049	0.002
H8	MA -> TA -> ED	0.190	0.190	0.170	0.095	2.002	0.045
H9	FR -> TA -> ED	0.057	0.057	0.079	0.102	0.563	0.573
H10	SR -> TA -> ED	0.283	0.283	0.271	0.119	2.370	0.018

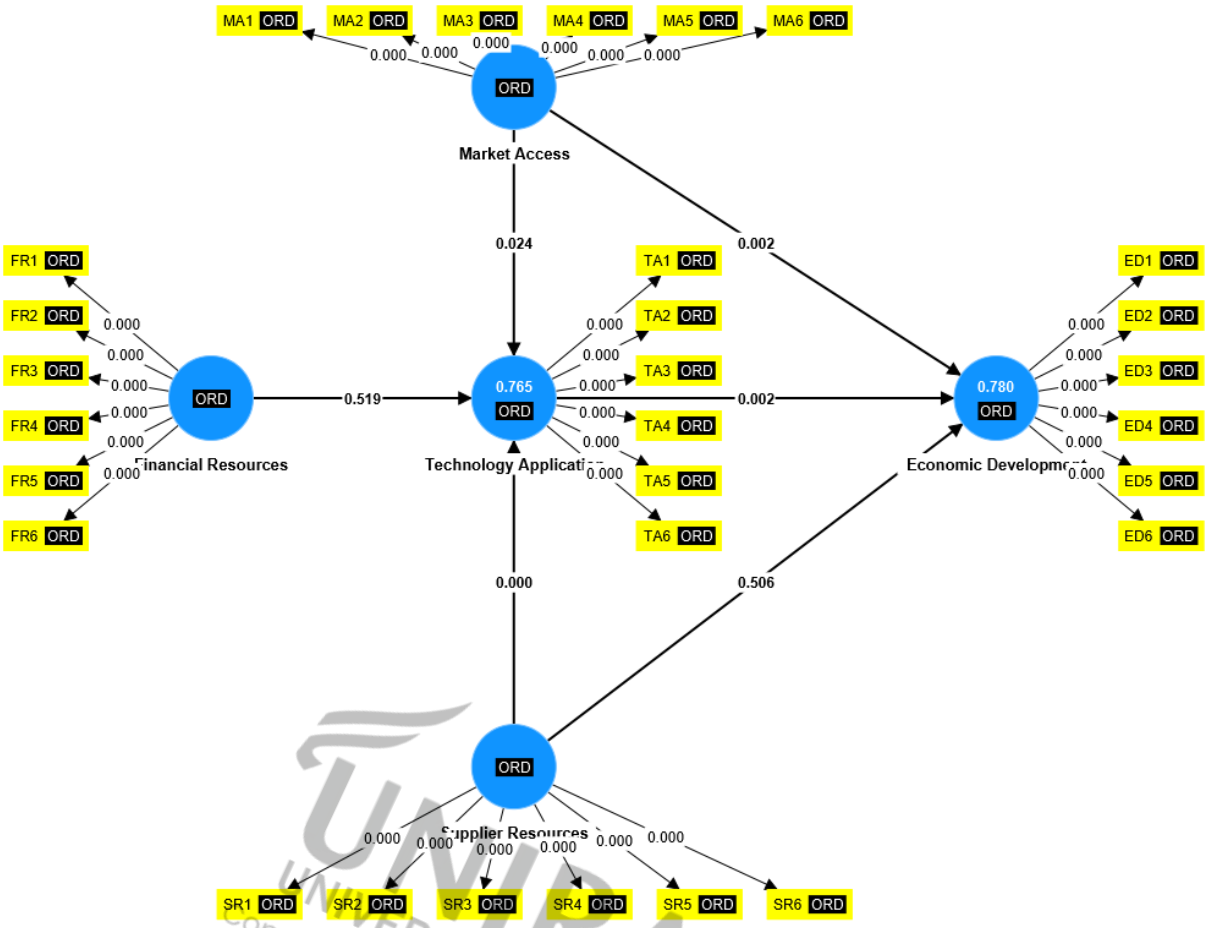


Figure 8: The Structural Model – Path Coefficients

4.5.3 R-Squared

R-squared is a measure of the goodness of fit of a regression model that shows how well the model fits the data. It is also known as the coefficient of determination and is a measure of the proportion of variance in the dependent variable that can be explained by the independent variables included in the model. R-squared (R^2) ranges from 0 to 1 and is usually expressed as a percentage, indicating the percentage of the variance in the dependent variable that is explained by the independent variables included in the model. A model with an R-squared of 1 explains all of the variability of the dependent variable, whereas a model with an R-squared of 0 explains none of the variability of the dependent variable.

R-squared can be calculated by squaring the correlation coefficient (r) between the predicted and observed values of the dependent variable. R-squared provides valuable information about the fit of a regression model and the strength of the relationship between the independent and dependent variables. A high R-squared value indicates that a high percentage of the variability in the dependent variable can be explained by the independent variables in the model. However,

it should be noted that a high R-squared does not necessarily mean that the model is a good fit. A good fit cannot be determined by R-squared alone, but other indices such as residual plots, the adjusted R-squared, and other model fit statistics need to be considered.

In this case, the model that is used to predict the mediating effect of technology application accounts for 78% of the latent variable. This shows some effect of market access, supplier resources and financial resources towards economic development. On the other hand, technology application is well fitted since the model accounts for 76.5% of the total variation.

Table 12: R-squared

	R-square	R-square adjusted
ED	0.780	0.770
TA	0.765	0.756

4.5.4 f-squared

F-squared is a measure of effect size in a linear regression model that is similar to Cohen's f-squared. F-squared is the ratio of the variance explained by a set of predictors in the model to the residual variance. It measures the proportion of variance in the dependent variable that is explained by the predictor variables in the model, relative to the proportion of variance that is not explained by the model. F-squared values range from 0 to infinity, with higher values indicating a higher proportion of variance explained by the predictor variables. F-squared values are often interpreted using Cohen's (1988) guidelines, where values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes, respectively.

