THE EFFECTIVENESS OF SMART FARMING IN MALAYSIA AGRICULTURE SECTOR

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The thesis is submitted in partial fulfilment of the requirement for the award of bachelor's degree of Technology Management (Innovation) with Honours.

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this thesis and this thesis are adequate in terms of
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DEDICATION

Every challenging job requires self -effort and guidance
as well as strength from Allah SWT as well as parents. My humble efforts
I dedicate to: Allah SWT, respected lecturers, mothers, friends, and seniors
who provided guidance, strength, and skills to the researcher in completing this thesis.

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ABSTRACT

"The Effectiveness of Smart Farming in Malaysia agriculture sector" has contributed to improving the quality and quantity of the country's agriculture in addition to the use of advanced new technology. The dominant explanation for this trend is the use of Smart Farming in agriculture with the independent factors of performance expectations, effort expectations, social influence and facility conditions. Previous studies have used the UTAUT Theory in this research related to agriculture, therefore the researcher also used it as a guide in completing this research. The researcher uses data from SPSS which is the result of descriptive analysis and reliability analysis to explain the correlation between the four factors and the adoption of Smart Farming. The effectiveness of Smart Farming can be recognized in terms of increasing firm production, revenue, and reducing expenses in the agricultural industry. Our findings indicate that the adoption of Smart Farming cannot be explained by hypotheses centered on social influence and facilitation condition, and they show where in this process inequality is generated and where it is not.

ABSTRAK

"Keberkesanan Pertanian Pintar di sektor pertanian dalam Malaysia" telah menyumbang kepada peningkatan kualiti dan kuantiti pertanian negara di samping penggunaan teknologi baharu yang canggih. Penjelasan dominan untuk trend ini ialah penggunaan Smart Farming dalam pertanian dengan faktor bebas jangkaan prestasi, jangkaan usaha, pengaruh sosial dan keadaan kemudahan. Kajian terdahulu telah menggunakan Teori UTAUT dalam penyelidikan berkaitan pertanian ini, justeru pengkaji turut menjadikannya sebagai panduan dalam menyiapkan penyelidikan ini. Pengkaji menggunakan data daripada SPSS yang merupakan hasil analisis deskriptif dan analisis kebolehpercayaan untuk menjelaskan perkaitan antara empat faktor dengan penggunaan Smart Farming. Keberkesanan Smart Farming boleh diiktiraf dari segi meningkatkan pengeluaran firma, hasil, dan mengurangkan perbelanjaan dalam industri pertanian. Penemuan kami menunjukkan bahawa penggunaan Perladangan Pintar tidak dapat dijelaskan oleh hipotesis yang berpusat pada pengaruh sosial dan keadaan fasilitasi, dan ia menunjukkan di mana dalam proses ini ketidaksamaan dijana dan di mana ia tidak..

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CHAPTER 1

1.0 INTRODUCTION

1.1 BACKGROUD OF STUDY

Farming in basic terms is the cultivation of food, crops, and animals. Agriculture has been considered an art for centuries, since it involves skill and devotion. Farming is essential to the survival of all life on earth, and the output of farming is directly related to human consumption. Agriculture has been the source of both raw and finished commodities, ranging from industrially produced goods to field-grown produce. Farming is essential not just for human survival, but also for the preservation of the planet's biodiversity. It has provided individuals with economic opportunities and physical activities. (Bhanu Garg, 2019). These goods, as well as the farming practises used, may differ from one region to the next. Agriculture's expansion has aided the emergence of civilizations throughout the millennia. People used to spend the majority of their time hunting wild animals and harvesting wild vegetation before agriculture became widely available. People began to learn how to cultivate grain and root crops about 11,500 years ago, and they eventually settled down to a farming lifestyle (Poovenraj Kanagaraj, 2021). Agriculture has been the main source of income for most of the world's inhabitants by 2,000 years ago.

Smart Farm (SF) refers to the incorporation of information and communication technology into agricultural equipment and sensors for use in crop growing and food production. Internet of Things (IoT) and different electronic instruments (robots and artificial intelligence) with data transformation and signalling facilities worlds, such as smart homes, smart health care, and now the agricultural sector, are prevalent in the current period of sophisticated technology. Currently, farmers may use IoT to increase

farm efficiency, such as irrigation, fertiliser, harvesting data, and climate forecasting, by monitoring using sensors to improve decision making (Tisserye, 2015). This innovation helps farmers to make more informed choices on the management of their farms by maximising the use of available resources, hence increasing productivity and profitability.

The research of Schumpeter (A. Kaloxylos, 2016), which highlighted the core of economic growth in connection to innovation, has sparked one of the debates regarding new technologies. Technological innovation alters production patterns and may differentiate between regional and national economic growth (J.A. Schumpeter, 2019). The inclusion of automation and chemistry into the agriculture sector has resulted in significant structural changes. This is an example of a technological-economic paradigm that has had a broad impact on the economy. The current application of the internet of things in smart settings, as well as cloud computing, may represent a new technological and economic paradigm (M. Hoffmann, 2014). However, in order to transform the techno-economic paradigm, all of the flaws and problems must be successfully solved in order to witness the efficacy and get fatmaatnya in the future.

1.2 PROBLEM STATEMENT

Smart farming is an example of how current communication technologies are being used in agriculture to bring about the third green revolution. With Internet of Things (IoT), Big Data, and sensor technologies, the third green revolution will give agriculture a new dimension. A lot of technical advancements in farming have occurred during the last several decades, making the practise more industrialised and technology-driven. Even the planting and watering of crops may benefit from technology improvements in agriculture. Automation and the Internet of Things (IoT) will have a huge impact on agriculture, allowing farmers to achieve more with less work. This is what's fueling the growth of Smart Farming technologies, in my opinion. The term "smart farming" refers to the use of technology such as IoT, robots, drones, and AI to raise the quantity and quality of goods while reducing the amount of human labour necessary for the production process (Robert,

2019). As Smart Agricultural technology advances, the Internet of Things (IoT) is becoming a more important part of the farming process.

However, building a smart agriculture system may not be as easy as just deploying a couple of sensors in the field. Though there are several benefits linked with precision agriculture, it also presents certain challenges to farmers and agribusiness owners that need to be overcome to ensure greater efficiency and maximum profitability. As technology advances and big data and the Internet of Things become more important parts of agricultural operations, having a reliable and consistent internet connection has become a typical difficulty, particularly in rural areas. To operate effectively and interpret gathered data, most precision agricultural procedures need stable internet access — 4G or higher. The adoption of digital technologies will be hampered by a lack of strong connection, as well as poor network performance and bandwidth speeds, which will slow the emergence of smart farming and food production (Admin, 2021).

Eventhough there are numerous research in this domain, there are still some unanswer question. First, there is no investigation into the relationship between the costs used in the implementation of this new technology between Smart Farming. Many major farm owners believe that implementing Smart Farming in this industry would be prohibitively expensive before doing any additional research (Aurell.G, 2018). While the initial costs of Smart Farming are considerable, they are very cost-effective in the long run. As a result, the cost of paying labour costs may also be decreased by simply relying on modern technology to produce huge amounts of high-quality crops.

Second, the link between Smart Farming and communities that undervalued modern technology was not investigated (Elvin, 2019). Having employed the same agricultural practices for decades, the people in the area have become used to them and are less interested in experimenting with new ones. It is possible for certain cultures to produce higher-quality crops via traditional plant cultivation than with the use of technology since they may inspect each plant one at a time for its quality and condition. They don't know that employing technology to cultivate plants results in higher-quality

crops (Rine, 2017). As a result, each Smart Farming technology is capable of not only watering and fertilizing, but also analyzing the pH rate and quality of seedlings that have been sown.

For the record, there has been no inquiry into the connection between Smart Farming and the more in-depth disclosures by those in charge. Promote Smart Farming equipment in supermarkets, highlight the necessity of using cutting-edge technology in agriculture, and provide public classes on how to use them to guarantee that the public is aware of a new technology and responds positively to it.

Therefore, it is necessary to better understand the short -term and long -term importance of Smart Agriculture to human life. This study will help identify the advantages of Smart Faming in the agricultural sector. This study will also explore the extent of the effectiveness of Smart Plantation in the Malaysian agricultural sector if it can be implemented successfull.

