THE IMPACTS OF INNOVATION ON GROWTH AMONG SMEs

SITI NUR LIDIYA BINTI AHMAD TARMIZI

BACHELOR OF TEHCNOPRENEURSHIP WITH HONOUR'S

(BTEC)

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

(UTeM)

2025

SUPERVISOR DECLARATION

I certify that this thesis entitled "THE IMPACTS OF INNOVATION ON GROWTH AMONG SMES", was prepared by SITI NUR LIDIYA BINTI AHMAD TARMIZI (B062110462) and has met the required standard for submission in fulfillment of the requirement for the award of Bachelor of Technology Entrepreneurship with Honours (BTEC) With Honours at Universiti Teknikal Malaysia Melaka.

Approved by,

Signature:

Supervisor's Name: PROFESOR DATUK DR. IZAIDIN BIN ABDUL MAJID

Date: 2/2/2025

Signature:

Panel's Name: TS. DR. YUSRI BIN ARSHAD

Date: 2/2/2025

THE IMPACTS OF INNOVATION ON GROWTH AMONG SMEs

A project report submitted in fulfillment of the requirement for the award of a Bachelor of Technology Entrepreneurship with Honours (BTEC) With Honours

Faculty of Technology Management and Technopreneurship (FPTT)

By

SITI NUR LIDIYA BINTI AHMAD TARMIZI

B062110462

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2025

STUDENT DECLARATION

Except for citations and quotations that have been properly acknowledged, I now declare that this thesis is based on my original work. I further declare that it has not been submitted for any degree or award at Universiti Teknikal Malaysia Melaka or any other institution earlier or concurrently.

Signature:

Name: SITI NUR LIDIYA BINTI AHMAD TARMIZI

Matric No: B062110462

Date: 2/2/2025

DEDICATION

Thanks to my supervisor, Profesor Datuk Dr. Izaidin Bin Abdul Majid, and panel, Ts. Dr. Yusri Bin Arshad guided me throughout this research. I want to thank my dear parents, Mr. Ahmad Tarmizi Bin Ahmad and Mrs. Faizah Binti Hamit, who have been my motivation source. Thank you for always supporting me when I was about to give up and remaining to provide me with moral backing and devotional, emotional, and financial support. All their teachings, advice, and spirit are deeply engraved in my heart. Finally, most profound thanks to my friends, especially Adriana, Hanani, Farhatul, and Auni, for their compassion, motivation, and constant support during the work I am continuing to complete. Without their blessing and motivation, this research would be impossible to accomplish in such a short period.

ACKNOWLEDGEMENT

I want to grab this opportunity to thank everyone for supporting, advising, and assisting me in completing my research project. First and foremost, I am thankful for my good health while conducting this research. Next, I would like to thank my lovely family and my husband for always being there for me. Furthermore, I thank my supervisor, Profesor Datuk Dr. Izaidin Bin Abdul Majid, for her guidance and advice while completing my final year project. During her supervision, the progress of this report was smooth, and I accomplished it within the time frame specified. Subsequently, I thank my panel, Ts. Dr Yusri Bin Arshad, for her advice throughout the research paper. Besides that, I would like to thank all previous researchers for their valuable contributions in delivering helpful theories and information as a reference source for my study. In addition, I would like to thank everyone who filled out my survey form and provided their thoughts on the progression of my research. Lastly, my heartfelt gratitude and appreciation go over to my relatives and those directly or indirectly engaged in completing this project, especially for their kindness, motivation, and continuous encouragement. Hopefully, this research and its findings will benefit future research resources.

ABSTRACT

The rapid evolution of technology and market dynamics necessitates that small and medium-sized enterprises (SMEs) continuously innovate to sustain competitive advantage and achieve growth. This study explores the multifaceted impacts of innovation on the growth trajectories of SMEs, focusing on various dimensions such as technology advancement, collaboration, access to capital, and customer feedback. Using a methods approach, the research uses quantitative analysis of growth metrics insights from SME leaders through surveys via Google Forms. The findings indicate that innovation significantly enhances growth prospects by increasing market share, improving operational efficiency, and fostering a culture of continuous improvement. However, the study also identifies key challenges SMEs face, including limited financial resources, resistance to change, and the need for skilled personnel. By highlighting the critical success factors and potential obstacles, this research provides practical recommendations for SMEs aiming to leverage innovation for sustainable growth. The insights gained underscore the importance of fostering an innovation-friendly ecosystem to support the long-term development of SMEs.

Keywords: Technology advancement, collaboration, and access to capital.

ABSTRAK

Evolusi pesat teknologi dan dinamik pasaran memerlukan perusahaan kecil dan sederhana (PKS) terus berinovasi untuk mengekalkan kelebihan daya saing dan mencapai pertumbuhan. Kajian ini meneroka kesan pelbagai bentuk inovasi ke atas trajektori pertumbuhan PKS, memfokuskan kepada pelbagai dimensi seperti kemajuan teknologi, kerjasama, akses kepada modal dan maklum balas pelanggan. Menggunakan pendekatan kaedah, penyelidikan menggunakan analisis kuantitatif cerapan metrik pertumbuhan daripada pemimpin PKS melalui tinjauan melalui Borang Google. Penemuan menunjukkan bahawa inovasi meningkatkan prospek pertumbuhan dengan ketara dengan meningkatkan bahagian pasaran, meningkatkan kecekapan operasi, dan memupuk budaya penambahbaikan berterusan. Walau bagaimanapun, kajian itu juga mengenal pasti cabaran utama yang dihadapi oleh PKS, termasuk sumber kewangan yang terhad, penentangan terhadap perubahan, dan keperluan untuk kakitangan mahir. Dengan mengetengahkan faktor kejayaan kritikal dan potensi halangan, penyelidikan ini menyediakan cadangan praktikal untuk PKS yang bertujuan untuk memanfaatkan inovasi untuk pertumbuhan yang mampan. Wawasan yang diperoleh menggariskan kepentingan untuk memupuk ekosistem mesra inovasi untuk menyokong pembangunan jangka panjang PKS.

Kata Kunci: Perkembangan teknologi, bekerjasama, dan pinjaman kewangan.

TABLE OF CONTENT

LIST OF ABBREVIATIONS	
Abbreviations	**Meaning**
IV	Independent Variable
DV	Dependent Variable
TA	Technology Advancement
C	Collaboration
ATC	Access to Capital
SPSS	Statistical Package for Social Science
AI	Artificial Intelligence
SME	Small Medium Enterprise
R&D	Research and Development
CRM	Customer Relationship Management

LIST OF APPENDICES		
APPENDICES		**PAGES**
A	Research Questionnaire	67-72
B	Gantt Chart PSM I	73
C	Gantt Chart PSM II	74

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides an overview of user research on how innovation affects SMEs' growth. The study's background, problem statement, research questions, objectives, definitions of important words, scope, importance, and summary are all included.

1.2 Research Background

This study aims to comprehend how innovation affects SMEs' growth. The foundation of many economies worldwide are small and medium-sized businesses (SMEs), which contribute to innovation, job creation, and economic diversification. SMEs must continuously innovate to survive and grow in a global market that is becoming more competitive and dynamic. This study aims to examine how innovation affects SMEs' growth and provide insight into the mechanisms via which innovative endeavors influence their performance and growth.

The ability to create, develop, manufacture, and scale new goods, services, processes, and business models for customers is known as business innovation. A significant amount of net new growth results from successful innovation. This study looks at how crucial innovation is to small businesses' performance in the contemporary business climate, citing Umang Mittal et al. (2023). Understanding the dynamics of innovation is essential for long-term growth and competitiveness, given the important role small enterprises play in economic development. Despite certain research findings, the study examines the several facets of innovation in small business management via a critical lens. According to Liviu Moldovan et al. (2024), innovation systems are complex, and their ability to adjust to societal and economic demands through business operations determines how well they work.

After that, the growth in the business is the process of gradually expanding and improving a company's performance. This may be accomplished through various methods, including growing revenue, entering new markets, and producing new goods or services. Artificial Intelligence (AI) technology is a key factor in reinventing the paradigms of development and innovation in enterprises in the modern era, characterized by fast technical breakthroughs and a global trend toward digitalization. This article explores how artificial

intelligence (AI) might spur economic growth and encourage creative business practices in emerging industries (Lucian Spulbar et al, 2024).

Empirical research has repeatedly revealed a beneficial relationship between innovation and SME growth. According to research, innovative SMEs expand faster, have a larger market share, and perform better financially than their non-innovative competitors. For example, (Roper and Love et al, 2002) discovered that SMEs that innovated their products and processes had much better sales and employment growth.

1.3 Problem Statement

Small and medium-sized enterprises (SMEs) play an important role in the global economy, promoting innovation, employment, and development. Despite their vital function, many SMEs struggle to achieve long-term growth. One of the key ways for SMEs to overcome these obstacles and prosper in a competitive market is via innovation. However, the particular impact of innovation on SME growth remains unclear and not much understood, particularly in terms of the processes, constraints, and guides of innovation in this context.

SMEs frequently encounter substantial challenges that restrict their growth. These include limited financial resources, insufficient infrastructure, regulatory restraints, and challenges in entering new markets. The research specifically looked at the financial management methods used by SMEs and their influence on their growth, as well as the issues that SMEs confront in terms of financial management practices (Ahmed Ibrahim Anyass et al, 2023). Furthermore, SMEs often operate with fewer resources than bigger corporations, making it more difficult to engage in R&D and other creative activities. As a result, many SMEs stay trapped in a cycle of restricted development, unable to scale their operations or extend their market presence successfully.

Innovation is widely recognized as a primary driver of economic development and competitive advantage. For SMEs, innovation may be a method to overcome resource constraints, access new markets, and fulfill changing client demands. Product innovation enables SMEs to create new or enhanced goods, process innovation increases operational efficiency, organizational innovation improves management practices, and marketing

innovation assists in reaching and attracting new consumers. Despite these potential benefits, there is little knowledge of how different forms of innovation affect SME growth.

Moreover, rapid technological change creates both possibilities and problems for SMEs. According to (Purnomo Budi Santoso et al, 2022), technology is critical to developing industrial values and excellence. It is critical to understand the primary factors behind deploying technical advancements that can help manufacturing firms attain competitive advantage and sustainability, particularly Small and Medium Enterprises (SMEs). While new technology can accelerate expansion, keeping up takes substantial investment and knowledge, which many SMEs lack. SMEs frequently face substantial expenses involved with adopting and integrating new technologies, and they may lack the necessary infrastructure and skills to apply them successfully. As a result, businesses risk missing out on efficiency savings and innovation possibilities, perhaps losing ground to competitors that embrace new technology more quickly.

1.4 Research Questions

Based on the problems listed in the problem statement, this study seeks to provide answers to the following queries:

a) What effect has the use of technological advancement had on SMEs' growth?

b) How can collaboration with other firms affect an SME's growth?

c) How does the access to capital affect our SME's capacity to capitalize on new market opportunities?

1.5 Research Objectives

Establishing a research purpose is crucial for conducting the study in a targeted and focused manner and preventing misunderstandings or misinterpretations of the results. The goals of the study are as follows:

a) To analyze the influence of technological innovation on the growth of SMEs, we will look at how the use of technological advances corresponds with SMEs' growth trends.

b) To explore the impact of collaboration with other businesses on SME growth by understanding the processes via which collaborative efforts contribute to the expansion and development of SMEs.

c) Investigate the relationship between access to capital and SME growth capacity by looking at how the availability of financial resources affects an SME's ability to capitalize on new market possibilities.

1.6 Definition of Key Terms

Explicit explanation of important terms or concepts in the study to ensure common understanding and avoid confusion among readers.

1.6.1 Innovation

According to Ata Taleghani (2022), innovation frameworks are strategic frameworks designed to enable organizations to access ideas, evaluate each one's pros and cons, make well-informed decisions, and create plans to turn ideas into business-generating opportunities. Business innovation is the ability to design, develop, produce, and scale new products, services, procedures, and business models for clients. Successful innovation generates a significant amount of net new growth.

1.6.2 Growth

The process of progressively growing and enhancing a business's performance is known as business growth. Increasing income, breaking into new markets, and creating new products or services are some ways to do this. This review study aims to investigate how business models are developed, how technology influences the development of new business models for

expansion, and how business models are developed in light of global phenomena like pandemics and climate change (Mohamad Zulkifli Abdul Rahim, 2024).

1.6.3 SMEs

"SMEs" refers to Small and Medium-sized Enterprises. These are enterprises that usually employ fewer people and generate less money than larger firms. The specific definition of a small and medium-sized enterprise (SME) varies by country and industry, although they often fall under particular size limits for employment and revenue. In this article, we will look at the features, relevance, problems, and contributions of SMEs to the economy.

SMEs are frequently regarded as the backbone of global economies due to their significant contributions to employment, innovation, and economic growth. Small and medium-sized enterprises (SMEs) differ from giant businesses because they are smaller, more flexible, and can adjust to changing market conditions. They include a wide spectrum of firms from many industries, including retail, manufacturing, services, and technology startups.