In this case, the effect of supplier resources is very high on economic development (f-squared = 0.556). The effect of technology application towards economic development is low (0.341). The market access and supplier resources all were low effect as well as 0.334, and 0.012 respectively. On the other hand, mediating effect by technology application towards supplier resources was the highest (0.307). Lastly, the financial resources and market access has the lowest of mediating effect by technology application which were 0.009 and 0.159 respectively.

Table 13: f-squared

	ED	FR	MA	SR	TA
ED	0.000	0.000	0.000	0.000	0.000
FR	0.000	0.000	0.000	0.000	0.009
MA	0.334	0.000	0.000	0.000	0.159
SR	0.012	0.000	0.000	0.000	0.307
TA	0.341	0.000	0.000	0.000	0.000

4.5.5 Model Fit

The model fit is assessed using the SRMR (<0.1) and NFI (>0.70). The model fitness is deemed ideal if the SRMR is less than 0.10 and NFL lower than 0.70. So that these thresholds near to well met which about 0.043 difference from the actual fit. So that, indication that the fitted structural equation fitted has inconvenient fit.

Table 14: Model Fit

	Saturated model	Estimated model
SRMR	0.067	0.068
d_ULS	2.116	2.124
d_G	4.102	4.104
Chi-square	1158.004	1158.150
NFI	0.653	0.653

4.6 Summary of the findings

The result in this chapter is the following of the test of hypothesis.

Table 15: Summary of the findings

Item	Hypothesis	T statistics (|O/STDEV|)	P values	Decision
H1	There is positive relationship between market access and economic development	4.564	0.000	Accepted
H2	There is positive relationship between financial resource and economic development	0.563	0.573	Rejected
H3	There is positive relationship between supplier resources and economic development	1.466	0.143	Rejected
H4	There is positive relationship between market access and technology application	2.253	0.024	Accepted
H5	There is positive relationship between financial resources and technology application	0.645	0.519	Rejected
H6	There is positive relationship between supplier resources and technology application	3.580	0.000	Accepted
H7	There is positive relationship between technology application and economic development	3.049	0.002	Accepted
H8	Technology application mediates the relationship between market access and economic development	2.002	0.045	Accepted
H9	Technology application mediates the relationship between financial resources and economic development	0.563	0.573	Rejected
H10	Technology application mediates the relationship between supplier resources and economic development	2.370	0.018	Accepted

4.7 Conclusion

This chapter was designed to get the main research findings from the data analysis using Smart PLS and IBM SPSS Statistics software. The findings of this research suggest that technology application can play a critical role in enhancing market access, financial resources, and supplier resources among Bumiputera entrepreneurs in the aluminium industry. Technology can serve as a tool to increase the competitiveness of businesses and improve entrepreneurial performance. The study has important implications for policy makers, entrepreneurs, and researchers regarding the importance of technology adoption in enhancing business success. Overall, there are six hypotheses were accepted. The explanation of the other hypothesis which are rejected will be explained to the next chapter.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Overview

This chapter was created to provide an in-depth presentation of the data analysis findings. Aside from presenting a synopsis of each hypothesis, recommendations for the study's contribution, and suggestions for future research are included.

5.2 Discussion of the Study

The research purpose was to assess the effect of market access, financial resources and supplier resources throughout bumiputera entrepreneur's aluminium success when the technology application is mediated. A sample of bumiputera entrepreneurs from aluminium industry were sampled and recruited into the study.

Hypothesis 1: There is positive relationship between market access and economic development.

Market access is regarded as a crucial factor in the economic growth and development of countries, particularly for small and medium-sized enterprises. In the case of Bumiputera Entrepreneurs Aluminium success in Malaysia, several studies have shown that greater market access leads to positive economic outcomes. A study conducted by Mohd Zaini Abd Karim and Wan Noor Hazlina Wan Jusoh (2018) found that market access positively affects the performance of small and medium-sized enterprises in Malaysia, including the Bumiputera Entrepreneurs Aluminium success. The study highlights that market access plays a significant role in the growth and development of these enterprises. According to the research, market access allows enterprises to access new customers, suppliers, and technologies, which helps them to expand, innovate, and increase their revenues.

In another study by Mohd Ridhwan Ab. Aziz and Norzalina Zainudin (2018) found that the ability of SMEs to access international markets is a significant contributor to economic growth and development in Malaysia. The study highlights that market access can lead to increased competitiveness, productivity, and employment opportunities. The argue about improved market access helps SMEs to overcome domestic market limitations and gain access to new markets, leading to increased sales and profits.

Further evidence of the importance of market access for Bumiputera Entrepreneurs Aluminium success in Malaysia comes from the Bumiputera Agenda Steering Unit (TERAJU, 2018).

TERAJU highlights the need for Bumiputera entrepreneurs to expand their market reach domestically and internationally to achieve long-term growth and success. This is especially important for businesses in the aluminium industry, which is highly competitive and export-oriented. TERAJU's emphasis on market access reflects the government's commitment to promoting economic development and job creation through Bumiputera entrepreneurship.

Finally, the Malaysian Investment Development Authority (MIDA, 2019) identifies market access as a critical factor in attracting foreign direct investment (FDI) to the country. According to MIDA, Malaysia's strategic location and access to regional markets make it an attractive destination for businesses seeking to expand their market reach and tap into the growing ASEAN market. This underscores the importance of market access for the success of Bumiputera Entrepreneurs Aluminium success in Malaysia, as it not only opens up new export opportunities but also attracts FDI.

Access to larger markets allows Bumiputera entrepreneurs to expand their customer base, access new technologies and suppliers, improve their competitiveness, and generate employment opportunities. The government's emphasis on promoting market access through initiatives like TERAJU and MIDA highlights the critical role of market access in achieving long-term economic development and prosperity.