1.3 RESEACH OBJECTIVE

The effectiveness of Smart farming on agriculture in Malaysia is studied with several objectives. There are three objectives created to achieve the main goals of research:

1. To identify the factors impacting the adoption of Smart Farming.
2. To investigate the most significat factors of Smart Farming.

1.4 RESEACH QUESTION

The following research questions may be derived from the aforementioned research objective:

1. What are the factors impacting the adoption of Smart Farming.
2. What are the most significat factors of Smart Farming

1.5 SCOPE OF STUDY

The scope of the study defines the extent to which the research topic will be investigated and the limits within which the investigation will operate. Therefore, the purpose of this study is to find out the extent of the effectiveness of Smart Farming to the local community and the country in the next 10 years. Google form were the method chosen to conduct this study. Farmers who have been using Smart Farming in vegetable growing areas in the state of Malacca have been the focus of data collection. They are among those who can contribute to the country's economic progress by implementing innovative technologies.

Research will be conducted internally through selected locations and will involve organizations that practice Smart Farming technology in the local agriculture sector. There is some agricultural areas in Malaysia will be randomly selected using simple random sampling to contribute in this questionnaire session. The questionnaire will be conducted online to farmers and the general public who know a lot about this Smart Farming technology through an online google form survey. Finally, this analysis uses a case study to extend its findings. Because of the case studies, my research became more focused and manageable.

1.6 LIMITATION OF STUDY

There are various limitations to this study that prohibit researchers from accessing full and significant data. Limitations are flaws, circumstances, or forces outside of the researchers' control that constrain study technique and results (Baltimore Country Public School, 2014). In order to attain the aims described in the preceding paragraph, the interview survey method will be employed in this research. The time constraint was the first issue that arose throughout the research. Data collection from respondents is a time-consuming process. To acquire an accurate sample and restrict geographical coverage, the researcher spent almost a month to gather replies from the chosen respondents.

As a result, getting a complete target survey will take longer than intended. The time constraint also allows the study to collect as much data as possible from the respondents and determine the degree to which Smart Farming in Malaysia is beneficial to the local population. Another weakness of this research seems to be the correctness of the findings. This research does not cover every state in Malaysia due to time restrictions. These respondents were deemed to have delivered truthful and accurate responses in this survey.

1.7 SIGNIFICANT OF THE STUDY

The most significant aspect of this study is to identify creative behaviours among agricultural company personnel. The findings of this study may be utilised by other businesses or plantations to assist them rectify any inefficiencies that are hindering their efficiency. Many firms are able to find new behaviours among farmers in the agricultural industry by doing this study. It is critical for businesses to understand their workers' creative behaviour. It may assist businesses in continuing to develop in order to boost productivity. This research will benefit both students and companies as it will help them better understand the effectiveness of this Smart Farming technology to the development of the country. In addition to providing better knowledge on the triggering factors for the existence of this technology in the Malaysian agricultur sector.

As a result of this research, instructors will be better prepared to explain the pros and cons of this Smart Farming, as well as the impact on the organization if it is practiced on their own. It is expected that future researchers will benefit from this study as it will offer them some information they may need in their own research, as well as the opportunity to get some of their questions answered by the researchers involved in this study.

1.8 SUMMARY

This chapter will begin with the introduction and background of the study, followed by a description of the problem, the purpose of the study, and the research questions. The scope of the investigation and the limitations encountered while doing this research are also discussed. Finally, reeeit concludes with an important study that explains the contribution of this research. The literature review will be expanded in Chapter 2. In Malacca there have been several companies that practice Smart Farming technology that is easily seen by the public themselves, which is considered a quality standard in Malaysian agriculture. The majority of companies agree that it is mainly used to predict the increase of national income and systematically promote technology to employees, implement resource skill matrix, use existing workforce productively.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is a piece of academic writing that demonstrates knowledge and grasp of the academic literature on a particular subject in context. A literature review involves a critical assessment of the content, which is why it is termed a review rather than a report. Consider television or film review articles to demonstrate the distinction between reporting and reviewing. These articles offer information such as a short overview or major aspects of the film or show, as well as the critic's personal assessment. Similarly, the two major goals of a literature review are to summarise current research, hypotheses, and evidence, and then to critically evaluate and debate this information. A literature review is often included as a portion or component of a dissertation, research project, or lengthy article. It may, however, be assigned and graded as a separate piece of work.

2.2 DEFINITION

2.2.1 AGRICULTURE

Agriculture is made up of two Latin words: ager or agri, which means soil, and cultura, or Cultus, which means cultivation. Agriculture is an applied science that encompasses all aspects of crop production, including horticulture, livestock rearing, fisheries, and forestry, and is also defined as an art, science, and business of producing crops and livestock for economics, according to Rudd, James, Butson, Michael, Barnett, Lisa, Farrow, Damian, Berry, Jason, Borkoles, Erika, and Polman, Remco at 2016 in Agriculture Definition.

John R. Beard's work has been adapted in the Jurnal Agriculture stuff at 2019, it is frequently said that particular species of beetle, ant, and termite have been cultivating crops for 60 million years prior to human activities. It's defined in several ways, but at its broadest level, it's defined as the use of natural resources to "create commodities that support life, such as food, fibre, forest products, horticultural crops, and associated services." Arable farming, horticulture, animal husbandry, and forestry are all included purposes.

According to Osman Rahman's paper "Definition of Agriculture, Its Branches" from 2019, agriculture is divided into three branches: art, science, and commerce. It comprises knowledge of how to carry out farm activities in a skillful way, but not necessarily a grasp of the concepts behind agricultural practise, as it does in the realm of art. As a science, maximising outcomes and revenues by using all technologies established based on scientific concepts such as crop reproduction, production engineering, crop protection, economics, and so on. New crops and hybridised varieties, for example, transgenic plant varieties resistant to pests and diseases, deep hybrids per crop, highly sensitive fertiliser types, water management, weed control herbicides, and the use of biocontrol agents to battle pests and diseases, to name a few.

Definition as a company also defined by Khairul.N in the Agriculture in Malaysia at 2021, which is as long as agriculture constitutes the rural population's way of life, the end output is linked to consumption. Agriculture, on the other hand, as a company, seeks to maximise net return by managing land, water, and capital labour while using scientific knowledge to the production of food, feed, fibre, and fuel. Agriculture has been commercialised in recent years, with automation allowing it to be handled as a company.

2.2.2 SMART FARMING

Smart farming is a management concept focused on providing the agricultural industry with the infrastructure to leverage advanced technology – including big data, the cloud, and the internet of things (IoT) – for tracking, monitoring, automating, and analysing operations, according to Corinne Bernstein in the Smart Farming jurnal in 2019. Smart farming, often known as precision agriculture, is controlled by software and monitored by sensors. Smart farming is becoming more important as the world's population grows, as does the desire for greater agricultural yields, the need to conserve natural resources, the increased usage and complexity of information and communication technology, and the growing need for climate-smart agriculture.

According to the Cropin Website's Journal Smart Farmin Technologies, Smart Farming focuses on the utilisation of data obtained from multiple sources (historical, geographical, and instrumental) in the management of farm operations. It is not always the case that a technologically sophisticated system is a smart system. Smart agricultural technologies distinguish themselves by their capacity to collect and interpret data. Smart farming uses hardware (Internet of Things) and software (Software as a Service or SaaS) to collect data and provide actionable insights to manage all agricultural activities, both before and after harvest. The data is well-organized, always available, and chock-full of information on every facet of finance and field operations that can be accessed from anywhere in the globe.

2.2.3 UTAUT THEORY

A theory is a sort of logical abstract reasoning about a reality, or the outcomes of such thinking. Contemplative and rational thinking are often linked to procedures like observational inquiry or study. Theories might be scientific, non-scientific, or have no affiliation with any field. A theory's statements may contain

generic explanations of how nature works, for example, depending on the situation. Although the word's origins are in ancient Greek, it now has a variety of connotations in current use.