1.7 Significance of the Study

The study fills a gap in examining the impact of innovation on growth among SMEs. Certainly, boosting innovation and attaining long-term success is a road fraught with obstacles for SMEs. However, the research of (Sohail Amjad, 2024), discusses challenges and opportunities associated with legal frameworks in promoting sustainable business innovations and provides recommendations for policymakers and businesses to enhance their collaborative efforts toward achieving sustainable development goals. For example, financial constraints which is limited capital. Startups and SMEs frequently lack the funds to invest in R&D, marketing, and infrastructure. This constraint reduces their capacity to develop and compete effectively in the market.

The study will guide the SME owners. This is because SME owners have the opportunity to benefit from the study's insights by gaining a deeper understanding of the legal challenges and opportunities related to innovation and sustainable business practices. They can use this knowledge to navigate regulatory hurdles, develop compliance strategies, and leverage the legal framework to drive innovation and long-term success. Even the SMEs can also provide opportunities for consumers to buy and use products or services provided by them.

Apart from that, users will also be able to make purchases perfectly. Therefore, SMEs can reach their targets in the market and can even make a decent profit.

1.8 Scope of Research

This study aims to analyze the influence of technological innovation on the growth of SMEs, we will look at how the use of technological advances corresponds with SMEs' growth trends. The research will focus on exploring the impact of collaboration with other businesses on SME growth by understanding the processes via which collaborative efforts contribute to the expansion and development of SMEs. After that, the research also focuses on investigating the link between access to capital and SME growth capacity by looking at how the availability of financial resources affects an SME's ability to capitalize on new market possibilities and find the most important forms of customer feedback for defining SME growth strategies, investigate the particular feedback mechanisms that have the most influence on molding SMEs' strategic direction and development. Data was collected from a questionnaire distributed to SMEs using a Google form survey. The target respondents are SMEs, and 100 respondents were targeted to answer this questionnaire.

1.9 Summary

The first chapter provides background information, the problem statement, the objectives, and the significance of the research topic. It also defines key terms and describes the importance and scope of the study. The following chapter covers important research facts and factors related to the study, laying the foundation for a thorough examination of how innovation affects SMEs' growth.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses current thoughts, benefits, and discoveries from professionals in the field of research. It creates a conceptual framework by combining existing and relevant factors and thoroughly evaluates their relevance to this research.

2.2 SMEs

Businesses classified as small and medium-sized (SMEs) are those whose assets, revenues, or workforces are below a specific threshold. Every nation defines a small and medium-sized business differently. In addition to meeting certain size requirements, the industry the company operates in may also be taken into account. Small and medium-sized businesses, or SMEs, are essential to Bangladesh's economy and have been identified as a major driver of economic expansion and initiatives aimed at reducing poverty. As a result, a thorough grasp of the idea of SMEs and how they contribute to economic development and growth is crucial (Md. Shah Azam, 2023). Small and medium-sized businesses, or SMEs, are important to the economy. They employ vast numbers of people, outnumber large firms, and are usually ambitious, which influences innovation. Although they may be found in almost every industry, small and medium-sized enterprises are more prevalent in sectors that need fewer workers and lower initial investment levels. Typical SMEs include dentistry clinics, taverns, restaurants, and law firms.

2.3 Innovation

According to Ata Taleghani (2022), innovation frameworks are strategic frameworks designed to enable organizations to access ideas, evaluate each one's pros and cons, make well-informed decisions, and create plans to turn ideas into business-generating opportunities. Business innovation is the ability to design, develop, produce, and scale new products, services, procedures, and business models for clients. Successful innovation generates a significant amount of net new growth. There are innovation impacts that influence the development of

growth among entrepreneurs and SMEs such as technology advancement, collaboration, access to capital, and customer feedback.

a) Technology advancement

Technology advancement is the progressive development and use of new technologies to enhance processes, goods, and services. It entails the adoption, integration, and invention of technical tools and processes that drive efficiency, productivity, and growth in diverse sectors. According to (Hussain Bux Marri, Zahir Irani, and Angappa Gunasekaran et al, 2007) has shown, Advanced Technology contributes significantly to the enhancement of quality and flexibility in Small and Medium Enterprises (SMEs).

b) Collaboration

Collaboration is the act of working together with others, whether they be individuals, organizations, or institutions, to achieve common objectives. Collaboration in business, particularly among entrepreneurs and SMEs, may promote innovation, improve capacities, and broaden market reach.

c) Access to capital

Access to capital refers to small and medium-sized enterprises' capacity to get the financial resources required to establish, sustain, and expand their firms. This cash can come from a variety of sources and is required to support operations, invest in innovation, increase market reach, and scale the company.

2.4 Growth

The growth in the business is the process of gradually expanding and improving a company's performance. This may be accomplished in a variety of methods, including growing revenue, entering new markets, and producing new goods or services. The goal of this review study is to explore the methods of business model innovation, the impact of technology on the creation of novel models for business growth, and the development of business models in the context of global phenomena such as pandemics and climate change, (Mohamad Zulkifli Abdul Rahim, 2024).

Growth in the context of entrepreneurship and Small and Medium Enterprises (SMEs) takes several forms, including financial expansion, market reach, innovative capacity, and organizational development. Understanding and promoting growth among entrepreneurs and

SMEs is critical for economic development, job creation, and societal advancement. Other than that, growth allows SMEs to spend on R&D, resulting in innovative goods and services. This innovation boosts market competitiveness, encouraging larger enterprises to improve and advance industry standards.

2.5 The Relationship Between Innovation and Growth

Innovation is an essential component of development, generating growth and altering the journey of organizations across industries. It signifies the quest for new ideas, the embodiment of creativity, and the driving force behind dramatic change. In this article, we will look at the fundamental link between innovation and growth, specifically how innovation may launch organizations to new heights of success. Innovation is a significant growth driver, enabling organizations to broaden their horizons, enter new markets, and differentiate themselves from rivals. Organizations may captivate customers' imaginations, take market share, and position themselves as industry leaders by introducing innovative goods, services, or processes.

The creation of innovative products allows businesses to satisfy changing consumer needs, increase customer happiness, and fetch higher pricing. The studies show that motivated consumer innovativeness in the creation and distribution of innovative products is considered. The process of determining consumer preferences for innovative products based on their attributes is investigated, (Tetiana Reshetilova et al., 2021)

Furthermore, innovation improves productivity and efficiency, resulting in cost savings and increased profit margins. Businesses may increase production with the same or fewer inputs by simplifying processes, using new technology, and optimizing resource utilization. This enhanced efficiency not only increases profitability but also allows businesses to reinvest savings in more innovative efforts, resulting in a virtuous cycle of growth. Both research and prior experience reveal that the prime driver for companies to innovate is the ability to profit from product or process improvement, with companies needing to increase their investment in research and development to improve productivity and reduce costs (Christopher D. H. Wilson et al, 2005).

Innovation and growth also interact in the context of entrepreneurship and small and medium-sized businesses (SMEs). Entrepreneurs and SMEs frequently rely on innovation to

establish a market presence and achieve quick development. Innovative businesses may disrupt existing sectors by providing unique solutions that pique investor and customer interest. As these businesses expand, they contribute to job creation, economic dynamism, and more competition, which supports additional innovation and growth. This entrepreneurial environment fosters an ongoing cycle of invention and growth, propelling economic development and societal advancement.

2.6 The Impact of Innovation Influencing Growth Among SMEs

Small and medium-sized firms (SMEs) rely heavily on innovation to drive development. It comprises a variety of elements that work together to generate corporate growth, competitive advantage, and market expansion. Understanding all of these factors may help firms harness innovation more effectively, putting them on track for long-term success.

The rapid pace of technology development presents SMEs and organizations with several chances to innovate. In the current era, which is marked by rapid technological advancements and a global shift toward digitalization, artificial intelligence (AI) technology is a key factor in redefining the paradigms of growth and innovation within businesses, according to the research (Marius-Daniel Mitrache et al, 2024). Innovative technologies like blockchain, AI, machine learning, and the Internet of Things (IoT) may help organizations increase productivity, streamline processes, and produce new products. R&D expenditure is crucial for innovation. By enhancing current offerings and creating novel items via research and development, businesses may maintain a competitive edge in their industries.

After that, collaboration is a key driver of innovation. Collaboration with other enterprises, research institutes, and industry groups can result in pooled knowledge and resources, leading to new solutions (Guilong Zhu et al, 2021). Open innovation techniques, which involve sourcing ideas and solutions from external partners and communities, have the potential to speed the innovation process. These coordinated efforts frequently result in breakthroughs that individual entities would struggle to achieve on their own.

Furthermore, access to capital is critical for innovation. SMEs require financial resources to support creative ventures, whether through venture capital, angel investors, or crowdfunding platforms. Effective finance management is also essential for ensuring that innovation initiatives are sustainable and scalable. Other research confirms also that SMEs are

still in a worse position compared to large enterprises in the area of access to different sources of capital (Marian Holienka et al, 2017). Businesses that properly allocate and utilize financial resources can pursue ambitious innovation agendas without jeopardizing financial stability.

In conclusion, innovation is diverse and requires a combination of technology advancement, availability to financing, collaboration, and customer feedback factors. SMEs who strategically exploit these characteristics may create considerable growth, sustain competitive advantages, and achieve long-term success. These businesses can handle hurdles and capitalize on opportunities in their particular industries by cultivating an innovative culture and being responsive to the changing business landscape.

2.7 Conceptual Framework

A conceptual framework offers an organized strategy for comprehending and analyzing a certain occurrence. A conceptual framework aids in the identification and organization of the major elements and their interactions that impact the factors of innovation influencing growth among entrepreneurs and SMEs.

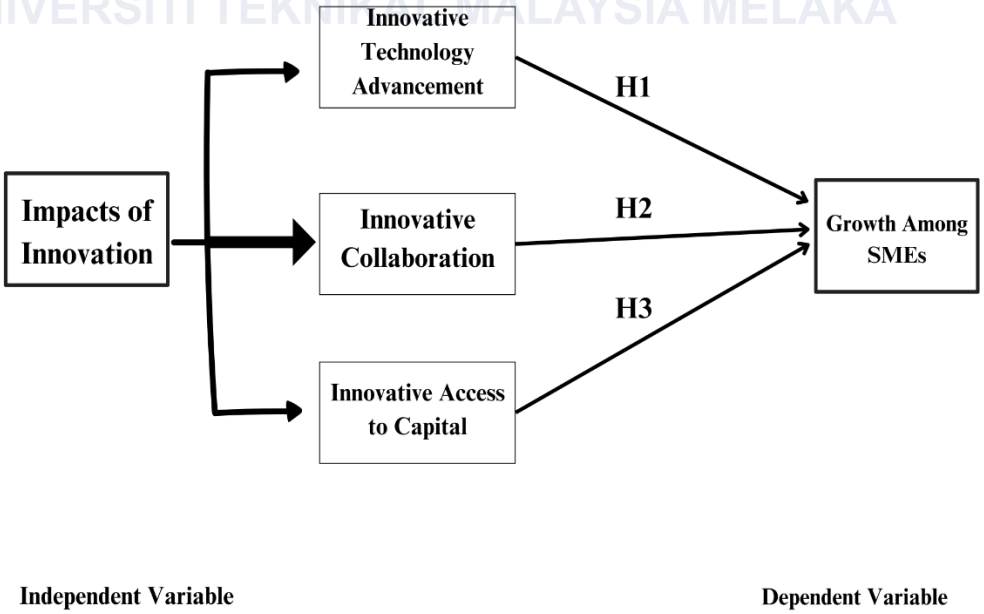


Figure 2.1: The Impacts of Innovation Influencing Growth Among SMEs

2.7.1 Innovative Technology Advancement and Business Growth

Innovative technology has emerged as a critical engine of business growth in the current economic landscape. As technology advances, firms that embrace and incorporate these improvements may gain significant competitive advantages, improve operational efficiencies, and find new market possibilities. According to (Zhao Wang et al, 2019) technological advancement is a dynamic and complicated process, and effective technical upgrades may improve an organization's overall competitiveness. Even though there has been numerous and dynamic firm-level research on technological upgrading, an integrated framework is still required to comprehensively cover the whole process of a firm's transition from a technological new entrant to an innovation.

H1: The adoption of innovative technology creates new market prospects for organizations.

2.7.2 Innovative Collaboration and Business Growth

In today's linked and dynamic business environment, collaboration has emerged as an important engine of innovation and progress. Innovative collaboration is defined as strategic alliances and cooperative efforts between firms, organizations, or individuals to create innovative goods, services, or processes. Collaboration among business entities is an important component of business strategy and tactics because the synergistic effects produced by this phenomenon can manifest themselves in increased growth, the development of innovation, the reduction of operational risks, and other areas (Larysa Krysyuk et al, 2023).

H2: Innovative collaboration leads to greater market expansion for firms.

2.7.3 Innovative Access to Capital and Business Growth

In today's business landscape, access to capital is a critical determinant of a firm's ability to grow and innovate. Traditional methods of raising capital, such as bank loans and equity financing, are being supplemented, and sometimes supplanted, by innovative financing mechanisms. These new ways of accessing capital are transforming the way businesses fund their operations, drive expansion, and achieve long-term success. These innovative finance models provide not just the financial resources required for expansion, but also strategic assistance, market validation, and increased adaptability. As firms develop an increasingly complicated and competitive landscape, creative access to financing will remain a critical predictor of success and sustainable growth.