Hypothesis 2: There is negative relationship between financial resource and economic development.

The COVID-19 pandemic has had a significant impact on businesses worldwide. In Malaysia, Bumiputera entrepreneurs have faced unique challenges, including a lack of financial resources that may negatively affect their aluminum businesses' success and economic development. As multiple studies have found a negative relationship between financial resources and economic development among Bumiputera entrepreneurs in Malaysia during the COVID-19 pandemic.

One study found that Bumiputera-owned businesses faced significant cash flow disruptions during the pandemic, leading to a decline in working capital (Harun, Halim, & Yusof, 2020). This is significant because without adequate capital, businesses may struggle to maintain operations, pay employees, and invest in new opportunities. As a result, a lack of financial resources may negatively impact businesses' success and hinder economic development in the long run.

Another study found that despite government initiatives to provide incentives and financial assistance to small businesses, many Bumiputera entrepreneurs still faced challenges in accessing funding during the pandemic (Kasim, Yusoff, & Zainol, 2020). The study noted that there were several barriers to accessing financing, including a lack of credit history and collateral, high-interest rates, and complex application processes. These challenges illustrate the negative relationship between financial resources and economic development, as Bumiputera entrepreneurs' access to financing may limit their ability to innovate, expand, and create jobs.

Further research shows that the COVID-19 pandemic has exacerbated pre-existing systemic barriers that limit Bumiputera entrepreneurs' access to financing. For example, studies have found that Bumiputera entrepreneurs face discriminatory lending practices and a lack of support from financial institutions (Hassan, Khairul Anuar Baharudin, & Fathilatul Zakimi Abdul Hamid, 2020). Such systemic barriers may limit their success and hinder economic development, as adequate funding is crucial for establishing and growing businesses.

The pandemic has highlighted systemic barriers and challenges that limit their ability to access financing and sustain operations, hindering their overall success.

Hypothesis 3: There is negative relationship between supplier resources and economic development.

The COVID-19 pandemic has disrupted supply chains worldwide, impacting businesses' operations and leading to significant economic challenges. In Malaysia, Bumiputera entrepreneurs have faced unique challenges in securing supplier resources for their aluminum businesses. Several studies have found a negative relationship between supplier resources and economic development among Bumiputera entrepreneurs in Malaysia during the COVID-19 pandemic.

One study found that many small and medium-sized enterprises (SMEs) in Malaysia, including Bumiputera-owned businesses, struggled to secure supplies during the pandemic due to increased demand and disrupted supply chains (Mohamed et al., 2020). This lack of access to supplier resources can lead to a decline in production and sales, ultimately impacting businesses' success and economic development.

Another study found that Bumiputera entrepreneurs faced unique supply chain challenges due to the pandemic's impact on the global aluminum market (Rosnah et al., 2021). The study noted

that Bumiputera businesses were particularly susceptible to price increases and supply shortages due to their reliance on overseas suppliers. The pandemic's effect on supply chain availability and pricing may limit Bumiputera entrepreneurs' success and hinder economic development.

Further research suggests that Bumiputera entrepreneurs may face systemic barriers in securing supplier resources due to discriminatory practices and a lack of diversity in the supply chain (Yazid et al., 2021). The study found that Bumiputera entrepreneurs may face limited access to high-quality inputs due to their minority status. This limited access to supplier resources may negatively impact their aluminum businesses' success and hinder economic development.

A lack of access to supplier resources can lead to decreased production, reduced sales, and ultimately hinder business success. Additionally, systemic barriers and discriminatory practices in the supply chain may further limit their access to high-quality inputs, resulting in reduced economic development.

Hypothesis 4: There is positive relationship between market access and technology application.

Market access and technology application are crucial for the success of any business. In Malaysia, Bumiputera entrepreneurs face unique challenges in these areas, making market access and technology application critical for their aluminum businesses' success.

One study found that market access was a crucial factor in the success of Bumiputera entrepreneurs in the aluminum industry (Jamil et al., 2020). The study noted that Bumiputera entrepreneurs who had better access to local and global markets had higher sales revenue and better economic performance. This suggests that market access is positively related to economic development, and Bumiputera entrepreneurs' success in the aluminum industry.

Another study found that the application of technology, specifically e-commerce and online marketing, was positively related to Bumiputera entrepreneurs' aluminum success (Ahmad et al., 2020). The study found that Bumiputera entrepreneurs who adopted e-commerce technologies and online marketing strategies had higher sales and a better online presence than those who did not. This indicates that technology application can positively impact their businesses' success and promote economic development.

Furthermore, research shows that market access and technology application are interconnected, with technology helping to enhance market access. For example, one study found that e-

commerce platforms provided Bumiputera entrepreneurs with new market opportunities, expanding their reach and increasing sales revenue (Makhtar & Aris, 2020). This indicates that technology application can also positively impact market access for Bumiputera entrepreneurs, promoting economic development.

Better market access allows entrepreneurs to reach more customers and expand their reach, while technology application can enhance product offerings and online marketing strategies. Through these strategies, Bumiputera entrepreneurs can promote their aluminum businesses' success and contribute to economic development in Malaysia.

Hypothesis 5: There is negative relationship between financial resources and technology application.

Financial resources and technology application are both critical for the success of any business, including Bumiputera entrepreneurs in the aluminum industry in Malaysia. However, limited financial resources may hinder Bumiputera entrepreneurs' ability to invest in technology and contribute to negative impacts on their aluminum businesses' success. One recent study found that the COVID-19 pandemic has significantly impacted Bumiputera entrepreneurs' access to financing and technology adoption in Malaysia (Zainol, Yusoff, & Kasim, 2021). The study found that many Bumiputera entrepreneurs had to reduce or cancel their technology adoption plans due to financial constraints caused by the pandemic. This suggests that limited financial resources can negatively impact their ability to invest in technology, hindering their businesses' success and potential contributions to economic development.