The word "theory" is used in contemporary science to refer to scientific theories, which are well-confirmed types of natural explanations developed using the scientific process and meeting modern science's standards. Such theories are formulated in such a manner that scientific testing should be able to offer empirical support (or falsify) for them. In contrast to other popular usage of the term "theory," which indicate that something is unverified or speculative, scientific theories are the most dependable, rigorous, and complete form of scientific knowledge. (which in formal terms is better characterised by the word hypothesis). In 2018, the Institute of Medicine of the National Academy of Sciences reported. Science, evolution, and creationism are all topics that are discussed in this article. Theories differ from hypotheses, which are individual empirically tested conjectures, and scientific laws, which are descriptive explanations of how nature operates under given situations, according to Washington.

Venkatesh and colleagues developed the notion of unified technology acceptance and usage (UTAUT) as a technology acceptance paradigm in "User acceptance of information technology: Towards a unified vision." UTAUT seeks to explain users' intents to utilise the information system and subsequent use patterns, according to Viswanath's essay from 2019. There are four key elements according to this theory: 1) performance expectations, 2) effort expectations, 3) social influence, and 4) enabling context.

This theory was created by reviewing and combining eight model constructs that have previously been used to explain information system use behaviour (reasoned action theory, technology acceptance model, motivation model, planned behaviour theory, combination of planned behaviour

theory./Acceptance model. technology, personal computer use models, innovation dissemination theory, and social cognitive theory). Venkatesh et al. (2018) showed that UTAUT accounted for 70% of the variation in Behavioral Intent for Usage (BI) and nearly 50% of the variance in actual use in a longitudinal study. Researchers employ the Utaut theory to finish the study of the agricultural sector Smart Farming.

2.3 FACTORS IMPACTING THE ADOPTION OF SMART FARMING IN AGRICULTURE MALAYSIA.

Adoption of technology refers to the acceptance, incorporation, and use of new technologies in society. Typically, the phases are defined by the categories of individuals who use the technology. In this research, behavioural intention evaluates the attitude of prospective Smart Farming users, with the relationship between the independent variables assumed to exist.

Approximately 8% of Malaysia's GDP comes from agriculture, fishery, and forestry, and they employ about 10% of the country's work force. About half of the production comes from palm oil, rubber, cocoa, and wood products, while other major contributions include tropical fruits and grains.Based on data from the International Trade Administration's website as of the year 2016, Malaysia is the second biggest palm oil production and exporter in the world, behind only Indonesia. By 2020, Malaysia's palm oil output will account for 26% of global production and 34% of global exports. The only way to boost national output of palm oil at this time is via increased yield and productivity, since no new land is available for cultivation.

In addition to their extensive presence in Indonesia, Malaysian palm oil firms have financed the construction of palm oil refineries in key consumer regions like the European Union, India, China, and the United States. The government of Malaysia has a majority stake in several of the country's biggest and most prosperous palm oil plantation businesses. As Malaysia is a large producer of crops, therefore the use of new

technologies needs to be expanded in order to improve the quality and quantity of crops in our country.

2.3.1 PERFORMANCE EXPECTANCY

Performance expectations related to the assessment of potential users about the level of use of new technologies improve task performance in a particular environment, in this case agricultural agriculture. Based on variable performance expectations connected to four indicators namely benefits, efficiency, and effectiveness, and the final indicator, Productivity, with expectations of consumer performance in the agricultural sector on Smart Farming technology. According to Zuiderwijk, Jansen, and Dwivedy, the realization of 2015 expectations is a changeable factor in one's acceptance and use of a new system or technology.

Thus, it can be concluded that the better the variable, as well as one's desire in acquiring and using the system or technology, the greater its effectiveness. According to Zuiderwijk, Jansen, and Dwivedy (2015), if a technology, especially in Smart Farming, makes a job or activity more efficient, then the use of that technology will be improved by the public. Based on this, administrators in the field of agriculture should increase the use of Smart Farming in agriculture in Malaysia by increasing the level of reporting of technological achievements by increasing the human resources (HR) working in the government in this matter. Smart Farming was seen as a good development by all involved. Smart Farming, according to many, is simply the process of using technology to assist farmers in making better choices.

2.3.2 EFFORT EXPECTANCY

The degree to which users feel the system will be easy or difficult to use is called effort expectation. It considers not only the financial aspects but also the

temporal aspects of a system, and it is often seen as preferable in the early phases of the adoption of a new system. Effort is expected in terms of money and time. Extra work is often associated with learning how to use and manage a system or technology rather than with the use itself, according to Zhang, D. in the journal Input Substitution, Productivity Performance and Farm Size in 2016. Another highly anticipated driving factor is uncertainty financial expenses, which may be due to technical changes, e.g.

According to the 2021 Census of Agriculture; Citeseer: Philadelphia, the perceived effort to adapt a new system or technology increases with one's work experience, given that the time required for the learning process is longer for those just starting out in the agricultural industry. Due to economies of scale, productivity gaps, market prices for inputs, and transaction costs for evaluating and purchasing new technologies, small farms tend to lag behind larger farms. As a result, the relationship between expected effort and behavioral intent was considered moderate according to farm size.

2.3.3 SOCIAL INFLUENCE

Social influence is determined by influential individuals, such as friends, co-workers, and family members, who persuade a person to utilise a system or technology. Relationships of age and seniority with career factors of engineers and scientists, according to Mansfield, R. In 1975's J. Applied Psychol, societal stress resulting from the media or politics is also discussed. Examining the social impact of coworkers, friends, and family on strategic farm choices reveals the significance of social influence to company growth, sustainable agriculture, and conservation practises, among others.

The social context, such as friends and family, impacts the growth of agricultural enterprises to some extent. agues with new technology had a considerable impact onIn addition, it was discovered that the experience of

farmers' colle farmers' future usage. Moreover, family members have a considerable impact on strategic farm development choices. Research indicates that in an organisational setting, experienced individuals are more inclined to adhere to the majority view.

According to Bahner, T. in the journal Agricultural company design according to personal goals in 2016, inexperienced users of technology tend to follow the opinions of others and use technology to receive positive feedback from influential peers, even if they have a negative reaction to the technology themselves. Therefore, social impact may be tempered by job experience and farm size.

2.3.4 FACILITATING CONDITION

The enables condition describes the degree to which respondents feel that the farm has organisational and technological infrastructure that makes it easier to operate the system. Operational requirements that enable the usage of smart goods in the first place are part of the building of such favourable circumstances. According to Davis, F.D.'s Consumer Acceptance of Information Technology: Towards Unity, published in 2017, conducive conditions influenced behavioural intents and acceptance. External sources such as fixed or fast mobile internet, as well as power network capacity, are all factors.

According to Karnouskos, S. in the journal Industrial automation based on cyber-physical system technologies; Prototype implementations and problems in 2016, it also encompasses general IT systems such as internal networks and specific IT systems necessary to support the system. Another consideration is how well the agricultural procedures of the organisation are matched with implementation issues and can be updated to meet new system needs.

This also involves the capacity to obtain the necessary technical skills, information, and people to put the technology into practise. Employees with more years of expertise are expected to prefer obtaining assistance and support while implementing new technologies. Furthermore, social impact may be tempered by job experience and farm size.

2.4 EFFECTIVENESS OF SMART FARMING

Incredible technical advances (2015) sparked a fresh optimism about the future. People in general were sceptical of these innovations, nevertheless. Many individuals, you see, had become used to operating a particular manner. Everyone would need to go beyond their comfort zone and try something new in order to fully take advantage of the amazing opportunities presented by modern technology. This was a scary reality for most individuals, particularly company owners, but many people made the jump since the advantages exceed the risks.

Since then, technological progress has been on the increase, and the only constant has been the frequency with which we are forced to leave our comfort zones. On the other hand, this is a positive development. Even if you're not well off, you may still enjoy the many conveniences made possible by modern technology. In this piece, we'll take a look at how technology has helped in certain ways. Here are some new technologies in Smart Farming that can provide effectiveness to Malaysian agriculture.