H3: Access to financing boosts the business growth potential for SMEs.

2.8 Summary

From the literature review how the impacts of innovation affect growth among small and medium-sized businesses (SMEs). Understanding these impacts can help SMEs modify their strategies for technology advancement, collaboration, access to capital, and customer feedback. The research emphasizes the significance of the impacts influencing growth among SMEs. Leveraging these data may help small and medium-sized businesses improve their market positioning, product development, customer connections, and overall growth.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Research methods are the processes and procedures that researchers use to acquire and analyze data for a study; these procedures are the actual processes used to solve a research issue, resulting in a systematic and ordered approach to evidence collecting and knowledge development. The methods used in this study are determined by the study objectives, the type of data required, and the resources available. The previous chapter examined the effects of innovation on growth among SMEs. Researchers frequently use a variety of strategies to obtain data and efficiently answer their research topics. This study employed quantitative research methodologies, which entailed the systematic collection and analysis of numerical data to answer research objectives. Quantitative research aims to measure and quantify factors, allowing researchers to draw statistical conclusions and generalize findings to wider populations. This method is particularly appropriate for systematically investigating the impacts of innovation influencing growth among SMEs.

3. 2 Methodological choice

According to Saunders et al. (2016), there are three types of methodological choices: quantitative, qualitative, or mixed methods, defined by whether they concentrate on the data of words, numbers, or both.

The research approach is a framework that describes how research is conducted. It covers methods and procedures for conducting specific studies or research. An analytical approach is a group of methods implemented in various forms of research (Walliman, 2015). Therefore, it is necessary to choose an approach that is appreciated for the study. The quantitative research approach was used in this study because it allowed the researcher to better understand the respondents' opinions and perspectives by conducting a questionnaire with a survey using Google Forms. It is a thorough research strategy since it enables researchers to find information and knowledge by becoming involved in current events (Creswell, 2003; Williams, 2007).

After the research problems and focus to conduct research are refined and determined, the researcher will conduct research studies at the University Teknikal Malaysia Melaka. The

researcher has chosen a quantitative method in which the researcher will provide some questions related to the factors of innovation on growth among SMEs.

3.3 Research Design

The word "research design" refers to the broad plan or strategy that guides the full research process, from question generation to data processing and interpretation. It provides a framework for researchers to plan their investigations, make educated judgments about the methodologies and procedures to employ, and assure the validity and dependability of their findings. A well-designed research project is necessary for obtaining trustworthy and relevant results.

The methodological choice is the researcher drawing accurate conclusions and responding to pertinent research issues, research approaches and methods applied (Wahyuni, 2012). Researchers choose research methods based on the research design, data collection techniques, measurement scales, sampling techniques, reliability and validity testing procedures, data analysis procedures, and the practical and theoretical forms of significance connected to the research (Romero S, 2002).

This research used quantitative research methods to investigate the impacts of innovation influencing growth among SMEs. The collection of data and information has been used to prove the impacts of innovation influencing growth among SMEs by innovating and improving existing and new products. The impacts of innovation can help SMEs grow their business.

3.4 Data Sources

The location where the data was obtained is known as the data source. The two categories of information and data that needed to be gathered were primary and secondary sources. Here, study data is gathered and arranged based on numbers, statistics, and observations. The researcher used both data sources to carry out this investigation.

3.4.1 Primary Data

The term "primary data" refers to information that was gathered by an investigator specifically for the study's stated purpose; it is first-hand information and the primary sources of the data collected; primary data collection methods included surveys, interviews, and experiments; and primary data are essential to this investigation.

Furthermore, the study needed secondary data sources. Books, journals, notes, and related articles are the sources of secondary data. Respondents were given questionnaires to complete to gather primary data. Both in-person interviews and online surveys are used to disseminate the data. According to Saunders et al. (2019), the Internet is a key data source, which presents unique ethical standards issues and conundrums. According to Saunders et al. (2019), potential responders must be allowed to make an educated decision about participating to guarantee that primary data collection is carried out ethically. Furthermore, original data shouldn't be altered, created, or results falsified.

The primary data for this study comes from the respondents who completed this questionnaire. The questionnaire respondents are predominantly small and medium-sized businesses (SMEs). Data collected from these respondents can be used to create a thorough report. The results of this research will be useful for others to utilize as a reference.

3.4.2 Secondary Data

According to Saunders et al. (2019), secondary data consists of raw data as well as published summary reports. Over the last decade, the number of possible secondary data sources has grown rapidly, as has their ease of access. Secondary survey data are existing data that were acquired for another reason using a survey method, usually questionnaires. Secondary data refers to previously collected information available to researchers. Secondary data may refer to data utilized in prior literature. The secondary data was required to supplement the original data to achieve the study's aim.

Additionally, document secondary data is defined as information that, in contrast to spoken words, may be digitally and physically kept as evidence, enabling data to be transferred across time and place and reanalyzed for different reasons. They therefore include text, audio, and video information. According to Saunders et al. (2019), while books, papers, journals, and reports are commonly used to store secondary data, the text itself may also provide important

raw data. Most researchers may obtain a wealth of information and develop expertise by utilizing secondary data sources.

The secondary research data on innovation and growth among SMEs was obtained from Google Scholar and Research Gate to support the research purpose. These are existing data that have been published and will be used as references. This secondary data is utilized to validate and corroborate the preceding scholar's study and results. Furthermore, when technology advances, past studies may help and better understand the innovation that influences development among SMEs.

3.5 Research Strategy

The research strategy in this study is a thorough plan or technique adopted by the researcher to meet certain research questions or objectives. It describes the stages and methods to be followed in data collection, analysis, and interpretation, with the ultimate goal of generating new information or insights. In this study, a survey was used to gather primary data for statistical analysis.

Research strategies are defined widely by Saunders et al. (2019) to achieve the desired outcome. A research strategy is a plan for how a researcher would approach their research problem, according to Denzin et al. (2018). The research strategy directs investigators as they design, carry out, and oversee their investigations. It is also the methodological connection between your ideology and the techniques you employ for data collection and analysis. The goal of research processes is to match data collecting and evaluation with the researcher's philosophy.

Experiment, survey, archival and documentary research, and case study are some of the methodologies identified by Saunders et al. (2019), while ethnography, narrative inquiry, action research, and grounded theory are also research methods. According to Saunders, this study combined survey results, theory, and other research to undertake thorough research on the elements of innovation that influence growth among SMEs. The approach to be employed is to conduct surveys and analyze the results using computer tools. Previous research findings were analyzed to inform the current study.

3.5.1 Survey Strategy

Surveys are usually utilized in conjunction with a deductive research approach (Saunders et al., 2019). The researcher has chosen to use a survey in order to gather information related to the study subject. Additionally, the public views the survey method as reliable and simple to understand. Because it quickly gathers community data and makes it easy for researchers to compare replies, questionnaire-based surveys are widely employed. Additionally, descriptive and inferential statistics may be used to statistically evaluate data collection.

3.5.2 Pilot Test

Saunders et al. (2019) discuss pilot testing to assist respondents by enhancing the questionnaire such that there are no difficulties in answering the questionnaire and no hurdles later in documenting the results. Because the scope of this research is limited to the factors of innovation influencing growth among SMEs and time resources are limited, pilot testing would be limited to a small number of respondents who could at least have an impact on the population's significant variances, resulting in a change in responses.

For the pilot test, a total of 35 respondents who have experience in innovating products are required to answer the survey questionnaire, so that the questionnaire can be improved for further data collection. The researcher used SPSS version 29.0 software to identify the reliability of the survey from the collected data. Table 3.0 below shows the descriptive statistics of the pilot test.

3.5.2.1 Descriptive Statistics (pilot test)

The data center's location can be inferred from the mean, which is a representative value (Table 3.0). The mean and standard deviation work together to describe a data set comprehensively; a higher standard deviation indicates greater variability, while a lower standard deviation indicates that the data points are closer to the mean.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
TA	35	2.00	4.00	6.00	4.9257	.75160
C	35	2.00	4.00	6.00	4.9429	.63166
ATC	35	1.80	4.00	5.80	4.8571	.57919
DV	35	2.00	4.00	6.00	4.9029	.68147
Valid N (listwise)	35					

Table 3.0: Item Statistics for Pilot Test

Thus, all data for 35 respondents was valid. The mean for all variables is above 6 which mean between agree and strongly agree. From this result, the researcher decided to proceed to collect a respondent.

3.5.2.2 Reliability Test (Cronbach's Alpha)

The results of a pilot test with 35 respondents are displayed in Table 3.1's reliability test. Chapter 2's theoretical framework reveals that three variables technology progress, collaboration, access to finance, and SMEs' growth are engaged in this research of the survey questions.

Variables	Cronbach's Alpha	N of Item	Result
TA	0.847	5	Good
C	0.759	5	Acceptable
ATC	0.731	5	Acceptable
DV	0.717	5	Acceptable

Table 3.1: Interpretation of Reliability Based on Cronbach's Alpha for Pilot Test Result

Based on Table 4.1, Cronbach's Alpha for the variable technology advancement (TA) is 0.783, collaboration (C) is 0.905, access to capital (ATC) is 0.886, and growth among SMEs (DV) is 0.875. It shows that all variables have good and acceptable consistency. Thus, all the questions can be used to find the other 201 respondents.

3.5.2.3 Validity Test

Correlation testing in the context of pilot testing involves examining the strength and direction of the relationship between two or more variables. These tests help researchers understand the extent to which changes in one variable are associated with changes in other variables.

Correlations

		TA	C	ATC	DV
TA	Pearson Correlation	1	.715**	.713**	.791**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	35	35	35	35
C	Pearson Correlation	.715**	1	.696**	.585**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	35	35	35	35
ATC	Pearson Correlation	.713**	.696**	1	.625**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	35	35	35	35
DV	Pearson Correlation	.791**	.585**	.625**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	35	35	35	35
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 3.2: Analysis of Pearson Correlation

Table 3.2 shows the Pearson correlation analysis for all independent variables with dependent variables. Thus, table 3.3 displays the interpretation of validity based on Pearson correlation for pilot test results.

Independent Variable	Pearson Correlation	Result
Technology Advancement	0.791	Strongly positive
Collaboration	0.585	Strongly positive
Access to Capital	0.625	Strongly positive

Table 3.3: Interpretation of Validity Based on Pearson Correlation for Pilot Test Result

Thus, all of the variables are valid and can be used as variables for the questionnaire. The researcher can proceed to collect other 201 respondents.

3.6 Location of Research

This research was conducted at Melaka among SMEs, to understand the factors of innovation influencing growth among SMEs in this specific geographic location. Melaka were used as the location for this research because this research needs to find out the unique characteristics, preferences, and behaviors of the impacts of innovation influencing growth among SMEs.

3.7 Population

Weeks, J. R. (2020) defines a population as a nation or a group of people who share a characteristic. The population must be identified to gain knowledge from the target group and validate the conclusions drawn from the target group. Additionally, the population not only provides knowledge but also demonstrates how to apply it.

The population must be identified to determine the determinants of innovation that influence growth among SMEs. The population for this study is SMEs.

This study's population of interest consists of small and medium-sized enterprises. Data for this study were collected using a probability random sample survey method in Melaka, respectively. An online questionnaire was employed to collect responses more efficiently.

3.8 Sampling Design

A mathematical procedure known as sampling design establishes the likelihood that a certain sample will be selected. By concentrating on a subset of situations or elements rather than all potential conditions or elements, sampling approaches enable the collection of less data (Saunders et al., 2019). Additionally, certain research topics might need sample data that enables the researcher to draw statistical conclusions about every instance from which your sample was drawn. Additionally, when it is not practicable for researchers to survey the whole population or when time restrictions prevent it, sampling might be a good substitute for a census. Sampling methods may be divided into two groups, according to Saunders et al. (2019): non-probability sampling and probability or representative sampling. For this inquiry, simple random selection is the best choice. This was selected since it is simple to determine the potential of the sample.

Sample Size Formula

$$\mathbf{n = \frac{N(Z^2)\ p\ (1\text{-}P)}{(N\text{-}1)\ E^2 + Z^2(1\text{-}P)}}$$

- n = required sample size
- N = population size (45,000 SMEs in this case)
- Z = Z-value (the number of standard deviations from the mean corresponding to the desired confidence level, e.g, $1.96^2 = 3.841$ for 95% confidence)
- p = estimated proportion of an attribute that is present in the population (0.5) is typically used if the proportion is unknown, as it provides the maximum sample size.
- E = margin of error (0.07 for = 5%)

$$n = \frac{45{,}000\ (1.96^2)\ 0.5\ (1\text{-}0.5)}{(45{,}000\text{-}1)\ 0.05^2 + 1.96^2\ (1\text{-}0.5)}$$

$$n = \frac{126772\ (0.5)\ (0.5)}{32999(0.0025) + (3.8416)\ (0.5)\ (0.5)}$$

$$n = \frac{31693}{83.4579}$$

$$n = 379$$

The population of SMEs in Melaka was only 45,000 people who have the business. To achieve a 95% confidence level that the true value is within ±5% of the surveyed value, the sample size calculation is 379 indicating that more surveys are required. This research, however, is aimed at small and medium-sized businesses. Research aimed at the most qualified respondents to guarantee that the data focused on the innovative aspects that drive growth among SMEs. As a result, just 200 respondents were chosen to ensure more targeted data collecting.