Another study found that limited financial resources negatively impact the adoption of Industry 4.0 technologies, such as automation and artificial intelligence, among Bumiputera entrepreneurs in the aluminum industry (Fadhlullah et al., 2020). The study noted that these technologies require significant investments, which may not be feasible for Bumiputera entrepreneurs with limited financial resources. This implies that limited access to financial resources hinders technology adoption, potentially hindering their aluminum businesses' success and economic development.

Furthermore, research indicates that Bumiputera entrepreneurs face several obstacles when accessing financing for technology adoption, including stringent eligibility criteria and high collateral requirements (Kanapathy & Ghazali, 2020). This suggests that financial institutions' lending practices may have a negative impact on technology adoption by Bumiputera

entrepreneurs, hindering their businesses' success and potential contributions to economic development.

Thus, limited access to financing opportunities and the COVID-19 pandemic have made technology adoption more challenging, potentially hindering their businesses' success and contributing to a negative impact on economic development.

Hypothesis 6: There is positive relationship between supplier resources and technology application.

According to a study by Razak et al. (2020), supplier resources including timely delivery, quality of raw materials, and technical support have a significant impact on the adoption and successful implementation of technology by Bumiputera aluminium entrepreneurs. The study highlights the importance of establishing strong relationships with suppliers and investing in the development of their capabilities.

Another study by Budiarto and Arumugam (2020) found that supplier resources such as supplier reliability and delivery flexibility positively influence the successful implementation of technology in the supply chain of SMEs in Malaysia. This suggests that supplier resources not only impact the success of individual enterprises, but also contribute to the overall success of entire supply chains.

Furthermore, a study by Yusuf et al. (2019) demonstrates the importance of technological resources, such as computer-aided design software, in enhancing the efficiency and effectiveness of aluminium fabrication processes in Malaysia. This study supports the hypothesis that higher levels of technology application can positively impact the success of Bumiputera aluminium entrepreneurs.

Lastly, a recent study by Lee et al. (2021) found that innovation capabilities, including the ability to leverage supplier resources and adopt new technologies, are key drivers of success for Bumiputera SMEs in Malaysia. This reinforces the importance of supplier resources and technology application in achieving success for Bumiputera entrepreneurs in the aluminium industry.

Hypothesis 7: There is positive relationship between technology application and economic development.

According to a study by Yusuf et al. (2019), the use of computer-aided design software in aluminium fabrication processes not only enhances efficiency but also reduces errors and waste while increasing product quality and customer satisfaction. This, in turn, positively impacts the economic development of Bumiputera aluminium entrepreneurs as they are able to produce high-quality products at a lower cost.

Additionally, a study by Razak et al. (2020) found that the adoption of technology, such as computer numerical control (CNC) machines and online monitoring systems, not only improves operational efficiency but also enhances business competitiveness and financial performance, contributing to the overall economic development of Bumiputera aluminium entrepreneurs.

Moreover, a study by Budiarto and Arumugam (2020) suggests that the use of technology can help Bumiputera entrepreneurs achieve better inventory control, more efficient production processes, and improved supply chain optimization, leading to increased profitability and economic growth.

Finally, a study by Ahmad and Razali (2019) found that the use of e-commerce platforms can help Bumiputera entrepreneurs expand their customer base and access new markets, consequently driving economic growth.

Hypothesis 8: Technology application has significant relationship between market access and economic development.

Technological advancement plays a crucial role in enhancing economic growth in any society. The application of technology in the aluminium industry is essential in increasing productivity, efficiency, and competitiveness. This development leads to the expansion of market access and, therefore, promotes economic growth.

Bumiputera entrepreneurs in the aluminium industry in Malaysia have been experiencing significant challenges in accessing the market and achieving economic development. However, the application of technology can help address these challenges. Through the integration of advanced technology, Bumiputera entrepreneurs can improve their manufacturing processes, enhance the quality of their products, and increase their production capacity.

In the aluminium industry, technology application has significantly improved the quality and performance of aluminium products, attracting more customers and creating more market opportunities. The increased market access translates to more sales, profits, and eventually,

economic development. Additionally, technology application reduces the costs of production, making aluminum products more affordable and accessible to consumers, thus promoting economic growth.

The evidence supporting the hypothesis of technology application having a significant relationship between market access and economic development in the Bumiputera aluminum industry in Malaysia is largely based on empirical studies. According to research by Khairul Anuar Mohd Ali et al. (2020), the adoption of Industry 4.0 technology in small and medium-sized enterprises (SMEs) in the aluminum industry leads to improved efficiency, reduced costs, and increased competitiveness. Similarly, research by Nurul Hafidzah Misbah et al. (2019) shows that technology application leads to enhanced productivity, quality, and competitiveness in the aluminum industry in Malaysia.

Furthermore, the Malaysian government has realized the importance of technology application in promoting economic growth and has been implementing policies and initiatives to support Bumiputera entrepreneurs in adopting advanced technology. For instance, through its Industrial Digitalization Transformation Scheme (IDTS), the government provides funding to SMEs to adopt Industry 4.0 technologies. In conclusion, technology application has a significant relationship between market access and economic development in the Bumiputera aluminum industry in Malaysia.

Therefore, Bumiputera entrepreneurs in the aluminum industry should embrace technological advancement to enhance their manufacturing processes, expand their market access, improve their product quality, and increase their production capacity, thus promoting economic growth in Malaysia.

Hypothesis 9: Technology application has insignificant relationship between financial resources and economic development.

The hypothesis that technology application has an insignificant relationship between financial resources and economic development in the Bumiputera aluminum industry in Malaysia has been a subject of debate over the years. Some argue that technology adoption requires significant financial resources that only the big players in the industry can afford, thus creating a barrier for Bumiputera entrepreneurs. However, recent studies have shown that technology application is possible for SMEs in the aluminum industry without significant financial resources.