2.4.1 SMART FARMING INCREASE COMPANY PRODUCTIVITY

In economics, productivity refers to the amount of output produced per unit of input, such as labour, capital, or any other resource. It is often estimated as a ratio of gross domestic product (GDP) to hours spent in the economy.Workforce productivity may be broken down further by industry to look at trends in labour

growth, salary levels, and technology advancement. Productivity increase is closely related to corporate earnings and shareholder returns. Based on Neorotrakerx website in 2021, productivity is a measure of a company's production process efficiency at the corporate level. It is determined by comparing the number of units produced to employee work hours or by comparing net sales to employee labour hours. Productivity is the most important factor in determining economic development and competitiveness.

Smart farming is considered to boost production since contemporary technology has improved the speed and quality of agricultural processes. This is because, in addition to the workforce that runs the agricultural sector, there are other facilities that assist, such as contemporary technology. Technology is a tool that has an impact on people's lives today, particularly in the workplace. The usage of technology in the workplace may help employees perform better. Increased productivity and acceptability of utilising this approach to assist enhance the development of quality work products may be used to assess its efficacy. It also aids communication, improves workforce integration, boosts productivity, and improves information delivery.

2.4.2 SMART FARMING INCREASE INCOME

According to Times New (2019), incomes increase in a key way with inflation, so even though the value of capital has fallen, our incomes remain stable. Every technological advancement in this world expects to increase income in the future. For a country that wants to develop, investment for the future is not something that will be detrimental, but it is something that will give high profits to companies and at the same time increase national income. Economic Affairs Minister Datuk Seri Mohamed Azmin Ali said they would provide financial support and capital assistance for the use of Smart Farming technology in the country as they could see that agriculture was now an important sector that had contributed to Malaysia's economy and GDP. This is due to the many quality local

products that have the potential to penetrate the international market. MAHA also opens space and opportunities for small and medium entrepreneurs as well as industry players to promote and expand the business market.

Smart agriculture is considered to be able to increase yields because, as the agricultural sector becomes more sophisticated, the output of agricultural products will grow in a locked way with the speed and efficiency of today's technology. Manufacturers will benefit from advanced technology by reducing downtime, increasing productivity, and lowering the total shipping cost of excellent components. However, since the technology can operate non -stop throughout the day, output will continue to increase over time. The high wants and demands of customers will be met by continuous product manufacturing. As a result, if the firm is able to fully meet customer demand and does not stop production in response to market demand, revenue will increase. If the income in the company increases, the country's GDP will also indirectly increase.

2.4.3 REDUCE AGRICULTURE SECTOR COST

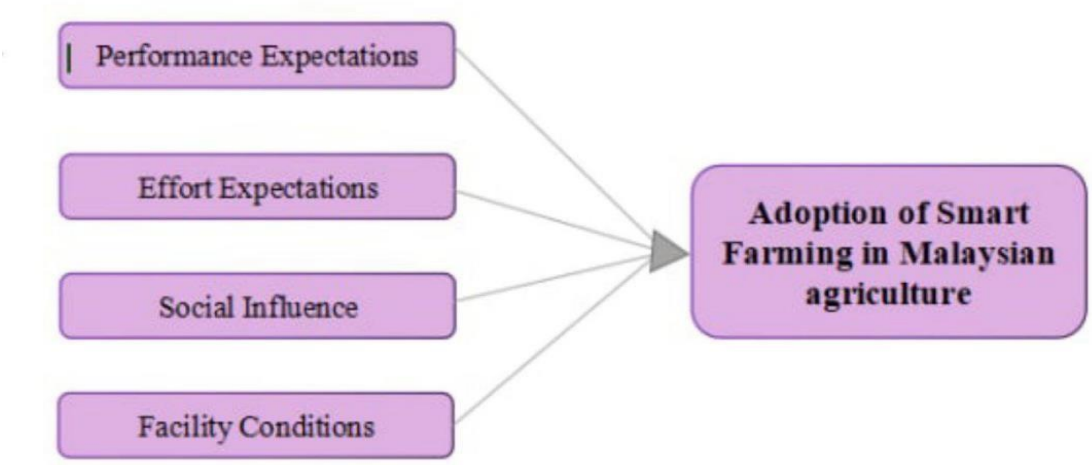
One of the criteria that determines the profit in agricultural operations is the cost of production. Apart from managerial skills and excellent Agricultural Practices, the rate of profit and loss of an agricultural firm is determined by the wisdom of a farmer or entrepreneur in regulating the cost of production. The complete product that can be sold according to the grade and price that can be achieved at the farm stage or post-harvest stage is used to quantify income or produce from farms, livestock, fisheries, and agro-based industries. Based on M.Anem in his journal early 2022, basic Development Cost, Input Material Purchase Cost, Manpower Wage Cost, Miscellaneous Cost, and Contingency Cost are all included in the production cost. After subtracting the Gross Farm Income (Gross Farm Income), which is termed the Net Farm Income, the Total Cost of Production is the total of all the foregoing expenses, with the amount determining

the gross profit (Net Farm Income). I generated some invoices for this morning's post that enable us to reduce farm production expenses and enhance earnings.

The employment of cutting-edge technology in agriculture enables businesses to employ fewer people, which is a cost savings. With today's technology, most manual labour will be replaced by robots and high-tech machinery. For instance, a big farm may have sensors set up in all of its four corners to measure the fertility of its crops without requiring any of the farm's workers to do it manually. In the same way, modern agriculture relies only on the use of fertiliser dispersed by drones piloted by a single human worker. Time savings complement the labour cost savings that may be realised in the agricultural industry. The salary expenditures may be reduced by working less hours. Animals will be phased out of agriculture as a result of the adoption of Smart Farming practises and the realisation that maximising human potential while still relying on livestock is an antiquated method.

2.5 RESEACH FRAMEWORK

Figure 2.1 Conceptual research framework of my research



2.6 HYPOTHESIS OF THE STUDY

H1: There is signifcant relationship between effectiveness of adoption smart farming in Malaysia agriculture with performance expentancy.

H2: There is signifcant relationship between effectiveness of adoption smart farming in Malaysia agriculture with effort expentancy.

.

H3: There is signifcant relationship between effectiveness of adoption smart farming in Malaysia agriculture with sosial influences.

H4: There is signifcant relationship between effectiveness of adoption smart farming in Malaysia agriculture with facilitation condition.

2.7 SUMMARY

In the long run, a well -managed Smart Farming technology system in plantations such as the sowing process implemented using brand new technologies, has the potential to contribute to the expansion and effectiveness of the country's agriculture sector. Technology -based HR operations give managers real -time metrics, which allow managers to follow and identify trends effectively and, as a result, lead to effective workforce management. This not only ensures transparency, but it also facilitates senior management to exercise greater control over plantation operations. Several challenges including internet connection have been resolved for the survival of sophisticated plantations. However, farmers need to radically adjust their perspectives on their job to accommodate this introduction of Smart Farming. It can only be implemented to be successful and effective if plantation professionals learn to become proficient with the conventional skills and knowledge of advanced technology and also acquire the capacity to apply their expertise throgh technology.

CHAPTER 3

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter will discuss the research technique that was used for the dissertation, as is suggested in the chapter's title. The author provides a more in-depth explanation of the research strategy, the research method, the research design, the methods of data collecting, the selection of the sample, the research process, and the kind of data analysis in this part of the study.

3.2 RESEARCH DESIGN

This chapter focuses on the research study methodology in order to examine the study's design, population, and data gathering and analysis techniques. It also gives information on the data gathering methods, research procedures, and data analysis techniques utilised to conduct a study consistently and rationally. (Saunders, Lewis, and Thornhill, 2016) As a method for collecting quantitative data, the questionnaire will be utilised. The purpose of this descriptive study is to evaluate and investigate measurement issues. This study's objective is to determine the factors influencing the adoption of Smart Farming and to examine the most significant factors of Smart Farming. No research is assumed or required for design, based on (Baran M. L. 2022). The method of data collection does not alter the design logic. The study design is distinct from the data collecting techniques; consequently, any research design might theoretically use any data gathering technique and incorporate both quantitative and qualitative findings. Recognizing the continuum of research goals, ranging from exploratory to confirmatory research question, is crucial to gaining a deeper understanding of research design.