3.9 Questionnaire Development

The survey questionnaire for this analysis is based on the impacts of innovation influencing growth among SMEs. To modify for the current study, each variable's elements were slightly adjusted. To indicate the declaration of agreement, all assessment items were tested using a six-point Likert scale (1 = strongly disagree, 6 = agree). The questionnaire's items were all prepared in English.

The first component of the questionnaire section A was intended to examine the demographics of the respondents. The demographic features of the respondents were addressed with closed-ended multiple-choice questions. Demographic questions are used to determine which respondents completed the questionnaire and what sort of company they run. SMEs should fill out the surveys since they operate their businesses and are familiar with the challenges they confront.

Next, in the second part sections B1, B2, and B3 the researcher has focused on the impacts of innovation on growth among SMEs. This is to help SMEs improve their business in terms of products, quality, and so on.

After that, in section C, the researcher focuses on the growth among SMEs, and how can they be classified. Furthermore, researchers can also help SMEs identify factors that affect their business growth. Therefore, SMEs can increase their sales volume better.

When rating questions ask respondents how strongly they agree or disagree with a proposition, Likert-style ratings are most frequently used (Saunders et al., 2019). This quiz used a six-point Likert scale, where 1 meant "strongly disagree," 2 meant "fairly disagree," 3 meant "disagree," 4 meant "strongly agree," 5 meant "fairly agree," and 6 meant "agree."

Table 3.4: Questionnaire Design

Section	Content
A	**Respondent Profile/Background** • Age • Gender • Industry Sector • Number of employees • Year in operation
B1 **B2** **B3**	**Assessment of Independent Variables** • What effect has the use of technological advancement had on SMEs' growth? • How can collaboration with other firms affect an SME's growth? • How does the access to capital affect our SME's capacity to capitalize on new market opportunities?
C	**Assessment of Dependent Variable** • Growth among SMEs

Table 3.5: Likert Scale Survey

Strongly Disagree	Fairly Disagree	Disagree	Strongly Agree	Fairly Agree	Agree
1	2	3	4	5	6

Table 3.6: Variables for Questionnaire

Item Code	Questions Section	References
(B1) TA1	Technological advancements have significantly increased our efficiency and productivity.	Michael Harnisch et al. (2015), Dongsuk Kang, Duk Hee Lee et al. (2016)
TA2	Using digital marketing tools has improved our customer reach and engagement.	U. Prasanna Kumar & R. Arthi et al. (2023), Tochukwu Ignatius Ijomah et al. (2024)
TA3	Advanced technologies have enabled us to innovate and develop new products more effectively.	Ron Sanchez et al. (1996)
TA4	Data analytics tools have enhanced our decision-making processes.	Maryam Ghasemaghaei et al. (2019), Oluwatosin Abdul-Azeez et al. (2024)
TA5	Technology has helped us achieve significant cost savings in our operations.	Özlem Ergun, Luyi Gui, and Julie Swann et al. (2014)

(B2) C1	Collaborations have provided us access to new markets.	David C. Mowery et al. (1989), Okwe Daniel Obeka et al. (2024)
C2	Partnering with other firms has allowed us to share resources and reduce costs.	Peter Baloh, Sanjeev Jha, Yukika Awazu et al. (2008)
C3	Joint ventures have helped us mitigate risks associated with new projects.	Jeffrey Pfeffer and Phillip Nowak et al. (1976)
C4	Collaborations have enhanced our ability to innovate.	Claudine A. Soosay, Paul W. Hyland, Mario Ferrer, et al. (2008)
C5	Strategic partnerships have improved the efficiency of our supply chain.	Charles J. Corbett, Joseph D. Blackburn, et al. (1999)
(B3) ATC1	Having sufficient capital has allowed us to expand our operations.	Timothy Bates and Alicia Robb, et al. (2013)
ATC2	Access to funding has enabled us to enter new markets.	Gina Colarelli O'Connor, Mark P. Rice, et al. (2012)
ATC3	We have been able to invest in new technologies due to accessible capital.	Carol Corrado, Charles Hulten and Daniel Sichel, et al. (2005)
ATC4	The availability of capital has facilitated our ability to innovate.	Zaid Jaradat, Ahmad Mtair Al-Hawamleh, et al. (2024)

ATC5	With adequate capital, we can take advantage of emerging opportunities more effectively.	Candida G. Brush, Patricia G. Greene, and Myra M. Hart, et al. (2001)

DV	**Questions Section**	**References**
1	We have successfully reduced operational costs while increasing profits.	Santi Prameswari and Sri Trisnaningsih, et al. (2024)
2	We regularly explore opportunities for international expansion.	Dr D Renukadevi, et al. (2024), Sirui Li, et al. (2024), Yadong Luo & Rosalie L Tung, et al. (2007)
3	Innovation is a core part of our business strategy.	David J. Teece, et al. (2010), Rajan Varadarajan et al. (2018)
4	We have a strong focus on employee development and training.	Nicholas Clarke, Malcolm Higgs, et al. (2014)
5	Market competition poses a major challenge to our growth.	Jeremy F. Dent, et al. (1996), C.Samuel Craig & Susan P. Douglas, et al. (1996)

3.10 Construct of Measurement

In survey research, a construct refers to an abstract concept, topic, or subject matter that may be evaluated through questions. Aside from that, the interactions between abstract structures incorporate theoretical claims. To estimate the strength of correlations, constructs must be tested accurately and objectively. The table below shows the construct of measurements for the independent and dependent variables.

Table 3.7: Construct of Measurement

SECTION	CONSTRUCT	COMMENTS	OPERATIONAL MEASURE	QUESTIONNAIRE/LOCATION IN THE QUESTIONNAIRE
A	Respondent Profile/Background	To examine the demographics of the respondents	• Age	• 18 – 20 • 21 – 25 • 26 – 30 • 31 – 35 • 36 and above
			• Gender	• Male • Female
			• Industry sector	• Retail • Healthcare • Service
			• Number of employees	• 0 - 5 • 6 – 10

				• 11 and above
			• Year in operation	• 0 month – 5 month • 6 month – 1 year • 2 year – 5 year • 6 year – 10 year • 11 years and above
B1	Assessment of independent variable	Impact of innovation	• Technology Advancement: Likert scale (1 = Strongly disagree, 6 = Agree)	• Section B1 • Question 1 – Question 5
B2			• Collaboration: Likert scale (1 = Strongly disagree, 6 = Agree)	• Section B2 • Question 1 – Question 5
B3			• Access to capital: Likert scale (1 = Strongly disagree, 6 = Agree)	• Section B3 • Question 1 – Question 5
C	Assessment of dependent variable	Growth among SMEs	• Growth among SMEs: Likert	• Section C • Question 1 – Question 5

			scale (1 = Strongly disagree, 6 = Agree)	

3.11 Data Analysis

The process of cleansing, modifying, and modeling data to extract information that may be used to make business choices is known as data analysis. Finding valuable information in data and using it to guide decisions is the aim of data analysis. The data analysis technique enables you to do previously unplanned investigations in response to novel findings, claim Saunders et al. (2019). Consequently, it codifies the standard practice of searching for new associations in data that your study was not intended to explore.

Moreover, computers make this quick and easy. Data from a survey on the aspects of innovation influencing SMEs' growth was analyzed using the Statistical Package for Social Science (SPSS) software. Additionally, this application can effectively handle massive amounts of data, which makes the evaluation process of data collecting and tabulation for quantitative research easier.

Additionally, multiple regression analysis was used to look at the relationship between the independent and dependent variables. The external drivers of innovation and the connection between innovation and growth were investigated in this study using multiple regression analysis.

The external determinants of innovation that impact SME growth rates were then investigated using the Pearson Correlation Coefficient, which Saunders et al. (2019) defined as the degree of a linear link between two ranking or numerical variables.

3.11.1 Statistical Package for the Social Sciences (SPSS)

Following data collection, the researcher used the Statistical Package for Social Sciences (SPSS) software version 29.0, which is a computer program that allows researchers to perform complex statistical analyses on collected data to answer research objectives. Based on the assumptions of the study, SPSS would also be used to scale the connection of the proposed model. SPSS is a program that organizes complex data into large pie charts or graphs and finds answers to questionnaires.

The SPSS program was used to conduct a statistical analysis of the survey data on the elements of innovation that influence growth among SMEs in Melaka. Pie charts and graphical representations were created to help organize the data gathered.

3.11.2 Multiple Regression Analysis

An equation connecting the independent variable (X) and the dependent variable (Y) is the result of the regression analysis; it contains a regression coefficient and an additive constant. The general framework of the multiple regression models used in this study is shown in the equation below. Multiple regression analysis follows correlation and was used when the researcher wanted to forecast the value of one variable depending on another. The dependent variable, also known as the outcome variable, is the variable that the researcher aimed to predict.

$$\mathbf{Y = b0 + b1X1 + b2X2 + b3X3}$$

Where,

Y = Growth among SMEs

b0 = Regression Constant

X1 = Technology advancement

X2 = Collaboration

X3 = Access to capital

b1, b2, b3 = Regression Coefficient

3.11.3 Pearson's Correlation Coefficient

The substantial association between the dependent and dependent variables was examined in respondent data analysis using Pearson's correlation coefficient. Saunders et al. (2019) define a correlation coefficient as the strength of a linear relationship between two numerical or ranking variables. The sample correlation coefficient, or r, is used to calculate population correlation. The goal of this study is to identify a favorable correlation.

The correlation value, r, ranges from +1 to -1, with +1 denoting a perfect positive link, according to Saunders et al. (2019). This implies that there is a close relationship between the variables and that as one increases, the other climbs as well. A connection that is entirely negative is indicated by a score of -1.

Table 3.8: Pearson's Correlation Coefficient Scale

Coefficient Range	Strength
$0.8 \leq r \leq 1.0$	Perfect Positive Correlation
$0.6 \leq r \leq 0.79$	Positive Correlation
$0.4 \leq r \leq 0.59$	Moderate Correlation
$0.2 \leq r \leq 0.39$	Negative Correlation
$0 < r \leq 0.19$	Perfect Negative Correlation

3.12 Time Horizon

A time horizon, also known as a planning horizon, is a predetermined point in the future when operations will be evaluated or deemed accomplished. According to Saunders et al. (2019), the horizon is the period across which the study may be conducted, with the 'snapshot' temporal horizon being cross-sectional and the 'diary' perspective being longitudinal. Furthermore, the choice of a study strategy or techniques will be connected to the determination of an appropriate time horizon. Because time is restricted in this study, the researcher opts for cross-sectional investigations, which do not need a lengthy amount of time. The researcher performed the survey and data collecting for the study during a short period, from October to January. Data collection was completed as quickly as possible because it was critical for analysis and preventing complications while performing the research.

3.13 Summary

In this chapter, the researcher provided examples of how to collect data and information about the variables. It looks at the fundamental method for addressing research topics. A quantitative technique and an explanatory research design were used in this investigation. Both primary and secondary data sources were used in this investigation. As part of the research design, responses were gathered for this study using the survey approach. The researcher conducted cross-sectional pilot testing, questionnaire design, and sampling design for this study. In the data analysis portion, the researchers used the Statistical Package for Social Science (SPSS) to examine the data.

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

This chapter discussed the questionnaire results from respondents to the titled which is the impact of innovation among SMEs. The quantitative research has an effect on innovation among SMEs. SPSS software version 29.0 is used to code and key in all the results received from the questionnaires. Pilot testing was performed before collecting data for the actual survey and the data was then analyzed and interpreted. Then, an overall analysis was made after collecting the actual data from the actual study. All the questionnaire questions had been ensured to be responded to by all the respondents without any blanks to the questionnaire. Furthermore, the research objectives were the basis for the data and interpretation of the results.

4.2 Descriptive Analysis

The frequency and percentage of data samples for 201 respondents are summaries of hard-to-quantify data from survey questionnaire sets that are organized using descriptive analysis, which uses measures of frequency to determine how frequently a particular respondent characteristic is likely to occur.

To facilitate interpretation, demographic data will be shown in a chart, and all questionnaire responses from respondents will be shown in a table.

4.2.1 Respondent's Demographic Profile

The researcher employs frequency distribution to calculate the frequency of respondent profiles, which specifies the frequency features of respondents. The questionnaires were given to a total of 201 respondents for this study. All 201 respondents ' data was legitimate.