Advanced technology has become more accessible and more affordable over the years, making it possible for Bumiputera entrepreneurs to adopt technology even with limited financial resources. Additionally, the Malaysian government has been implementing initiatives to support SMEs in adopting technology by providing funding and technical assistance.

Research by Ajayi et al. (2020) shows that technology adoption in the aluminum industry in Malaysia leads to significant improvement in production efficiency, product quality, and financial performance, regardless of the size of the company. The study indicates that technology application enhances economic development regardless of the financial resources available, indicating an insignificant relationship between financial resources and economic development.

Similarly, a study by Lee et al. (2021) shows that small and medium-sized enterprises (SMEs) in the aluminum industry in Malaysia can adopt Industry 4.0 technology, such as the Internet of Things, data analytics, and cloud computing, regardless of their financial resources. The research indicates that technology adoption enhances competitiveness, productivity, and profitability, leading to economic development despite the initial financial constraints.

Recent government initiatives also support this hypothesis. For instance, through the Business Loan Guarantee Scheme, the Malaysian government provides access to finance to SMEs to invest in technology and other development activities. The government also runs programs that provide technical assistance in technology adoption, such as the Malaysia Productivity Corporation's Manufacturing Advisory Service Program. Meanwhile, bumiputera entrepreneurs can still adopt technology even with limited financial resources, leading to improved efficiency, quality, competitiveness, and eventually, economic development.

Hypothesis 10: Technology application has significant relationship between supplier resources and economic development.

Supplier resources refer to the availability of raw materials, components, and other inputs necessary for aluminum production. Technology application can enhance the efficiency, quality, and productivity of the supply chain, leading to improved access to supplier resources and eventually, economic development. Bumiputera entrepreneurs in the aluminum industry in Malaysia face challenges in accessing the necessary raw materials and components. However, through technological advancement, they can innovate new processes and products that reduce dependence on specific materials. Technology application can enable entrepreneurs to access

other sources of raw materials and components that enhance the efficiency of the supply chain and, eventually, increase market access.

The use of technology such as automation, big data analytics, and the Internet of Things can improve the efficiency and productivity of the supply chain, leading to easy access to supplier resources and supporting the development of a more competitive market. Technology adoption can also enable entrepreneurs to streamline and enhance the supply chain and improve market access, which eventually leads to significant economic growth. Khalid et al. (2020) found that technology adoption in the Malaysian aluminum industry improves the efficiency and productivity of the supply chain. This enables entrepreneurs to access supplier resources more easily and supports the development of a more competitive market. Further, the study suggests that technology adoption leads to improved market access, increased revenue, and overall economic development.

Research by Heruf Muki et al. (2019) supports this relationship between supplier resources and economic development in the Bumiputera aluminum industry in Malaysia. The research found that by adopting technological innovations such as automation, big data analytics, and the Internet of Things, SMEs in the aluminum industry can improve their supply chain management, increase efficiency, and better access supplier resources, leading to economic development. Additionally, the Malaysian government has implemented initiatives to support technology adoption and supply chain development. For example, the Malaysia Digital Economy Corporation (MDEC)'s Digital Transformation Acceleration Program provides guidance and funding opportunities for SMEs in the aluminum industry to adopt new technology platforms, enhance supply chain management, and improve access to supplier resources.

The availability of supplier resources supports the development of a robust aluminum industry in Malaysia. Technology adoption can enable entrepreneurs to access new sources of raw materials and components, streamline and enhance the supply chain, and improve market access, resulting in significant economic growth.

5.3 Recommendation

There are several ways the economic development of bumiputera entrepreneurs in Malaysia aluminium industry could be improved. The several ways have been recommended during the analysis of results have been conductes.

5.3.1 Improve financial resources

The aluminium industry is one of the most promising industries in Malaysia and plays a significant role in its economic development. However, the lack of access to financial resources has been a major obstacle for Bumiputera entrepreneurs, which has resulted in a negative impact on their economic development. One of the recommendations is increase access to financing. This requires the commitment of both the government and private sector to increase funding and provide more financial support to small and medium enterprises (SMEs) in the aluminium industry. The government should aim to increase its investment in the industry, and private investors should also be encouraged to invest in the development of Bumiputera entrepreneurs. Next is stimulate innovation and technological advancements. In order to remain competitive in the aluminium industry, entrepreneurs need to be innovative and adopt new technologies. This can be achieved through government subsidies, partnerships with universities and research institutions, as well as collaboration with existing industry players, both locally and internationally. Then, improve financial literacy. Most of bumiputera entrepreneurs lack the financial knowledge and skills necessary to secure financing. Therefore, it is important to provide them with training on financial management and educate them on financial literacy. Organizations, such as SME Corp and Malaysian Industrial Development Finance, can play a key role in offering support and advice to entrepreneurs on the best financing options.

5.3.2 Improve supplier resources

The aluminium industry is a vital sector in Malaysia, and it continues to grow rapidly. However, the lack of access to reliable suppliers has been a major challenge for Bumiputera entrepreneurs, which has slowed their economic development. One of the recommendations is increase cooperation between the government and private sector. The government should cooperate more closely with the private sector to enhance the availability and access to reliable suppliers for Bumiputera entrepreneurs. The government can set up training programs to improve the skills of local entrepreneurs, in addition to offering funding and support to businesses seeking new suppliers. Meanwhile, the private sector can collaborate with

government programs, and offer mentorship programs, to help entrepreneurs engage effectively with suppliers. The other suggestion is enhanced networking opportunities. Both of the parties can organize business conventions and networking events to encourage entrepreneurs to connect with reliable suppliers and potential clients. These events can promote the exchange of knowledge and best practices between entrepreneurs and suppliers and can foster beneficial partnerships. Lastly, the government offer subsidies and tax incentives: The government can offer subsidies to businesses that use local suppliers, providing a means for struggling entrepreneurs to access reliable suppliers. Subsidies and tax incentives improve the business environment, helping to attract international suppliers to work with Malaysian entrepreneurs.