3.2.1 DESCRIPTIVE RESEARCH

Descriptive studies are used to describe the characteristics of the population. These tools respond to what, when and how questions about a particular community or group. Descriptive studies, according to (McCombes, 2019), attempt to characterize a population, situation or phenomenon accurately and completely. What, where, when, and how can be explained, but not why. A descriptive study design may use multiple research approaches to investigate one or more variables. Descriptive research is a powerful tool for discovering characteristics, frequencies, trends and classifications. The researchers will use descriptive research in this study, and they will be able to survey a representative sample to determine the adoption factors of smart farming in Malaysian agriculture.

3.3 METHODOLOGICAL CHOICES

3.3.1 QUANTITATIVE RESEARCH

The two most important aspects of quantitative research are the data collection and examination phases of the procedure. It is feasible to utilise it to discover patterns and averages, analyse causal relationships, make predictions, and generalise findings to broader groups. For the purpose of this study, the approaches of quantitative research were used. Quantitative analysis is an approach that explains the connection between variables to analyse the purposes of the hypotheses, as stated by Apuke et al. (2017). This connection is used in order to arrive at findings about the hypothesis. Using mathematical processes, numerical data may be studied, and some variables, which are generally computed using equipment, are uncomplicated to compute. The finished research project is broken down into many components, including an introduction, a literature and theory review, a section on methodology, a section on results, and a section on the

discussion of those findings. Quantitative research needs the collection of data so that information may be quantified and placed through statistical processing to either support or invalidate alternative knowledge statements.

In addition, Williams (2017) mentions that the first step in doing quantitative research is the development of a problem statement, followed by the production of a hypothesis or research question, the appraisal of relevant literature, and the quantitative analysis of data. It is common practise for quantitative approaches to begin with the collecting of data, whether they are predicated on a hypothesis or a theory. After that follows the use of one of two types of statistical methods: analytical or inferential. Polls and studies are two examples of the kind of situations that are commonly used for the observational correlations method. These relationships are extremely widespread. The quantitative approach is a technique that may be put to good use for the goal of determining the nature of the connection that exists between the independent variable (IV) and the dependent variable (DV). When doing research, employing this approach has several advantages, one of which is that it makes use of statistical data as a tool, which helps save both time and resources.

According to Bryman (2018), a quantitative research strategy is a sort of study that places an emphasis on the gathering and analysing of data via the use of numerical data such as numbers and figures. This style of research is also known as "scientific research." The conduct of 22 different quantitative research methodologies has the potential to certainly have a scientific flavour. If statistical data hadn't been utilised for the study descriptions and analysis, the researcher would have needed to spend more time and effort discussing his findings. On the other hand, employing statistical data reduces the amount of time spent as well as the amount of work put in. Using a statistical software designed specifically for social science, such as SPSS, a computer is able to do calculations and research on data such as numbers, percentages, and quantifiable statistics. This is made

possible via the use of a statistical programme (Gorard, 2021, Connolly, 2017). Because of this, a large amount of time, energy, and resources may be saved.

Table 3.1 Feature of Qualitative and Quantitative Reseach

Point of comparison	*Qualitative research*	*Quantitative research*
Focus of research	Quality (nature, essence)	Quantity (how many, how much)
Philosophical roots	Phenomenology, symbolic, interaction	Empiricism, logical positivism
Associated phrases	Fieldwork, ethnographic, naturalistic, grounded, subjective	Experimental, empirical, statistical
Goal of investigation	Understanding, description, discovery, hypothesis generating	Prediction, control, confirmation, hypothesis testing
Design characteristics	Flexible, evolving, emergent	Pre-determined structure
Setting	Natural, familiar	Unfamiliar, artificial
Sample	Small, non random, theoretical	Large, random, representative
Data collection	Researcher as primary instrument, interviews, observations	Inanimate instruments (scales, tests, surveys, questionnaires, computers)
Mode of analysis	Inductive (by researcher)	Deductive (by statistical methods)
Findings	Comprehensive, holistic, expansive	Precise, narrow, reductionistic

Adapted From: Merriam (2019) and Yin (2015), Quantitative Data Analysis, available at

http://wilderdom.com/research/QualitativeVersusQuantitativeResearch.html

3.4 DATA SOURCE

According to the definition published by the Organization for Economic Co-operation and Development (2016), a data source is a specific data collection, metadata set, database, or repository from which researchers can retrieve data or information. Before information can be shown and understood, it must be collected and categorised. All previously obtained and stored information or knowledge is considered data. Cost, time, and other resources available to a researcher may vary significantly based on the data collection method employed. Researchers may use secondary sources to obtain information on situations, events, or groups of people (Kumar, 2010).

3.4.1 PRIMARY DATA RESOURCES

The research by Puvenesvary, Radziah, and Sivabala (Murgan, 2015) classified primary data as information obtained for the first time, such as an interview or a survey. This study uses a questionnaire to obtain early data. A questionnaire's objective is to collect thorough personal data on the participants taking part in the research (Mathers, Fox, & Hunn, 2019). An interviewer administers self-administered surveys, which are completed by the target respondents. Questionnaires may be used to reach a huge number of individuals. Kishore P. defines primary datasets as those acquired by researchers (2022). Researchers and academics gain this information for their studies through analysing data collected by government organisations, business institutions with a research emphasis, and independent field investigators. Researchers may obtain primary data in a number of methods. Typical approaches include self-administered surveys and interviews, field observation, and experiments..

3.4.2 SECONDARY DATA RESOURCES

According to Sparrow's study (as stated in Rengasamy, 2017), the researcher does not collect secondary data; rather, someone else does. Secondary data categories include journals, periodicals, reference books, and directories. According to Prescott's research (cited in Rengasamy, 2017), secondary data is the most often used approach. Secondary data is less expensive, more convenient, and provides more useful information for study than original data (Johnston, 2016). As a result, secondary data is used in the research to have a better understanding. This allows time for the framing of questions and the acquisition of a thorough understanding of the issues being addressed before moving on to the more time-consuming and resource-intensive process of collecting primary data. Articles and journals authored by other researchers are reviewed for the aim of this study in

order to have a better understanding of the subject matter and past research on the issue.

3.5 LOCATION OF RESEARCH

The place that the researcher will conduct or choose for this study is critical to the success of this study. The researcher will conduct this study in Malacca, Malaysia. Target. The population of this study will show the effectiveness of the application of modern Smart Farming technology in the Malaysian agriculture sector.

3.6 SAMPLING DESIGN

Stephen Roecker, Tom D'Avello, 2020. Because this study cannot monitor the majority of individuals concurrently, samples are collected to have a better understanding of the community. It is vital to acquire samples that are representative of the whole population as a starting point. Sample design is crucial to any study because it effects both the data collected by researchers and their conclusions. A sample design is a method for selecting a subset of a larger population that is representative of the whole. Refers to the method used by the researcher to pick items for the sample. Using sampling design, the researcher may choose sampling techniques, sample sizes, locations, and time periods.

3.6.1 TARGET POPULATION

A target population is a collection of individuals, events, or intriguing items from whom researchers want to draw conclusions. The approach begins by targeting the proper demographic. This research will thus concentrate on the demographic of contemporary farmers in Malacca, Malaysia. According to Banerjee and Chaudhury, researchers have identified the target population as the selection of participants or sample units for future studies (2016). In this study, we will investigate the efficacy of this Smart Farming technology among farmers.

Therefore, our target group for this research is comprised of both novice and experienced farmers from the industrial sector of Malacca, Malaysia.

3.6.2 SAMPLING TECHNIQUE

The researcher should utilise the sampling approach to choose the group of study participants. The researcher must first choose a sample before selecting a group of people. A group of people who took part in the research as responders was referred to as the sample. The sampling technique has four steps that can be applied. The first is that the researcher will choose the group of people or research subjects among the target demographic.

The sample frame is the second. The actual list of people that were sampled, representing the whole target population, is known as the sampling frame. It includes a list of every component that can influence the population. In this study, Malacca agricultural workers were chosen as a sample by the researcher. The next step is to describe the sampling method. There are different probabilities, such as random selection or non-probability, where the process is not random. Random selection can be used to choose the sample if the sampling frame closely resembles the researcher's chosen target population. However, the researcher can make a non-random selection that can at least paint a picture of the people in the immediate area if the sampling framework is not representative of the target population. To select a random sample for this study, the researchers followed a straightforward random sampling approach.