4.2.1.1 Gender

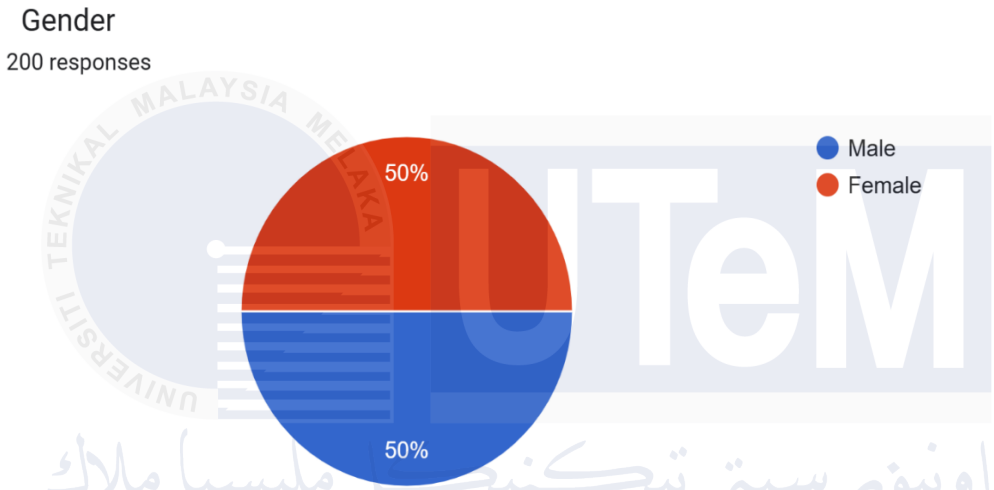


Figure 4.0: Pie Chart for Gender

The vast majority of female and male respondents are the same at 50%. This means that female and male respondents are equal and have their own businesses.

4.2.1.2 Age

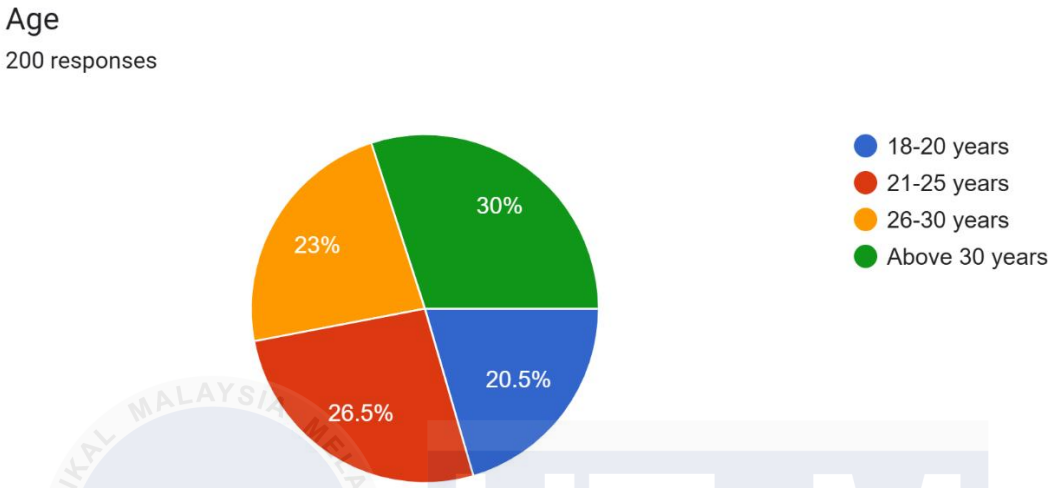


Figure 4.1: Pie Chart for Age

Figure 4.0 shows the age distribution of the respondents offering an insight into the impact of innovation on the increase in business run by small entrepreneurs. In particular, over 30 years of age is the largest segment, with a whopping 30% of participants included in this category. This shows that more entrepreneurs over the age of 30 have businesses.

The second largest group is 21 to 25 years old, representing 26.5% of respondents. This shows the significant presence of young individuals already involved in the business.

Although the age groups 18 to 20 years and 26 to 30 years represent a smaller share at 20.5% and 23% respectively, they still contribute to the overall age diversity in the survey.

4.2.1.3 Industry Sector

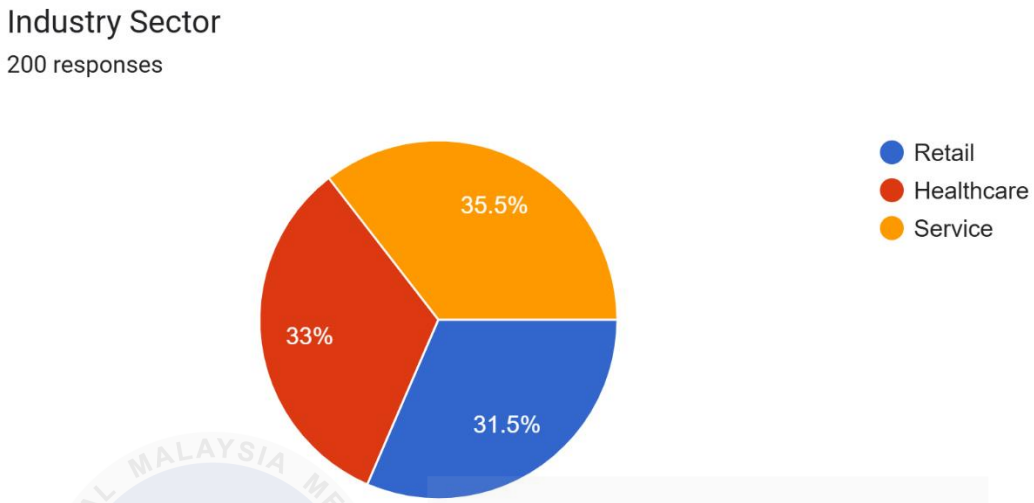


Figure 4.2: Pie Chart for Industry Sector

The growth and competitiveness of SMEs have long been attributed to innovation. The pie chart's industry sector distribution, Retail (31.5%), Healthcare (33%), and Service (35.5%) offers a chance to evaluate the ways in which innovation influences growth in these sectors, especially among SMEs.

One industry that demonstrates how innovation may spur SME growth is the service sector, which holds the biggest proportion at 35.5%. In order to increase productivity and scalability, SMEs in this industry such as those in the hotel, consultancy, and IT services sectors have been using digital transformation more and more. Artificial intelligence (AI), automation, and customer relationship management (CRM) software are examples of tools that have transformed service delivery and made it possible for SMEs to compete with bigger companies.

The healthcare industry, which accounts for 33% of the total, emphasizes how important innovation is to the expansion of SMEs. Emerging healthcare demands may now be effectively addressed by SMEs thanks to technological breakthroughs like wearable health devices, telemedicine, and AI-driven diagnostics. With 31.5% of the comments, the retail industry exemplifies how innovation can revolutionize SMEs.

4.2.1.4 Number of Employees

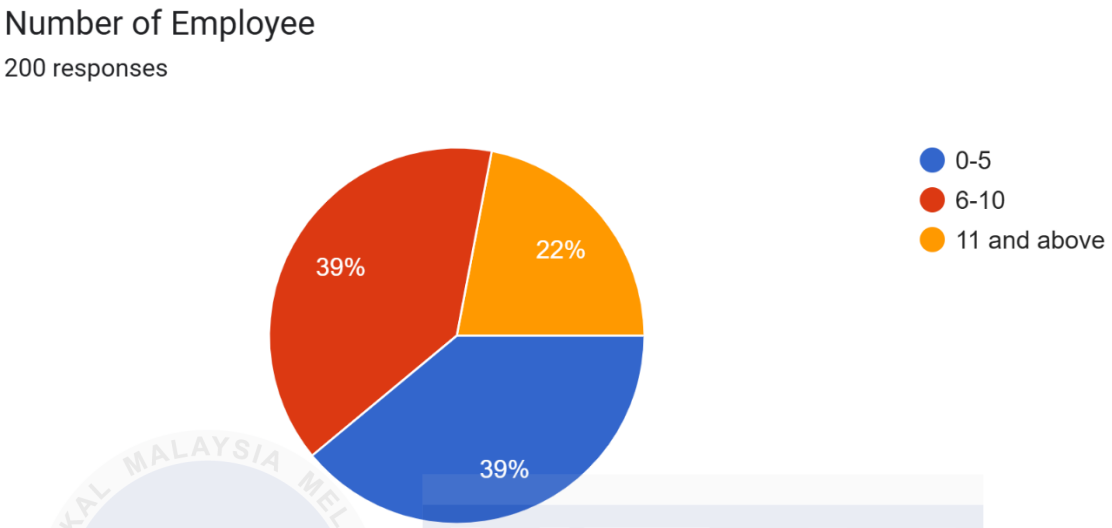


Figure 4.3: Pie Cart for Number of Employee

The data, which is based on 201 responses, divides businesses into three groups: those with 0–5 employees, those with 6–10 employees, and those with 11 or more employees. The pie chart provides important insights into the structure and challenges faced by different enterprises.

With 39% of the replies, a sizable percentage of enterprises are classified as having 0–5 employees. These companies are usually categorized as startups or micro-enterprises. These businesses are frequently characterized by a lack of human and financial resources, but they also have a high degree of flexibility and inventive potential. In a similar vein, 39% of businesses are classified as having 6–10 employees, demonstrating the importance of small businesses, which are frequently in the stage of transition from micro to more structured businesses, during which time they prioritize team building, operational optimization, and growth strategy exploration.

On the other hand, a smaller percentage of medium-sized businesses just 22% of businesses have 11 or more employees. These companies usually operate more steadily, have better access to resources, and are more organized.

4.2.1.5 Year in Operation

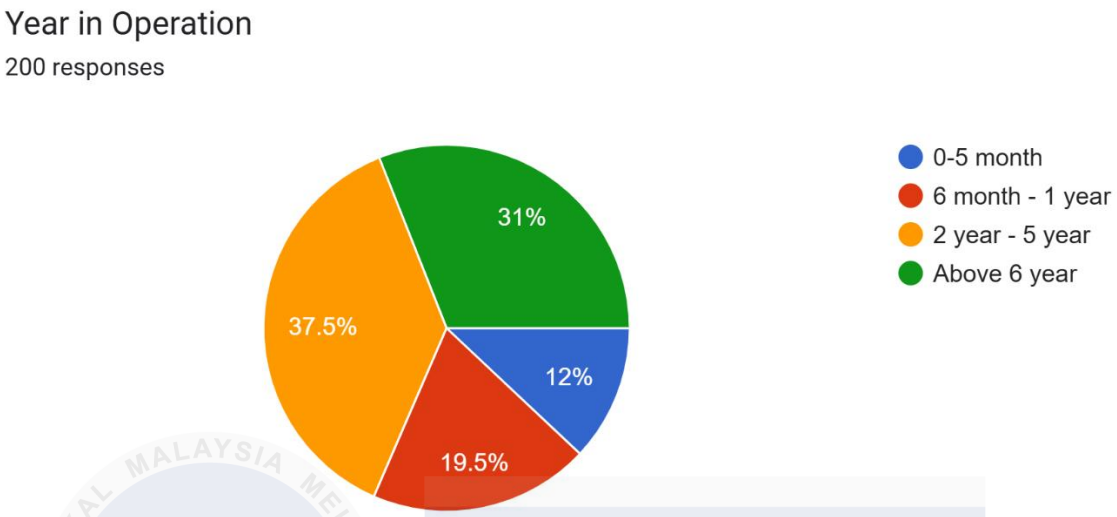


Figure 4.4: Pie Chart for Year in Operation

The pie chart on "Year in Operation" gives insights into the lifetime of enterprises based on 201 replies. The data is grouped into four groups: firms running for 0–5 months (12%), 6 months–1 year (19.5%), 2–5 years (37.5%), and above 6 years (31%).

The largest category, accounting for 37.5% of the responses, consists of companies that have been in business for two to five years. These companies are usually in the growth stage once they have established a steady revenue stream and customer base, at which point they tend to concentrate on expanding their operations, diversifying their offerings, and streamlining their processes for maximum efficiency. Businesses in this category account for 31% of the responses for the above 6 years, representing well-established firms that have survived beyond the critical early years. These businesses typically enjoy operational stability, market credibility, and a solid customer base.

This group includes slightly more established businesses (19.5%) for 6 months until 1 year. These companies are probably moving from the startup stage to the early stages of expansion. They must overcome important obstacles including obtaining operational stability, producing steady income, and gaining market validation throughout this time. These companies, which make up 12% of all answers for 0 until 5 months, are the most recent to enter the market. These companies, which concentrate on developing their goods, services, or market presence, are frequently in the ideation or early launch stages.

4.3 Mean Score Analysis for Variables

To find and obtain information about the features of certain issues, mean score analysis is utilized.

4.3.1 Technology Advancement (IV1)

TA1	Technological advancements have significantly increased our efficiency and productivity.
TA2	Using digital marketing tools has improved our customer reach and engagement.
TA3	Advanced technologies have enabled us to innovate and develop new products more effectively.
TA4	Data analytics tools have enhanced our decision-making processes.
TA5	Technology has helped us achieve significant cost savings in our operations.