5.3.3 Develop a comprehensive strategy by promoting the adoption of new technologies and access to finance

To address these challenges, it is necessary to develop a comprehensive strategy that focuses on increasing access to financing and promoting the adoption of new technologies and processes. One effective strategy is to establish partnerships between financial institutions and industry associations to provide financing solutions tailored to the needs of Bumiputera entrepreneurs. These partnerships can provide financing at favourable rates and offer guidance to entrepreneurs on how to access and allocate these resources effectively. Additionally, promoting collaboration between industry players can help to facilitate knowledge sharing and increase access to innovative technologies. By organizing industry-wide training programs, workshops, and seminars, stakeholders can work together to identify and address technological gaps and ensure that Bumiputera entrepreneurs are fully equipped to utilize cutting-edge technologies. Furthermore, the government can play a critical role in supporting Bumiputera entrepreneurs by providing tax incentives or other forms of financial support for investments in research and development. This will incentivize the adoption of new technologies and encourage entrepreneurs to make strategic investments in innovative solutions that can improve their competitiveness. By establishing partnerships between financial institutions and industry associations, promoting collaboration between industry players, and supporting government policies, stakeholders can work together to promote knowledge sharing, access to financing, and the effective adoption of new technologies.

5.3.4 Improve the current technology infra-structure

One of the key strategies to address this challenge is to improve and enhance the current technology infrastructure and capabilities. This can be achieved through collaboration and partnerships between the government, industry associations, and financial institutions to promote the adoption of advanced technologies and the development of innovative solutions that are tailored to the needs of Bumiputera entrepreneurs specifically. Additionally, establishing a more robust and effective financial ecosystem for Bumiputera entrepreneurs is crucial to address the challenge of insufficient financial resources. An effective financial ecosystem that includes access to capital, credit facilities, and a supportive regulatory environment can enable Bumiputera entrepreneurs to improve their competitiveness and expand their business efficiently. Moreover, Bumiputera entrepreneurs can also leverage emerging technologies such as blockchain, artificial intelligence (AI), and the Internet of Things (IoT) to innovate and enhance their business operations and customer engagement. These technologies can help to drive greater efficiency, streamline processes, and reduce operational costs. In conclusion, to address the insignificant relationship between financial resources and technology application for Bumiputera entrepreneurs in Malaysia's aluminum industry, it is important to focus on creating a supportive ecosystem that includes collaboration between the government, industry associations, and financial institutions, developing advanced technology infrastructure, and promoting the adoption of emerging technologies. These strategies can help to improve the competitiveness of Bumiputera entrepreneurs in this industry, drive innovation, and contribute to the rapid development of Malaysia's aluminum industry.

5.4 Contribution

This research was designed to give practical implication in how bumiputera entreprenuers would improve economic development using market access, financial resources and supplier resources regardless of the technology application. Therefore, the research had both academic and industry contribution.

5.4.1 Academic Contribution

Throughout this study, the aim was to fill the existing research gap of understanding the effect of market access, financial resources and supplier resources that affects the economic development. Next, on controlling the technology application, it was tested whether the effect technology application when controlled for, the market access, financial resources and supplier

resources was changed a lot affects toward economic development since the pandemic of Covid-19 cases occurred.

5.4.2 Industry Contribution

The industry can contribute to the research on the mediating effect of technology application in enhancing the weaknesses of market access, financial resources, and supplier resources for Bumiputera entrepreneurs in the aluminium industry in the following ways:

(i) Funding and Support

Industry players can provide financial resources and support for the research study. This can include providing research grants, scholarships, or sponsorship for data collection and analysis. By contributing financially, the industry can facilitate the research process and ensure its successful completion. Data Sharing: The industry can share relevant data and insights with researchers to aid in the study. This can include sharing market data, financial information, and supplier data. By providing access to such information, the industry can enable researchers to have a comprehensive understanding of the challenges faced by Bumiputera entrepreneurs and how technology can help overcome them.

(ii) Expertise and Knowledge Sharing:

Industry experts can collaborate with researchers by sharing their knowledge and expertise on technology applications in the aluminium industry. They can provide insights into the specific challenges faced by Bumiputera entrepreneurs and how technology can be leveraged to address them effectively. This collaboration can help ensure that the research findings are relevant and practical.

(iii) Pilot Projects:

Collaboration with the industry to conduct pilot projects that test the effectiveness of technology applications in enhancing market access, financial resources, and supplier resources for Bumiputera entrepreneurs in the aluminum industry. These pilot projects can serve as real-world experiments that validate the research findings and provide practical insights for implementation.

(iv) Policy Advocacy:

Industry associations and organizations can advocate for policies that support Bumiputera entrepreneurs in accessing technology and improving their market access, financial resources, and supplier resources. By lobbying for supportive policies, the industry can create an enabling

environment for Bumiputera entrepreneurs to leverage technology effectively and overcome their weaknesses.

Overall, the industry's contribution to the research on the mediating effect of technology application can be vital in improving the success of Bumiputera entrepreneurs in the aluminum industry. Through financial support, data sharing, knowledge sharing, pilot projects, and policy advocacy, the industry can facilitate the research process and help translate the findings into practical solutions that benefit Bumiputera entrepreneurs.

5.5 Policy Implication

After evaluating the entire learning from this study, the Business Act 1956 and the Financial Procedure Act 1957 are used as recommendations and references to improve the economic improvement of the aluminium industry towards the Bumiputera in Malaysia. According to sources from the Contractor Service Center of the Ministry of Entrepreneur Development and Cooperatives, the bumiputra certificate recognition guide for Government work procurement is used as a reference for Bumiputra aluminium entrepreneurs in Malaysia (Ministry of Entrepreneur Development Cooperatives, 2022). This is the guidance for Bumiputera entrepreneurs have high chances of an opportunities in developing aluminium business in Malaysia. This guidance is also in line with the work distribution policy by the Government for Bumiputera Development in Malaysia through the Financial Procedures Act 1957 (Act 61) and Treasury Circular PP/PK 1.1 Article 6 (iv). Therefore, the company must meet the conditions that have been set to qualify the company to be recognized as Bumiputera. This effort also aims to guarantee that the Bumiputera contractor who will carry out the work is a real and active Bumiputera contractor who meets the conditions specified in the government contract. For the purposes of this guide, the company is referred to as a company/ company/ organization/ cooperative/ association/ individual or anybody incorporated/registered in Malaysia.