Choosing the sample size is the third step. The sample size is the number of units included in a sample. When calculating this sample size, the researcher will take into account a number of factors, including time, cost, and even the facilities used. Larger sample sizes are generally advantageous, but they demand a significant time and financial commitment. Since the focus of the study is on the agriculture industry in Malacca, Malaysia, it would be impractical for the

researcher to apply Krejcie and Morgan's (2016) method, which includes a table that determines the number of samples that may be collected depending on the population as a whole. The Cochran calculation approach, which required the researcher to utilise a formula to determine how many samples she could gather, was used to establish the sample size for this study. A sample size at a 95% confidence level and a significance level of 5% were needed by the researchers. The researcher will employ the following formula.

The size of the population refers to the total number of people from whom the researcher has the option of selecting individuals to take part in the survey. This is the total number of people who participated in the survey and will assist researchers in analysing the data. The researcher's population and the margin of error in the survey both have a role in determining the total number of people who make up the sample size. This will provide the total number of respondents for whom the researcher is required to complete the questionnaire in order to collect comprehensive information and results.

Cochran's Formula for sample size.

Figure 3.1 Confidence Level and Level of Significance table.

$$n_0 = \frac{Z^2 q}{e^2}$$

$$n = \frac{z^2 q}{e^2} = \frac{(1.95)^2(0.5)}{(0.5)^2} = 384 \cdot 16 = 385$$

Confidence Level	α (level of significance)	$Z_{\alpha/2}$
99%	1%	2.575
95%	5%	1.96
90%	10%	1.645

3.6.3 SAMPLING SIZE

In market research, the sample size is the number of individuals included in a sample. We define a sample size as a subset of the general population that is representative of the target population for the purposes of a given study. Often, this number is represented by the symbol n. It is crucial to remember that sample size has a direct effect on two statistical properties: accuracy and the capacity to draw conclusions from the study. The first stage in choosing sample size is for the researcher to determine the characteristics of the target population and the required level of precision. The researcher must determine the size of the population, the margin of error, the level of confidence, and the standard deviation. As determined by the general population, the overall sample size for the study is 150 participants.

3.7 RESEARCH STRATEGY

Despite the fact that the research for this dissertation was applied, it was not unique research. Rather, there have been a great number of studies published in academic publications in the past that explore the role of information technology (IT) in developing and managing human resource management, not only for workers in general but also for firms' internal organisations. As a result, the intended research took on the appearance of a new investigation, despite the fact that it was done on a previously examined issue.

A research strategy is a specific plan of action that gives direction to researcher ideas and efforts. It enables research to be carried out methodically and on schedule, producing high-quality findings and thorough reporting. A research plan is another name for a research approach. This makes it easier to maintain focus, reduce frustration, enhance the calibre of the task, and, most significantly, conserve time and money. The research strategy should outline the objectives of the study as well as the experiments that will be conducted to produce the desired results. Research strategy, as defined by Saunders et al. (2009), is the overall plan for how the researcher will approach addressing

the research questions. Similar to this, Bryman (2018) described research strategy as a general approach to the conduct of research. The research strategy, according to Remenyi and colleagues (2015), sets the overall course that the research will take as well as the methods that will be applied to conduct the research.

3.7.1 QUESTIONNAIRE DESIGN

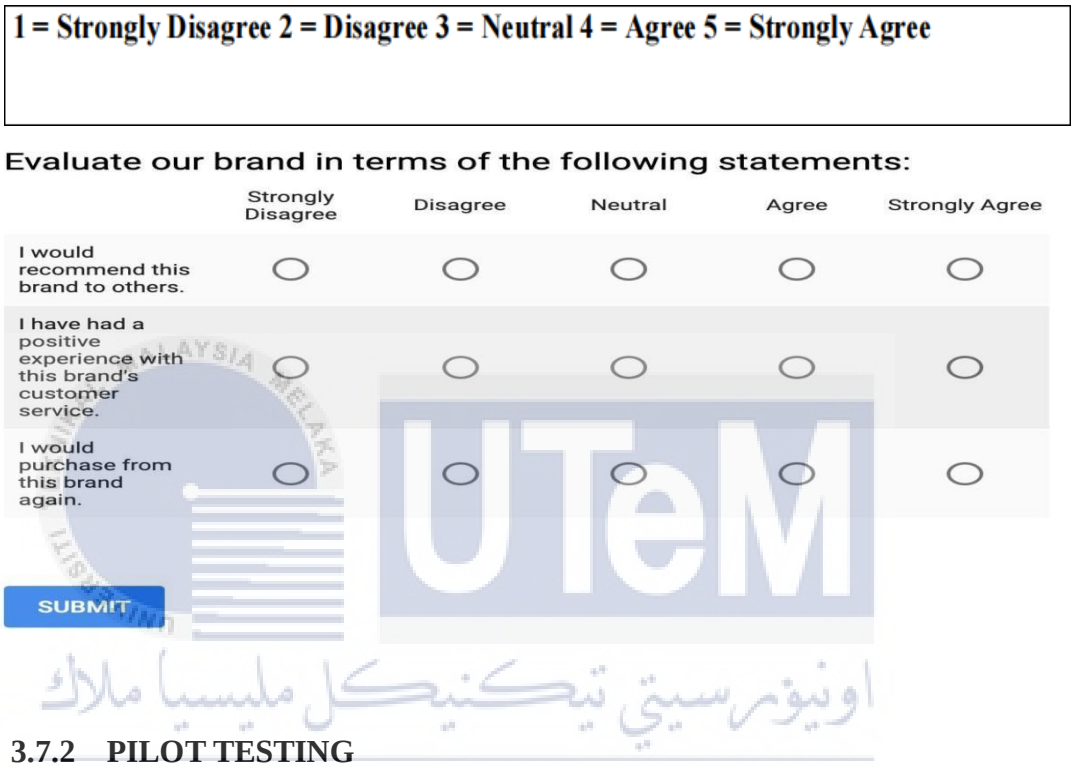
One of the approaches used was a semi-structured questionnaire, which acted as an interview guide for the researcher and was used as part of the research process. The researcher went into the interview with a list of predefined questions in order to steer the conversation toward the study's objectives.

Within the scope of this investigation, the questionnaire can be divided into three different parts: Part A, and part B. Part A of the questionnaire includes questions related to demographic and geographic background information, while the next part is questionnaire including answers. This particular segment, for example, in this section questions the respondent's gender, age, level of education, the type of enterprise they run and their total income. The researcher will then develop a questionnaire for parts B of the study. This questionnaire will include questions about the independent variables of the research, which include performance expectancy, effort expectancy, social influence and facilitation condition. Part B of the study will then be conducted. The part focuses on the discussion about the adoption of smart farming.

The use of a questionnaire is a common method that a researcher will employ because it is an easy way to get information about the research that the researcher is interested in studying. This questionnaire will have a total of 30 questions, with each part having six questions; the type of measurement that should be used to evaluate it is a Likert Scale, and it will be presented in the following format: With the help of the Likert Scale, a person's level of agreement or disagreement with a particular assertion can be measured on a scale that ranges

from 0 to 10. In order to respond to each question on the Google form, the following scale is utilised:

Figure 3.2 Likert Scale at google form.



3.7.2 PILOT TESTING

The pilot test's primary objective is to determine whether or not the survey, particular piece of information contained inside a questionnaire, or observation form will be easily comprehended by the respondents. In order for researchers to determine whether or not a question should be included in their survey, that question must first be sent out to a select group of professionals or persons who have knowledge in a field related to their investigation. The primary objective of the pilot test is to establish whether or not all participants comprehend the investigator's questions in the same manner. This gives the researcher the opportunity to identify any issues with their questionnaire and make the necessary adjustments before distributing it to the remaining participants in the study.

The researcher involved in this study made the decision to test the reliability of the questions using a total of thirty different respondents. With the results of this test, the researcher would have a greater sense of assurance that there is an issue with the questionnaires and that, without a shadow of a doubt, respondents will react. Researchers have a responsibility to ensure that respondents not only comprehend the questions being asked but also comprehend them in the same manner.