Statistics

		TA1	TA2	TA3	TA4	TA5
N	Valid	201	201	201	201	201
	Missing	0	0	0	0	0
Mean		4.73	4.92	4.88	4.95	5.14
Std. Deviation		.953	.971	.980	.968	.965
Range		2	2	2	2	2
Minimum		4	4	4	4	4
Maximum		6	6	6	6	6

Table 4.4: Descriptive Statistics for Technology Advancement

With 201 valid replies and no missing data, the data shows descriptive statistics for five variables (TA1, TA2, TA3, TA4, and TA5). Key metrics including mean, standard deviation, range, minimum, and maximum are used to examine each variable.

From the results analyzed, the highest mean value is 5.14 and is associated with the item “Technology has helped us achieve significant cost savings in our operations”, while its standard deviation is 0.965. Next, the item on “Data analytics tools have enhanced our decision-making processes” had a mean value of 4.95 and standard deviation is 0.968. Furthermore, the mean value for item “Using digital marketing tools has improved our customer reach and engagement.” is 4.92 and its standard deviation is 0.971. Second last, the least mean of items on “Advanced technologies have enabled us to innovate and develop new products more effectively” is and gain the mean value of 4.88 with its standard deviation of 0.988 and last is “Technological advancements have significantly increased our efficiency and productivity” with mean value 4.73 and standard deviation 0.953 respectively.

4.3.2 Collaboration (IV2)

C1	Collaborations have provided us access to new markets.
C2	Partnering with other firms has allowed us to share resources and reduce costs.
C3	Joint ventures have helped us mitigate risks associated with new projects.
C4	Collaborations have enhanced our ability to innovate.
C5	Strategic partnerships have improved the efficiency of our supply chain.

Statistics

		C1	C2	C3	C4	C5
N	Valid	201	201	201	201	201
	Missing	0	0	0	0	0
Mean		4.77	5.13	4.93	4.75	4.92
Std. Deviation		.973	.993	.951	.942	.956
Range		2	2	2	2	2
Minimum		4	4	4	4	4
Maximum		6	6	6	6	6

Table 4.5: Descriptive Statistics for Collaboration

With 201 valid replies and no missing data, the presented data shows descriptive statistics for five variables (C1, C2, C3, C4, and C5). Important metrics that provide information on response patterns and trends across various variables are included in the study, including the mean, standard deviation, range, lowest, and maximum values.

According to the data, the item "Partnering with other firms has allowed us to share resources and reduce costs" has the greatest mean value (5.13), with a standard deviation of 0.993. The next item was "Joint ventures have helped us mitigate risks associated with new projects." Its standard deviation was 0.951 and its mean value was 4.93. Additionally, "Strategic partnerships have improved the efficiency of our supply chain" has a mean value of 4.92 and a standard deviation of 0.956. The item with the lowest mean, "Collaborations have given us access to new markets," has a mean score of 4.77 and a standard deviation of 0.973. The item with the highest score, "Collaborations have improved our capacity to innovate," has a mean score of 4.75 and a standard deviation of 0.942.

4.3.3 Access to Capital (IV3)

ATC1	Having sufficient capital has allowed us to expand our operations.
ATC2	Access to funding has enabled us to enter new markets.
ATC3	We have been able to invest in new technologies due to accessible capital.
ATC4	The availability of capital has facilitated our ability to innovate.
ATC5	With adequate capital, we can take advantage of emerging opportunities more effectively.

Statistics

		ATC1	ATC2	ATC3	ATC4	ATC5
N	Valid	201	201	201	201	201
	Missing	0	0	0	0	0
Mean		5.15	4.86	4.90	5.07	4.97
Std. Deviation		.975	.949	.980	1.008	.956
Range		2	2	2	3	2
Minimum		4	4	4	3	4
Maximum		6	6	6	6	6

Table 4.6: Descriptive Statistics for Access to Capital

Access to Capital's descriptive data is shown in Table 4.6. It demonstrates that each item has a minimum value of one and a maximum rating of six.

From the results analyzed, the highest mean value is 5.15 and is associated with the item “Having sufficient capital has allowed us to expand our operations.” its standard deviation is 0.975. Next, the item “The availability of capital has facilitated our ability to innovate” had a mean value of 5.07 and a standard deviation is 1.008. Furthermore, the mean value for the item “With adequate capital, we can take advantage of emerging opportunities more effectively” is 4.97 and its standard deviation is 0.956. Second last, the least mean of items on “We have been able to invest in new technologies due to accessible capital.” gained the mean value of 4.90 with a standard deviation of 0.980 and last is “Access to funding has enabled us to enter new markets” with a mean value of 4.86, and standard deviation 0.949 respectively.

4.3.4 Growth Among SMEs (DV)

DV1	We have successfully reduced operational costs while increasing profits.
DV2	We regularly explore opportunities for international expansion.
DV3	Innovation is a core part of our business strategy.
DV4	We have a strong focus on employee development and training.
DV5	Market competition poses a major challenge to our growth.

Statistics						
		DV1	DV2	DV3	DV4	DV5
N	Valid	201	201	201	201	201
	Missing	0	0	0	0	0
Mean		4.87	5.13	5.00	4.98	5.02
Std. Deviation		.993	.978	.990	.974	1.002
Range		2	2	2	2	2
Minimum		4	4	4	4	4
Maximum		6	6	6	6	6

Table 4.7: Descriptive Statistics for Growth Among SMEs

The descriptive statistics of growth among SMEs are shown in Table 4.7, where each item has a minimum rating of 4 and a maximum rating of 6.

From the results analyzed, the highest mean value is 5.13 and is associated with the item “We regularly explore opportunities for international expansion” while its standard deviation is 0.978. Next, the item “Market competition poses a major challenge to our growth” had a mean value of 5.02 and a standard deviation of 1.002. Furthermore, the mean value for the item “Innovation is a core part of our business strategy” is 5.00 and its standard deviation is 0.994. Second and last, the lowest mean of items on “We have a strong focus on employee development and training” and gained the mean value of 4.98 with a standard deviation of 0.974 and “We have successfully reduced operational costs while increasing profits” with a mean value of 4.87, and standard deviation 0.993 respectively.

4.4 Reliability Analysis and Validity Test

Table 4.8 below displays the reliability analysis of the data collected on each of the independent and dependent variables in this study. The following table shows the dependability value for each of the 20 items in the online survey that had 201 responses. At 0.949, the Cronbach's Alpha rating is significantly higher than 0.70. According to Malhotra (2012), in reliability analysis, a Cronbach's Alpha score of less than 0.60 is considered poor and untrustworthy. However, if the dependability value is more than > 0.70, it is considered excellent and good for acceptable. The reliability analysis of this study is generally quite good.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.949	.949	20

Table 4.8: Reliability Analysis of All Items

	Variables	Cronbach's Alpha	No. of Item	Result
Independent variables	Technology Advancement	0.925	5	Excellent
	Collaboration	0.831	5	Good
	Access to Capital	0.813	5	Good
Dependent variable	Growth among SMEs	0.887	5	Good

Table 4.9: Reliability Analysis for Each Variable

Cronbach's Alpha reliability analysis is shown in Table 4.9 for both independent and dependent variables in the research. All variables fall within the range of 0.813 to 0.925. These high dependability values demonstrate how good and in good shape each variable's full alpha coefficient value is. The Cronbach's Alpha values for technological development (α=0.925), collaboration (α=0.831), access to finance (α=0.813), and growth among SMEs (α=0.887) are all included in the above table.

4.5 Pearson Correlation Analysis

Pearson correlation analysis is one method for analyzing the relationship between one independent variable and one dependent variable. This method may also be used to assess the strength or degree of the relationship between the dependent variable the development of SMEs and the independent variables technology advancement, collaboration, and capital access. Regarding the intensity of the connection, the correlation coefficient varies from +1 to -1. Furthermore, a number around +1 or -1 indicates a significant correlation between two variables, whilst a value near 0 indicates a weak correlation.

Correlations

		TA	C	ATC	DV
TA	Pearson Correlation	1	.718**	.729**	.793**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	201	201	201	201
C	Pearson Correlation	.718**	1	.707**	.595**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	201	201	201	201
ATC	Pearson Correlation	.729**	.707**	1	.650**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	201	201	201	201
DV	Pearson Correlation	.793**	.595**	.650**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	201	201	201	201

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.10: Pearson Correlation Coefficient for Each Variable

Table 4.10 above illustrates the relationship between all independent factors, including technological development, teamwork, and capital availability, and the dependent variable, the growth of SMEs. Based on the correlation coefficient (r) values being greater than or within the range of 0.5 to 0.8, the results above clearly showed that all independent variables record a positive and significant association with the dependent variable. The test is significant, as shown by the correlation result of the first variable, which shows how technology has advanced toward the dependent variable (significant $r = 0.793$, p-value = 0.000, $p < 0.001$).

Subsequently, the correlation connection result for customer satisfaction indicated a substantial association with the second independent variable, cooperation. The reason for this is that the test correlation coefficient, $r = 0.595$, and the p-value, $p < 0.001$, are both equal to 0.000. Thus, there is a modest link between these two factors.

Access to money is another independent variable that influences the dependent variable, which is the expansion of SMEs. Table 4.10 shows that there was a substantial positive association between the element of access to capital and growth among SMEs ($r = 0.650$, p-value = 0.000, $p < 0.001$). As a result, both variables show a modest correlation.

4.6 Inferential Statistics

A random sample of data drawn from the population is used in inferential statistics as a method to find and assess them. Results from inferential statistics are important and can help with analysis, particularly when population evaluation is not at its best. Furthermore, inferential statistics are essential for assessing the reliability of sample differences and their likelihood of being the product of chance. Consequently, inferential statistics help to conclude the larger context of data collection.

4.6.1 Multiple Regression Analysis

Multiple regression analysis is a technique for forecasting a variable's value based on the values of two or more other variables. This method may be used to investigate the relationship between the independent and dependent variables. Furthermore, multiple regression analysis may be used to explain the relationship between all independent factors (Technology Advancement, Collaboration, and Access to Capital) and dependent variables (Growth Among SMEs). The findings of the regression analysis will be shown in an equation.

4.6.1.1 Multiple Regression Analysis Between DV and IV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.800[a]	.640	.634	.49572

a. Predictors: **(Constant), Technology Advancement, Collaboration, Access to Capital**

b. Dependent Variable: **Growth Among SMEs**

Table 4.11: Model Summary of Multiple Regression Analysis

A strong degree of correlation is indicated by the correlation coefficient (R), which has a value of 0.800 in the above table. Since the R-value is greater than 0.70, a positive and strong relationship has been found. The results of the regression analysis of the relationship between the independent and dependent variables are displayed in Table 4.11. The independent factors used in the assessment are technology development, teamwork, and capital availability, while the dependent variable is the growth of SMEs. Additionally, the model's R square value is 0.640, meaning that the independent variables technology advancement, collaboration, and access to capital have a 64.0% impact on the dependent variable, which is growth among SMEs. At the same time, additional factors not covered in this study have an impact on the remaining (100% - 64.0% = 36%).

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.950	3	28.650	116.588	<.001[b]
	Residual	48.410	197	.246		
	Total	134.360	200			
a. Dependent Variable: **Growth Among SMEs**						
b. Predictors: **(Constant), Technology Advancement, Collaboration, Access to Capital**						

Table 4.12: Regression Analysis on ANOVA

Table 4.12 shows the results of this research study's ANOVA analysis. The F-test is used to find survey data that fits the model well, as the table illustrates. The results show that the F value is 116.588 and the significant value, p, is 0.000, which is below the significance level of 0.01. Therefore, it is clear that each of the independent factors technology progress, collaboration, and capital access has a significant influence on the dependent variable, which is growth among SMEs.

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.912	.256		3.560	<.001		
	TA	.660	.066	.682	9.926	<.001	.387	2.585
	C	-.006	.073	-.005	-.077	.939	.413	2.421
	ATC	.174	.075	.156	2.309	.022	.399	2.506
a. Dependent Variable: **Growth Among SMEs**								

Table 4.13: Regression Analysis on Coefficients

The degree to which each independent variable influences the dependent variable is shown by the coefficient beta values in Table 4.13. For all independent variables, the findings in the following table show that B1 = 0.660, B2 = -0.006, and B3 = 0.174, respectively. The most important predictor of SME development turns out to be technological innovation. According to its unstandardized coefficient (B = 0.660, p < 0.001), when all other factors are held constant, a one-unit rise in technological progress results in a 0.660-unit increase in SME growth. The standardized coefficient (Beta = 0.682) further underscores the strength of this relationship, making (TA) the most impactful variable in the model. The t-value (9.926) and its significance level (p < 0.001) confirm that the relationship between technology advancement and SME growth is statistically significant. Additionally, the collinearity statistics (Tolerance = 0.387, VIF = 2.585) suggest no concerning levels of multicollinearity, ensuring the reliability of the results for TA.

Contrary to expectations, collaboration does not significantly influence SME growth in this model. Its unstandardized coefficient (B = -0.006, p = 0.939) implies that a one-unit change in collaboration has a negligible and statistically insignificant impact on SME growth. The standardized coefficient (Beta = -0.005) indicates a very weak and negative relationship. The t-value (-0.077) and the high significance level (p = 0.939) indicate that collaboration's effect on growth is not meaningful in this context. Collinearity statistics (Tolerance = 0.413, VIF = 2.421) suggest that this variable does not suffer from multicollinearity, but its lack of significance might require further investigation or a reconsideration of how collaboration is measured.