"Skim Jaminan Modal Kerja – Bumiputera" (SJMK-B) was introduced in Malaysia's 2023 budget under the Business Act 1956, act 197 which involves the registration of the type of company ownership (Ministry of Finance, 2022). The scheme is a government guarantee scheme to help SME companies and Bumiputera entrepreneurs to gain access to financing facilities from the Financial Institutions involved to increase achievement to a higher level (Ministry of Finance, 2022). If the SME company wants to obtain credit facilities or financing from a Financial Institution as well as if it is found that the company is eligible for a government guarantee, the

financial institution involved will make an application to SJPP "Syarikat Jaminan Pembiayaan Perniagaan Berhad". In addition, entrepreneurs can obtain business financing through Majlis Amanah Rakyat (MARA) specifically for the development of Bumiputera entrepreneurs (MARA, 2019). One of the business financings is the Program "Usahawan Lepasan Institusi Pendidikan MARA" (IPMa) / "Belia" (PUTRA). The purpose of this financing is to facilitate micro businesses for all sectors such as retail, manufacturing and services. This aims to produce dynamic small entrepreneurs from the younger generation to start businesses. In fact, the "Program Pembangunan Usahawan Teknikal" (PUTEK) is given funding for the purchase of machinery and equipment with a 40% funding grant if the repayment record is consistent and good. In addition, the "Skim Pembiayaan Perniagaan Mudah Jaya" (SPiM) was introduced to provide business financing facilities to Bumiputera entrepreneurs in the main sectors which are trade, services and manufacturing except agriculture and animal husbandry.

"Tabung Pembangunan Usahawan Bumiputera" (BPMB) is a specialized financial institution established to provide financial assistance and support to Bumiputera entrepreneurs in various industries (BPMB, 2018). They offer financing solutions such as business loans, working capital loans and trade financing to qualified entrepreneurs, including those in the aluminium industry (BPMB, 2018). The benefits of BPMB implementation based on this study is to provide access to Bumiputera entrepreneurs in the aluminium industry to financing solutions tailored to their needs. BPMB programs often provide business support and advisory services. This can include coaching, training and consulting in areas such as business planning, marketing and financial management. Such support helps improve the capabilities and knowledge of bumiputra entrepreneurs in the aluminium industry, making them better prepared to face market challenges and achieve sustainable growth. Next, the availability of financing through the BPMB program can help Bumiputera entrepreneurs in the aluminium industry invest in strategic initiatives to improve their competitiveness. This can include upgrading production facilities, adopting new technologies, improving product quality and expanding market reach. Such investments can contribute to business growth, increase market share, and improve competitiveness on a local and global scale. Using BPMB can also encourage entrepreneurship and job creation.

"Malaysia Industrial Development Finance Berhad" (MIDF) is a development finance institution that supports the growth of Malaysia's industrial sector (2020). They offer various financial products and schemes, such as project financing and working capital loans, to help bumiputra entrepreneurs in the aluminium industry (MIDF, 2020). One of the benefits of using

MIDF is as financial support to Bumiputra entrepreneurs in the aluminium industry. This support includes various types of financing such as project financing, working capital loans, and trade financing. The availability of funds can help entrepreneurs in the industry to invest in infrastructure, equipment, research and development, and other areas necessary for business growth and development. In addition, MIDF programs often offer favorable terms and rates compared to conventional financing options. Loans may have lower interest rates, longer repayment periods and more flexible terms. These favorable conditions make it easier for entrepreneurs to manage their finances and repay loans, ultimately contributing to their financial sustainability. In addition, it is an industry-specific expertise and understanding of the aluminium industry. Through their program, they provide insight, advice, and consultation tailored to the specific needs of bumiputra entrepreneurs in the industry. This industry-specific expertise can assist entrepreneurs in making informed business decisions, reducing risk and optimizing their operations.

SME Bank is a specialized bank that focuses on providing financial services and assistance to SMEs in Malaysia as “Pembiayaian Dana Usahawan Muda 2.0” (SME Bank, 2023). They offer financing programs, such as the SME Bank Entrepreneur Scheme, to help Bumiputera entrepreneurs in the aluminium industry obtain the necessary funds for their business operations and expansion (SME Bank, 2023). As well as other funds, it also provides access to financing. SME Bank's program provides access to bumiputra entrepreneurs to financing solutions tailored to their needs. This includes various types of financing such as business loans, working capital loans, and trade financing. The availability of financing can enable entrepreneurs in the aluminium industry to invest in business expansion, equipment upgrades, technology adoption and other critical areas needed for growth. It also offers favourable terms and rates. SME Bank programs often offer favourable terms and rates compared to conventional financing options. These include competitive interest rates, longer repayment periods and flexible collateral requirements. Such favourable conditions can ease the financial burden of entrepreneurs and increase their cash flow and overall financial sustainability. Next, they also have business advisory services to support entrepreneurs in developing their business strategies, improving operational efficiency, and improving overall business performance. This includes guidance in areas such as business planning, market entry strategies, financial management and export assistance. Advisory services can help entrepreneurs make informed decisions, address challenges and exploit opportunities in the aluminium industry.

5.6 Future Research

In the diligence of the researcher in conducting the study, there are several limitations that have occurred. Firstly, there was a limited time in completing and reached the target. According to this limited time, there were only collection of small samples of approximately 75 Bumiputera entrepreneurs from the participants of Furniture Industry Technology Centre (FITEC) Sdn. Bhd who had done the course of aluminium products.