3.7.3 TIME HORIZONTAL

A time horizon is a collection of numerical data collected at fixed time intervals over a period of time. This time period may be displayed annually, monthly, weekly or frequently. The time frame for this analysis is to make research progress in analyzing the effectiveness of the use of Smart farming technology in the agriculture sector. From March 2022 to June 2022, researchers have four months to complete this investigation, and all progress has been recorded in a Gantt Chart that summarizes research activities. Researchers took four months to complete the report, including collecting and evaluating data as well as obtaining report findings.

3.8 DATA ANALYSIS METHOD

Data analysis is the process of cleaning, modifying, and modelling data to acquire information that may be used to make decisions on research. In addition, the researchers want to use the knowledge gleaned from this data analysis in their study. According to Jake Frankenfield, analytical or logical patterns, correlations, and trends are employed to assess data (2021). As an added advantage, survey data may be utilised to assist researchers in summarising their results. This research will use descriptive analysis, multiple regression analysis, Pearson correlation analysis, and reliability analysis.

3.8.1 DESCRIPTIVE ANALYSIS

Data analysis includes descriptive analysis, often known as statistical analysis. In this research, a dashboard is utilised to display what has previously occured. A data set or sample is exposed to statistical analysis in order to collect, examine, interpret, and show data. One of the three types of descriptive statistics, statistical distribution deals with the frequency of a particular value. The central tendency focuses on the average value, including the mode, median, and mean. While analysing the distribution of values, the variability of the data is addressed. Aside from this, recall that the range, standard deviation, and variance inform researchers about unique aspects of how the response's values are communicated (Pritha Bhandari, 2020).

3.8.2 MULTIPLE REGRESSION ANALYSIS

Multiple linear regression analysis will be used to evaluate the link between variables about the direction of correlation, the extent of the inquiry, and the strength of the association. If the slope of a dependent variable is negative, a negative r value is used to assess the relationship between actual and projected values. All the data will be used to examine the impact of different independent variables on the predictability of the dependent variable.

3.8.3 PEARSON CORRELATION ANALYSIS

The correlation analysis approach is used to measure the linear relationship between two variables. This correlation will demonstrate if the independent and dependent variables have an effect on one another. This Pearson correlation analysis will be used to determine the validity of the connection data. The correlation coefficient, often known as r or R, measures the strength of the

relationship between two populations. It will provide numerous results, ranging from a random 0 to a perfect one linear link and a perfect -1 negative relationship, which are all expressed as the square of each other. If R Square is close to zero, the difference in the best-fit line is more substantial. If R Squared is close to 1, the data is well-fitting.

Table 3.2 Correlation Coefficient

COEFFICIENT RANGE	STRENGTH
+ 0.91 to + 1.00	Very Strong
+ 0.71 to + 0.90	High
+ 0.41 to + 0.70	Moderate
+ 0.21 to + 0.40	Small but definite relationship
+ 0.00 to + 0.20	Slight, almost negligible

3.8.4 RELIABILITY

The dependability of a measure, according to Sekaran and Bougie (2016), is an indicator of the instrument's stability and consistency in assessing ideas, and it aids in determining the measure's efficacy. Furthermore, whether or not a metric is valuable is determined in part by its dependability. a statistic for measuring the amount of internal consistency that measures dependability (Zikmund, 2017). The internal consistency of measurements shows how elements in the measuring instrument used to evaluate the notion are comparable.

The degree to which items in the measure that taps the idea are similar to one another is measured by internal consistency of measures. When different techniques of data gathering provide findings that are compatible with one another, when similar observations are obtained, or when other researchers are able to infer the same general meaning, the conclusion and results are considered to be trustworthy. If, on the other hand, a researcher repeated a previous study design on a different day and got the same result, that result would be considered reliable. Several examples were explored in this study in order to get results that might be generalised to different contexts and so ensure the research findings' trustworthiness.

3.8.5 INTERNAL VALIDITY

The search for a reliable cause-and-effect relationship between a treatment and a result is an example of what "internal validity" entails. In other words, another part of what is referred to as "internal validity" is a sample's ability to rule out alternative hypotheses for a result. The idea of internal validity, according to Sekaran and Bougie (2016), aids researchers in determining the degree to which the study design allows them to make the conclusion that the independent variable causes a difference in the dependent variable. When a researcher's observed results reflect the reality of the study's findings and how those findings apply to patients with the same disease but seen in a different environment, this is known as internal validity.

The focus of this study must be kept within the constraints of the research question, research subject, and research objective to ensure the internal validity of the investigation. The importance of this study lies in the adoption of smart farming in a Malaysian agricultural company, as well as the effects of this practice. As a result, if one wants to obtain excellent results, sticking to the research question and research objective is critical.

3.9 SUMMARY

Beginning with an overview, this section goes on to describe in full the methodology used during the course of this investigation. The choices made about the study's methodology will be discussed in this chapter. Primary and secondary data sources will be discussed in subsequent chapters. To complete this study, we will rely on secondary data collected by others. The study's methodology and the researchers' physical location are both covered in this section. In this talk, we'll talk about reliability and internal validity.

In conclusion, research design and strategy are critical since they can ensure the success of this study. Qualitative data is also used in this study, with researchers choosing distribute questionnaires methods and secondary data to collect data or resources for their studies. Furthermore, one of the distinctive characteristics of descriptive research is the ability to analyse both quantitative and qualitative research methodologies. As a result, while performing descriptive research, researchers might employ a range of strategies to improve the study process

CHAPTER 4

4.0 DATA ANALYSIS AND FINDING

4.1 INTRODUCTION

This chapter will present the data and discussion of the findings of this study. This is because the researcher wants to know the effectiveness of Smart Agriculture in the Malaysian Agricultural Sector. This research was conducted around the city of Malacca since Malacca is one of the states that practices smart farming (Smart Farming) in its agricultural sector. This study will also focus on the objective of the study which is the extent to which the use of Smart Farming is implemented in the Malacca agriculture sector.

Data was collected over a period of one and a half months. For this study, the researcher distributed a questionnaire through google form to get 180 respondents to collect data and 30 respondents for the pilot test. The total sample size chosen by the researcher is based on the Krejcie & Morgan table. The questionnaire conducted by the researcher has 3 parts, namely part A for the demographic part, part B for the dependent variable and part C, D, E, F for the independent variable. The collected data will be analyzed using Statistical Package for Scientific Social (SPSS) version 27, SPSS is one of the comprehensive systems for analyzing data to collect charts, scheduled reports and trend distribution pots, descriptive statistics and complex statistical analysis.

The analysis is divided into two evaluations, each of which is linked to the study goals. The initial evaluation emphasises descriptive statistics such as frequency, "Cronbach's alpha," mean value, and standard deviations. The second evaluation focuses on the "mean score" as a signal of probable danger.

4.2 PILOT TEST

The pilot test is the first process that need be done before questionnaire will distribute to the respondents. This isi because researcer needs to ensure question is can be understood by respondens. However, for making pilot test rsearcher just choose 30 respondent that has experience and expertise at agriculture department. Do the questionnaire available with real situation that happen at that company. In the current investigation, Cronbach's Alpha was used to assess the validity of the dataset for each variable as well as the internal consistency of the variables themselves. The main content of this study is the adoption of Smart Farming in Malaysian agriculture, performance expectations, effort expectations, social influence, and facility conditions. Preliminary test findings are detailed in the table below. The table shows the results of the pilot test.

Table 4.1 Reability Statistic Pilot Test of 30 Respondents

Reliability Statistics	
Cronbach's Alpha	N of Items
.958	26

Source: SPSS Output

According to Hair et al. (2017), a Cronbach's Alpha value between 0.60 and 0.80 is considered to be acceptable, whilst a number that is greater than 0.80 is considered to be excellent. According to Hair et al. (2017), a Cronbach's Alpha value of 0.958 for 26 items with this value indicates that the value exceeds the minimal rate and is a very good value for the pilot test. This value can be found in Table 4.1.