The growth of SMEs is somewhat but statistically significantly impacted by capital availability. When all other factors are held constant, the unstandardized coefficient (B = 0.174, p = 0.022) indicates that a one-unit increase in access to capital translates into a 0.174-unit rise in SME growth. ATC has a slight favorable effect on SME growth, according to the standardized coefficient (Beta = 0.156). Although not as strongly as TA, the t-value (2.309) and its significant level (p = 0.022) support the relevance of ATC as a predictor. Multicollinearity is at tolerable levels, according to the collinearity statistics (Tolerance = 0.399, VIF = 2.506).

The following mathematical analytical equation reveals the link, which is supported by Table 4.13 above:

$$\mathbf{Y = b0 + b1X1 + b2X2 + b3X3}$$

Where,

Y = Growth among SMEs

b0 = Regression Constant

X1 = Technology advancement

X2 = Collaboration

X3 = Access to capital

b1, b2, b3 = Regression Coefficient

Y (Dependent Variable) = 0.916 (Constant) + 0.660 (Technology Advancement) + -0.006 (Collaboration) + 0.174 (Access to Capital)

4.7 Hypothesis Testing

To evaluate the findings in light of the hypotheses that were previously put forward in Chapter 2, the researcher measured significant values. In statistics, hypothesis testing is frequently used to determine the outcomes of a hypothesis that is tested using sample data. The statistical sample will be tested using the hypothesis testing findings to determine whether the hypothesis is accepted or rejected. To measure all variables in this research study, a hypothesis test was conducted using the information acquired from regression analysis. By calculating the significant value, it will be possible to determine if the results in Table 4.13 were less than or more than 0.05.

Independent Variable	**Hypothesis**	**Result**
Technology Advancement	H1: The adoption of innovative technology creates new market prospects for organizations.	Supported
Collaboration	H2: Innovative collaboration leads to greater market expansion for firms.	Not Supported
Access to Capital	H3: Access to financing boosts the business growth potential for SMEs.	Not supported

Table 4.14: Hypothesis

4.8 Summary of Hypothesis Testing

Independent variables	**p Value**	**Result**
Technology Advancement	0.001	Supported H1
Collaboration	0.939	Not Supported H2
Access to Capital	0.022	Not Supported H3

Table 4.15: Result of Hypothesis

Table 4.14 indicates that a p-value of less than 0.05 is supported for all hypotheses, including H1. In the meanwhile, a P-value of more than 0.05 leads to the not support of H2 and H3.

4.9 Summary

The conclusion of this chapter explains all the data and conclusions gathered for this investigation. Using the Statistical Package for Social Science (SPSS Version 29), an online survey was used to gather data from 201 respondents. To accomplish the predetermined study goals, the data is interpreted using multiple regression analysis, reliability testing, correlation analysis, and descriptive analysis. Additionally, for hypothesis testing, this chapter gave the outcomes of the hypotheses that were addressed in Chapter 2. All four hypotheses were accepted in this research study since the significant value, p, was less than 0.05.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter provides a comprehensive summary of the main conclusions and revelations from the study and useful recommendations for further research in the same area. Based on the findings from the earlier chapters, the researcher makes recommendations and conclusions. In addition to acknowledging and outlining the limits of the current study and providing recommendations for future researchers interested in this field, the researchers thoroughly address and explore the research goals and aims.

5.2 Summary of Funding

The summaries of funding are accomplished based on the research objective:

Objective 1

To analyze the influence of technological innovation on the growth of SMEs, we will look at how the use of technological advances corresponds with SMEs' growth trends.

The findings for Research Objective 1 reveal that technological innovation is the most significant factor driving SME growth. The regression results (B = 0.660, Beta = 0.682, $p < 0.001$) indicate that for every one-unit increase in technology advancement (TA), SME growth increases by 0.660 units, making TA a highly influential predictor. From the previous research, (Brynjolfsson & McAfee 2014), found that technology adoption contributed significantly to faster revenue growth and better scalability for firms. They reported Beta values between 0.6 and 0.8. (OECD 2019), reported that SMEs adopting digital technologies experienced up to 10% higher growth rates than those that did not. Furthermore, the strong positive correlation ($r = 0.793$, $p < 0.001$) underscores the robust relationship between adopting innovative technologies and achieving business growth. These results highlight the critical role of technology in enhancing operational efficiency, reducing costs, and unlocking new market opportunities for SMEs. By integrating advanced technologies, SMEs can innovate, optimize decision-making through data analytics, and expand their customer reach using digital tools, positioning themselves for competitive advantages in evolving markets. The findings align

with the hypothesis that technology innovation creates new market prospects, reinforcing the necessity for SMEs to prioritize technological investments as a cornerstone for sustainable growth and long-term success.

Objective 2

To explore the impact of collaboration with other businesses on SME growth by understanding the processes via which collaborative efforts contribute to the expansion and development of SMEs.

The findings for Research Objective 2 indicate that collaboration with other businesses does not have a significant impact on SME growth in the context of this study. The regression results (B = -0.006, Beta = -0.005, p = 0.939) show that changes in collaboration levels have a negligible and statistically insignificant effect on SME growth. From the previous research, (Beck & Demirgüç-Kunt 2006), found that collaboration is a critical determinant for SME growth, especially in developing countries, with a Beta range of 0.25-0.35. Like (Beck & Demirgüç-Kunt, Ayyagari et al.) found a positive relationship between collaboration and SME growth, in contrast to my findings of insignificance. Despite a moderate positive correlation coefficient ($r = 0.595$, $p < 0.001$), the relationship between collaboration and SME growth lacks the strength and significance observed for other factors. (Zarif & Venkataraman 2014), argued that while collaboration is essential, its effect on growth is contingent on how well SMEs manage and utilize the funds. They found that Beta coefficients for collaboration were not always significant, indicating that collaboration was a key mediator. This suggests that, although collaboration may theoretically offer benefits such as access to new markets, cost-sharing, and resource optimization, these advantages were not reflected in the current model. The lack of significance might be due to limitations in how collaboration was measured, the quality or types of collaborations examined, or external factors such as market conditions or industry-specific challenges that could hinder the realization of collaborative benefits.

Given these findings, further investigation is necessary to determine how collaboration can be leveraged effectively for SME growth. Understanding the types of partnerships that yield the most value—such as strategic alliances, joint ventures, or co-innovation initiatives—may provide deeper insights. Moreover, external factors like industry dynamics, competitive pressures, and regulatory environments should be considered in future research.

In conclusion, collaboration, as measured in this study, does not emerge as a strong driver of SME growth. However, this does not imply that collaboration lacks potential value. SME managers should refine their approaches to collaboration by focusing on quality partnerships that align with their strategic goals and by integrating collaboration efforts with complementary strategies, such as technology adoption and market analysis, to maximize their growth potential.

Objective 3

Investigate the relationship between access to capital and SME growth capacity by looking at how the availability of financial resources affects an SME's ability to capitalize on new market possibilities.

The findings for Research Objective 3 reveal that access to capital (ATC) plays a statistically significant but moderately positive role in SME growth capacity. The regression results (B = 0.174, Beta = 0.156, p = 0.022) indicate that a one-unit increase in access to capital corresponds to a 0.174-unit increase in SME growth. From the previous, (Powell et al. 1996), found that inter-firm access to capital in the biotechnology sector led to positive outcomes for SMEs, including improved resource access, knowledge exchange, and increased growth. They reported Beta values between 0.12 and 0.18. (Li & Atuahene-Gima 2001), highlighted that access to capital was key to expanding markets and improving competitiveness for SMEs, with a Beta coefficient of around 0.10-0.20. (Hagedoorn 2002) study supports the idea of moderate growth effects from access to capital, as their Beta values align well with your 0.156. Additionally, the moderate correlation coefficient ($r = 0.650$, $p < 0.001$) supports the idea that access to financial resources has a meaningful, though not dominant, influence on growth. This suggests that while access to capital provides SMEs with the ability to expand operations, invest in advanced technologies, and capitalize on emerging market opportunities, its overall impact is tempered by other factors. For instance, the effectiveness of financial resources in driving growth may depend on managerial capabilities, the efficiency of resource allocation, the competitive landscape, or prevailing market conditions. SMEs with strong strategic planning and innovation capabilities may be better positioned to leverage financial resources for higher growth outcomes.

These findings emphasize the importance of access to capital as a foundational element for SME growth, but they also highlight its limitations when considered in isolation. To maximize growth potential, SMEs need to integrate financial resources with comprehensive strategies that include innovation, effective management practices, and market analysis. Policymakers and financial institutions should also consider these additional factors when designing support mechanisms for SMEs, such as providing training programs on financial management, fostering networks for innovation, and tailoring financial solutions to specific business needs.

In conclusion, while access to capital remains a vital driver of SME growth, it must be complemented by other critical elements to achieve its full potential. SMEs should adopt a holistic approach to growth by aligning financial resources with strategic initiatives, technological innovation, and market responsiveness, ensuring that they can fully capitalize on the opportunities provided by improved access to capital.

5.3 Recommendation and Conclusion

5.3.1 Recommendations

Based on the findings of this study, several strategic recommendations can be made to enhance the growth potential of SMEs. Firstly, given the significant positive impact of technological advancement on SME growth, SMES must prioritize investment in innovative technologies. This includes allocating budgets towards research and development (R&D), adopting cutting-edge digital tools, and continuously upgrading technological infrastructure. SMEs should also invest in training and development programs to ensure that their workforce is proficient in utilizing new technologies effectively. Additionally, fostering a culture of innovation within the organization can encourage employees to contribute creative ideas and solutions, further driving technological progress and operational efficiency.

Secondly, although collaboration with other businesses did not show a significant direct impact on SME growth in this study, it remains a valuable strategic approach when implemented effectively. SMEs should focus on forming high-quality partnerships that align with their strategic goals and offer mutual benefits. This involves selecting partners with complementary strengths, establishing clear objectives, and maintaining open communication channels. Furthermore, integrating collaborative efforts with other growth strategies, such as

technological innovation and market expansion, can enhance the overall effectiveness of partnerships. SMEs may also benefit from exploring diverse forms of collaboration, including strategic alliances, joint ventures, and co-innovation initiatives, to maximize the potential benefits of collaborative efforts.

Thirdly, it has been demonstrated that SME growth is moderately positively impacted by capital availability. SMEs should implement thorough financial management procedures that guarantee effective capital allocation and utilization in order to optimize the advantages of financial resources. This includes building comprehensive financial planning and budgeting systems, assessing financial performance periodically, and making educated investment decisions. Additionally, SMEs should seek out multiple funding sources, such as government grants, venture capital, and crowdfunding, to strengthen their financial stability and lessen dependency on a single source of money. To make it simpler for SMEs to obtain finance and create an atmosphere that supports their expansion, policymakers and financial institutions should collaborate to create customized financial products and support systems that cater to their unique needs.

5.3.2 Conclusion

This study has elucidated the critical factors influencing the growth of small and medium-sized enterprises (SMEs), with a particular focus on technological innovation, collaboration, and access to capital. The analysis revealed that technological advancement is the most significant predictor of SME growth, underscoring the pivotal role of adopting innovative technologies in enhancing operational efficiency, reducing costs, and creating new market opportunities. This finding aligns with the hypothesis that technological innovation fosters the creation of new market prospects, thereby driving sustainable growth for SMEs. Access to capital was found to have a significant yet moderate positive impact on SME growth, highlighting the importance of financial resources in enabling SMEs to expand operations, invest in technology, and seize emerging market opportunities. However, the moderate effect suggests that access to capital alone is insufficient and must be complemented by strategic planning and innovation to fully realize growth potential.

Conversely, collaboration with other businesses did not exhibit a significant direct impact on SME growth within the context of this study. This indicates that the effectiveness of collaboration may depend on various factors, including the quality of partnerships, the

alignment of strategic goals, and the integration of collaborative efforts with other growth strategies. Despite the lack of significant findings, collaboration remains a potentially valuable strategy that warrants further exploration and refinement.

By offering the tools and structures required to foster innovation and financial access, policymakers and financial institutions play a critical role in assisting SMEs. SMEs may improve their competitive edge and succeed over the long term in dynamic market settings by implementing a comprehensive strategy that incorporates technology, finance, and strategic alliances. The study's conclusion emphasizes how important financial availability and technical innovation are to the expansion of SMEs. SMEs should prioritize technology investments, maintain efficient financial management, and always look for methods to optimize teamwork to achieve sustainable development.

5.4 Limitations of Study

This study had some constraints during the research period. First off, compared to others who conducted surveys with respondents from the most diverse regions, the respondents' concentration on Melaka alone was not very thorough. Additionally, according to the sample size calculation, this study requires around 374 respondents; however, due to time and financial constraints, the number of respondents was reduced to 250. Therefore, before being applied to the entire Malaysian or global population, the results of this study must be improved. Second, the researcher is unable to verify that every responder is providing truthful and rational answers to the questionnaire. Finally, the researcher thinks that the respondents are knowledgeable about the research issue, comprehend the questionnaires that were given to them, and can justify their answers.