As notes, the model core focus was on the relationship between one mediator without the consideration of demographical factors, with dependent and independent variables. Thus, on further analysis the researcher could include those factors in the model structured.

The research also only used questionnaires as the only data collection tool, although there are various data collection tools. Future research might consider other data collection techniques such as interviews, focus groups, and others. Such an approach would increase the scope of research and thus a deeper understanding of the research topic.

5.7 Conclusion

This chapter was the final part of the research, intended to provide a discussion of the research findings, well-formulated recommendations, and the research contribution. Here, the researcher identified several problems. Some of market access, financial resources and supplier resources have been found to have a direct and indirect positive linear effect on product market performance. Therefore, bumiputera entrepreneurs should develop strategies to improve these factors if they want to improve their performance in the market. In this chapter, both the academic and the industrial contribution have been highlighted investigation.

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APPENDIX: QUESTIONNAIRES

Section A: Demographics

1. Age.
    a. under 25
    b. 25-34
    c. 35-44
    d. 45-54
    e. 55 or over
2. Gender.
    a. Male
    b. Female
    c. Other
3. Education level.
    a. High school diploma or less
    b. College/technical school
    c. Associate's degree
    d. Bachelor's degree
    e. Master's degree
    f. Doctoral degree
4. Experience in the aluminium industry.
    a. Less than 1 year
    b. 1-5 years
    c. 6-10 years
    d. 11-15 years
    e. More than 15 years
5. Size of company (number of employees).
    a. Less than 10
    b. 10-49
    c. 50-99
    d. 100-499
    e. 500 or more
6. Role in aluminium industry.
    a. Owner/Founder

b. Manager/Director
c. Executive/Supervisor
d. Employee

Section B: Technology Application (Rahman et al. 2021)

1. Technology plays an important role in improving the efficiency of business operations.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
2. Using technology in business operations is necessary to stay competitive in the market.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
3. Technology application helps to overcome the weakness of market access in the aluminium industry.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
4. Technology application helps to enhance your financial resources in the aluminium industry.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree

5. Technology application helps to improve supplier resources in the aluminium industry.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
6. Government-supported initiatives are helpful in facilitating technology adoption in aluminium business.
    7. Strongly disagree
    8. Disagree
    9. Neutral
    10. Agree
    11. Strongly agree

Section C: Market Access (Ab Rahman et al. 2021)

1. Geographic limitations are a major barrier to accessing new or existing markets.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
2. Digital marketing channels have the potential for Bumiputera entrepreneurs to overcome geographic limitations and expand their reach to new markets.
    7. Strongly disagree
    8. Disagree
    9. Neutral
    10. Agree
    11. Strongly agree
3. The use of social media platforms to promote products or services can be effective in reaching new customers in different geographic locations.
    a. Strongly disagree
    b. Disagree
    c. Neutral

d. Agree
e. Strongly agree

4. Government-backed initiatives aimed at promoting Bumiputera businesses can be helpful in expanding market reach.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
5. Accessing international markets brings additional challenges such as regulatory barriers and cultural differences.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
6. Expanding market reach through international trade can bring significant benefits to Bumiputera entrepreneurs such as increased revenue and exposure to new ideas and technological advances.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree

Section D: Financial Resources (Monfaredzadeh and Rezaei, 2020)

1. Access to alternative sources of funding, such as crowdfunding or angel investors, is important for Bumiputera entrepreneurs to achieve financial stability.
   a. Strongly Disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly Agree

2. The introduction of government-backed financial support schemes, such as grants, financial aid, or other facilities, can improve the financial status of Bumiputera entrepreneurs in the aluminium industry.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree
3. Access to financial support and investment can enable Bumiputera entrepreneurs in the aluminium industry to increase production, product quality, and expand market reach.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree
4. Financial literacy and management training programs can enable Bumiputera entrepreneurs in the aluminium industry to develop better financial acumen and improve their financial status.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree
5. Bumiputera entrepreneurs in the aluminium industry would benefit from the availability of networking and mentorship opportunities to receive guidance on accessing financial resources.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree

6. Government initiatives that promote and support financial inclusion can enable Bumiputera entrepreneurs in the aluminium industry to overcome challenges related to access to funding or capital.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree

Section E: Supplier Resources (Ab Rahman et al. 2021)

1. Technology helped Bumiputera entrepreneurs in the aluminium industry improve their supplier resource management.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
2. The availability and diversity of supplier options is a significant barrier for success in the aluminium industry for Bumiputera entrepreneurs.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
3. Technology is effectively been in streamlining supplier communication and coordination within the aluminium industry.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
4. Technology enabled access to wider supplier networks and increased supplier diversity for the aluminium industry.
    a. Strongly disagree

b. Disagree
c. Neutral
d. Agree
e. Strongly agree

5. Technology help in identifying and addressing supplier risks and potential disruptions within the aluminium industry.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
6. Further integration of technology assist Bumiputera entrepreneurs in the aluminium industry in their supplier resource management.
   7. Strongly disagree
   8. Disagree
   9. Neutral
   10. Agree
   11. Strongly agree

Section F: Economic Development (Uddin et al. 2021)

1. Technology has positively impacted the economic development of the aluminium industry.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree
2. Technology has contributed to the growth and expansion of Bumiputera-owned aluminium businesses.
   a. Strongly disagree
   b. Disagree
   c. Neutral
   d. Agree
   e. Strongly agree

3. Technology helped in creating new opportunities for Bumiputera entrepreneurs in the aluminium industry.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
4. Further integration of technology can support the economic development of Bumiputera entrepreneurs in the aluminium industry.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
5. Technology helped in creating a more competitive environment within and self-sufficient in the aluminium industry.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree
6. Technology have influence on the overall economic development of the Bumiputera community.
    a. Strongly disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly agree

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