5.5 Summary

This study examined the key factors influencing the growth of small and medium-sized enterprises (SMEs), focusing on technological innovation, collaboration, and access to capital. The findings highlight that technological advancement is the most significant driver of SME growth, with a strong positive impact on operational efficiency, cost reduction, and the creation of new market opportunities. Access to capital was also found to have a moderate positive effect, enabling SMEs to expand operations, invest in innovation, and capitalize on emerging opportunities. However, collaboration with other businesses did not show a statistically significant influence on SME growth, suggesting that its effectiveness may depend on factors such as the quality of partnerships and strategic alignment. Overall, the study underscores the importance of technological innovation and financial resources in fostering SME success while encouraging a strategic revaluation of collaborative efforts. These insights provide actionable recommendations for SMEs to enhance their growth and sustainability by prioritizing technology investments, improving financial management, and refining partnership strategies.

REFERENCES

Ahmed Ibrahim Anyass, (2023). Unlocking the Growth Potential of SMEs in Ghana: An Investigation of Financial Management Practices and Challenges. https://www.researchgate.net/publication/376553467_Unlocking_the_Growth_Potential_of_SMEs_in_Ghana_An_Investigation_of_Financial_Management_Practices_and_Challenges

Ata Taleghani, (2022). Corporate Innovation Framework in Startups https://www.researchgate.net/publication/365302377_Corporate_Innovation_Framework_in_Startups

Christopher D. H. Wilson, (2005). Improving resource use and business performance in small and medium-sized companies. https://www.researchgate.net/publication/277717729_Improving_resource_use_and_business_performance_in_small_and_medium-sized_companies

Guilong Zhu, (2021). Knowledge Transfer Performance of Industry-University-Research Institute Collaboration in China: The Moderating Effect of Partner Difference. https://www.researchgate.net/publication/356680205_Knowledge_Transfer_Performance_of_Industry-University-Research_Institute_Collaboration_in_China_The_Moderating_Effect_of_Partner_Difference

Hussain Bux Marri, Zahir Irani and Angappa Gunasekaran, (2007). Advance Manufacturing Technology implementation in SMEs: a framework of justification criteria. https://www.inderscienceonline.com/doi/abs/10.1504/IJEB.2007.012969

Larysa Krysyuk, (2023). Strategy and tactics of business collaboration. https://www.researchgate.net/publication/375908909_STRATEGY_AND_TACTICS_OF_BUSINESS_COLLABORATION_CLUSTERING_AND_OTHER_JOINT_ACTIVITIES

Lucian Spulbar, (2024). The Influence of AI Technology in Stimulating Growth and Innovation in Business https://www.researchgate.net/publication/379664390_The_Influence_of_AI_Technology_in_Stimulating_Growth_and_Innovation_in_Business

Marian Holienka, (2017). Attitude towards Innovation and Barriers in Capital Access. https://www.researchgate.net/publication/319365739_Attitude_towards_Innovation_and_Barriers_in_Capital_Access

Marius-Daniel Mitrache, (2024). The Influence of AI Technology in Stimulating Growth and Innovation in Business. https://www.researchgate.net/publication/379664390_The_Influence_of_AI_Technology_in_Stimulating_Growth_and_Innovation_in_Business

Md. Shah Azam, (2023). Understanding the Concept of SMEs in Driving Economic Growth and Development in Bangladesh https://www.researchgate.net/publication/375590254_Understanding_the_Concept_of_SMEs_in_Driving_Economic_Growth_and_Development_in_Bangladesh

Mohamad Zulkifli Abdul Rahim, (2024). Business Model Innovation as a Structural Framework for Business Sustainability Growth: A Systematic Review https://www.researchgate.net/publication/377997172_Business_Model_Innovation_as_a_Structural_Framework_for_Business_Sustainability_Growth_A_Systematic_Review

Oluwatosin Abdul-Azeez et al. (2024). Enhancing business performance: The role of data-driven analytics in strategic decision-making. https://www.researchgate.net/publication/382053812_Enhancing_business_performance_The_role_of_data-driven_analytics_in_strategic_decision-making

Purnomo budi Santoso, (2022). Identifying Driving Factors of Technological Innovation to Create Sustainable Value in Metal Manufacturing SMEs. https://www.researchgate.net/publication/360077713_Identifying_Driving_Factors_of_Technological_Innovation_to_Create_Sustainable_Value_in_Metal_Manufacturing_SMEs

Sohail Amjad, (2024). The Role of Law in Promoting Sustainable Business Innovations https://www.researchgate.net/publication/379535102_The_Role_of_Law_in_Promoting_Sustainable_Business_Innovations

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students (8th ed.). Education Limited. Retrieved from https://www.pearson.com/uk/educators/higher-education-educators/program/Saunders-Research-Methods-for-Business-Students-8th-Edition/PGM3308064.html

Tetiana Reshetilova, (2021). Consumer research in the process of creation and distribution of innovative products. https://www.researchgate.net/publication/352928159_CONSUMER_RESEARCH_IN_THE_PROCESS_OF_CREATION_AND_DISTRIBUTION_OF_INNOVATIVE_PRODUCTS

Tochukwu Ignatius Ijomah et al. (2024). Innovative digital marketing strategies for SMEs: Driving competitive advantage and sustainable growth. https://www.researchgate.net/publication/382058384_Innovative_digital_marketing_strategies_for_SMEs_Driving_competitive_advantage_and_sustainable_growth

Umang Mittal, (2023). Innovation in Business Management: A Critical Examination of Small Business Success https://www.researchgate.net/publication/377814527_Innovation_in_Business_Management_A_Critical_Examination_of_Small_Business_Success

Zhao Wang, (2019). Progression from technological entrant to innovative leader: an analytical firm-level framework for strategic technological upgrade. https://www.researchgate.net/publication/331553532_Progression_from_technological_entrant_to_innovative_leader_an_analytical_firmlevel_framework_for_strategic_technological_upgrade

APPENDIX A

QUESTIONNAIRE

THE IMPACTS OF INNOVATION ON GROWTH AMONG SME

Dear Respondent,

This survey is part of the Final Year Project, The Purpose of the research is to identify "The Impacts Of Innovation On Growth Among SMEs" and this questionnaire is designed to collect data from SMEs in Melaka. This survey is only for research purposes and all the information provided by respondents is confidential, private, and protected: no misrepresentation of data will be carried out. The results of this study will help the organization work more productively.

You are requested to spare 15 minutes to fill out this questionnaire. Please fill it out completely. Your cooperation is highly appreciated.

If there is any confusion, misunderstanding, or questions, please email me at or call me at .

SECTION A: RESPONDENT BACKGROUND

Please complete the following questionnaire with specific regard to the above, by placing a **CROSS in the appropriate box.**

GENDER:

Female ☐

Male ☐

AGE:

18-20 years ☐

21-25 years ☐

26- 30 years ☐

Above 30 years ☐

INDUSTRY SECTOR:

Retail ☐

Healthcare ☐

Service ☐

NUMBER OF EMPLOYEE:

0 - 5 ☐

6 - 10 ☐

11 and Above ☐

YEAR IN OPERATION:

0month – 5month ☐

6month – 1year ☐

2year – 5year ☐

Above 6year ☐

SECTION B: ASSESSMENT ON INDEPENDENT VARIABLE (IMPACTS OF INNOVATION)

Please indicate your level of agreement with the following statements **(1 = Strongly Disagree, 6 = Agree)**

	Questions	1 Strongly Disagree	2 Fairly Disagree	3 Disagree	4 Strongly Agree	5 Fairly Agree	6 Agree
TA1	Technological advancements have significantly increased our efficiency and productivity.						
TA2	Using digital marketing tools has improved our customer reach and engagement.						
TA3	Advanced technologies have enabled us to innovate and develop new products more effectively.						
TA4	Data analytics tools have enhanced our decision-making processes.						

TA5	Technology has helped us achieve significant cost savings in our operations.						
C1	Collaborations have provided us access to new markets.						
C2	Partnering with other firms has allowed us to share resources and reduce costs.						
C3	Joint ventures have helped us mitigate risks associated with new projects.						
C4	Collaborations have enhanced our ability to innovate.						
C5	Strategic partnerships have improved the efficiency of our supply chain.						
ATC1	Having sufficient capital has allowed us to expand our operations.						
ATC2	Access to funding has enabled us to enter new markets.						

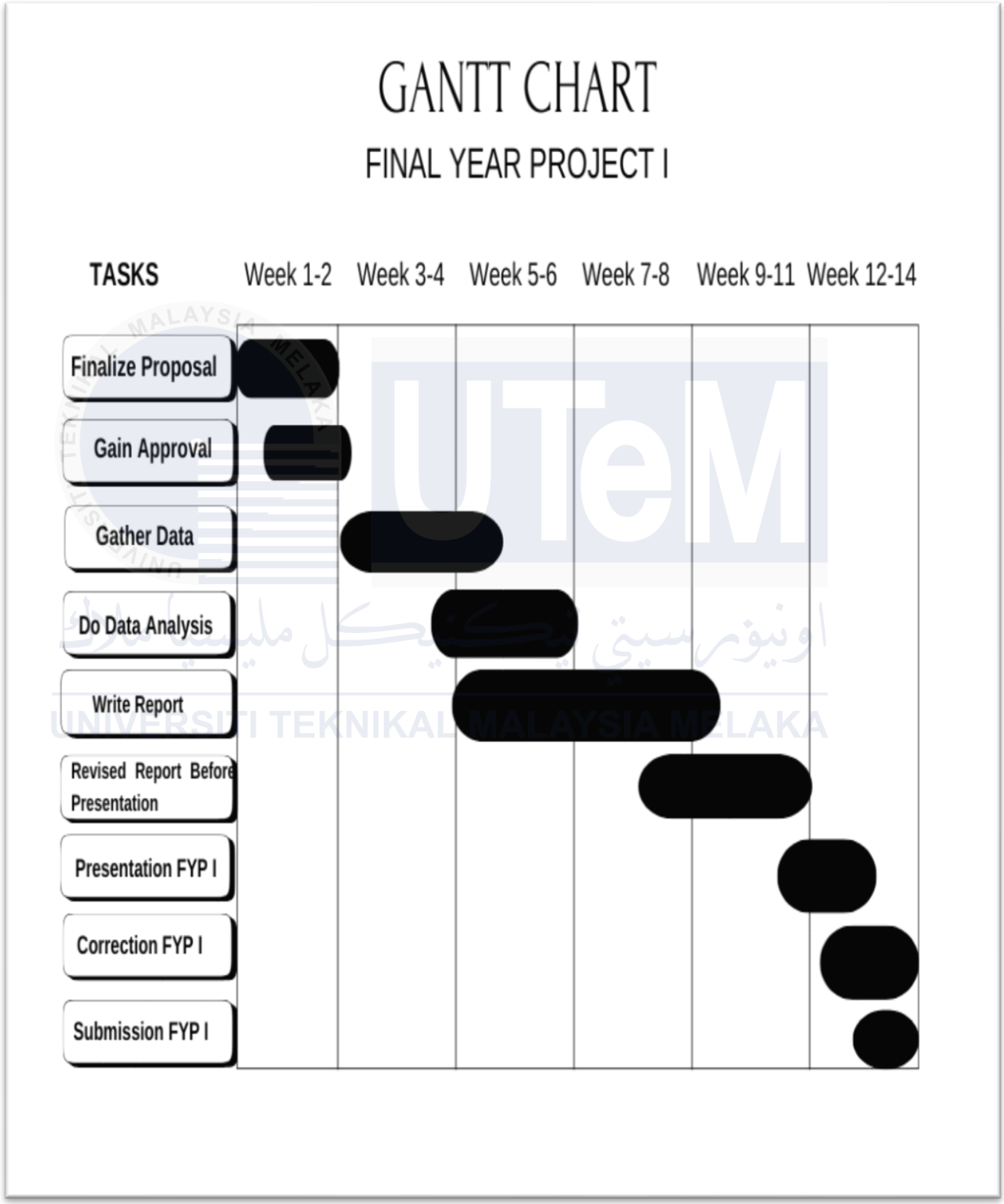
ATC3	We have been able to invest in new technologies due to accessible capital.						
ATC4	The availability of capital has facilitated our ability to innovate.						
ATC5	With adequate capital, we can take advantage of emerging opportunities more effectively.						

SECTION C: ASSESSMENT ON DEPENDENT VARIABLE (GROWTH AMONG SME)

Please indicate your level of agreement with the following statements **(1 = Strongly Disagree, 6 = Agree)**

	Questions	1 Strongly Disagree	2 Fairly Disagree	3 Disagree	4 Strongly Agree	5 Fairly Agree	6 Agree
1	We have successfully reduced operational costs while increasing profits.						
2	We regularly explore opportunities for international expansion.						
3	Innovation is a core part of our business strategy.						
4	We have a strong focus on employee development and training.						
5	Market competition poses a major challenge to our growth.						

APPENDIX B



APPENDIX C