Table 4.2 Result of Pilot Test

Variable	No of Item	Cronbach's Alpha	Validity
Adoption of Smart Farming in Malaysian agriculture	6	0.082	Valid
Performance expectations	5	0.904	Valid
Effort expectations	5	0.904	Valid
Social influence	6	0.901	Valid
Facility conditions	4	0.081	Valid
Overall	**26**	**0.958**	**Valid**

Following Social influence with a value of 0.901, Adoption of Smart Farming in Malaysian agriculture with a value of 0.802, and Facility conditions with a value of 0.801, the highest Cronbach's Alpha value in the independent variable is Performance expectations and Effort expectations with 0.904. The Facility conditions variable has the lowest alpha value of all the data that has been used with SPSS. According to Hair et al., the fact that the alpha value is higher than 0.80 demonstrates that the internal reliability coefficient of the independent variable satisfies the criteria for being exceptional (2017). As a result, the findings produced provide conclusive evidence that the measurements acquired for each variable can be trusted and relied upon.

4.3 RESPONDENT RATE

The total number of correct responses that must be gathered is 150. The questionnaire is disseminated via Google Forms, and a total of one hundred fifty answers have been gathered thus far. For the purpose of ensuring that responders did not overlook any questions before submitting the Google Form, all of the questions have been marked as "*Required" in Google Forms, and all must be answered. There is not a single instance of a mistake that can be found on any of the forms that have been disseminated. Therefore, if the respondents who completed the questions for the pilot test are included in, the questionnaire that has been entirely answered by the respondents has a total of 180 responses. which, as a whole, garnered a response rate of one hundred percent of the total replies gathered. The response rate will be shown and summarised in the following table, which is based on all of the data obtained using Google Forms.

Table 4.3 Rate of Responses that Completed and Incomplete

	Number of Responses	**Percentage (%)**
Total Responses that Completed	180	100
Total	**180**	**100**

4.4 DESCRIPTIVE STATISTIC ANALYSIS

The purpose of descriptive statistical analysis is to provide basic information obtained from this study in a format that is easier to understand (Trochim, 2020). As a result, this section presents the demographic data of the respondents who answered the questionnaire. In addition, this section presents the experience of respondents in the agriculture sector.

4.4.1 Demographic Profile

Any study's methodology must consider the respondent's background. This is due to the potential for each responder to provide valuable research. Due to the use of smart agriculture in the city under investigation, 150 respondents in this survey identify as contemporary farmers.

In this section of discriptive analysis called demographic analysis, frequency analysis is applied to the raw data to testing the demographic

information of the respondents. The profile of respondent's personal information was about gander, age, race, education level and estimate work experience.

Table 4.4 Demographic Profile of Respondents

Variable	Description	Number	Percentage (%)
Gender	Male	86	57.3
	Female	64	42.7
Age	20-24	85	56.7
	25-30	34	22.7
	31-40	23	15.3
	49 and above	8	5.3
Race	Malay	99	66.0
	Chinese	10	6.7
	Indian	9	6.0
	Other	32	21.3
Level of education	SPM	48	32.0
	Diploma	36	24.0
	Degree	55	36.7
	Master	7	4.7
	phD	1	0.7
	Other	3	2.0
Work Experience	Less than 1 year	30	20.0
	1 year to 2 years	58	38.7
	3 years to 5 years	39	26.0
	More than 5 year	23	15.3

4.4.2 Gender

Table 4.5 Gender

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	86	57.3	57.3	57.3
	Female	64	42.7	42.7	100.0
	Total	150	100.0	100.0	

Figure 4.1 Gender

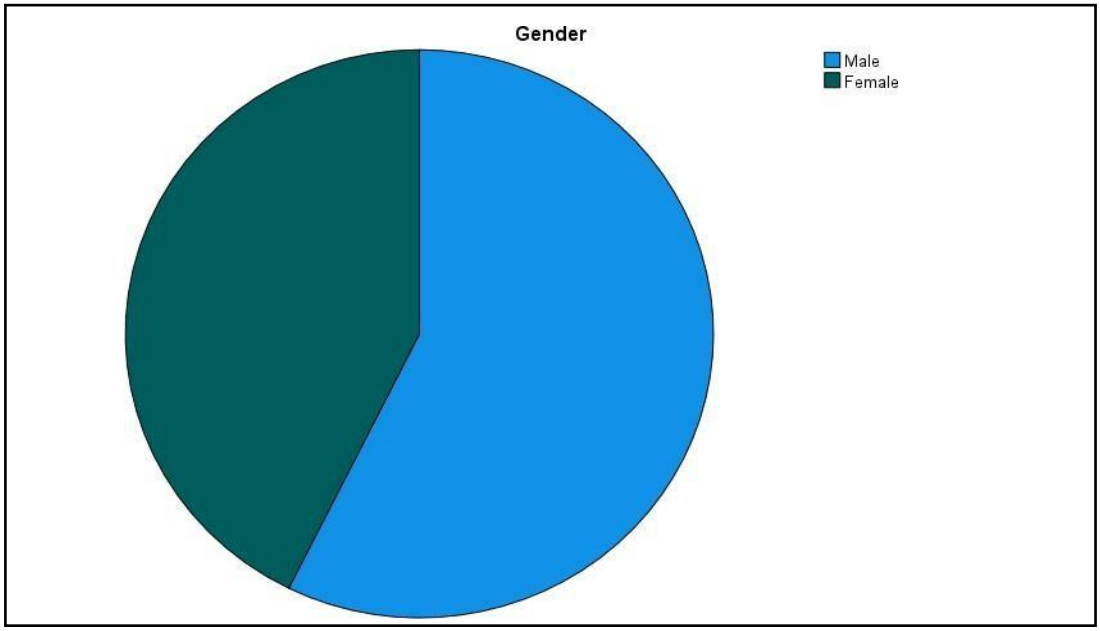


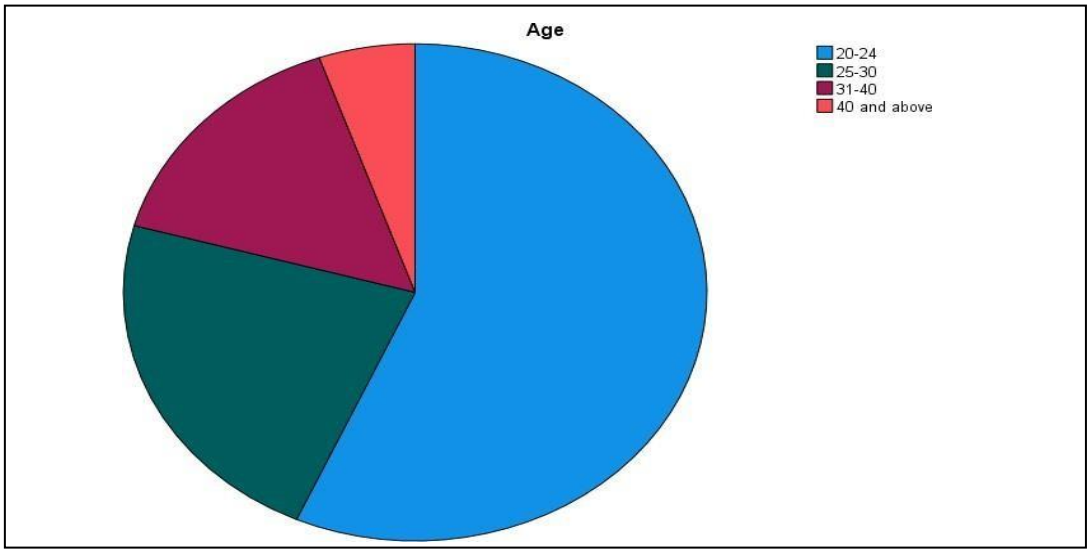
Table 4.5 and figure 4.1 shows that the percentage of respondent's gender where the data has been collected. Based on the pic chart given, 57.3% of respondents are male while female are 42.7%. So, it shows that that the total of male respondent who answered the questionnaires is 86 while female is 64.

4.4.3 Age

Table 4.7 Age

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-24	85	56.7	56.7	56.7
	25-30	34	22.7	22.7	79.3
	31-40	23	15.3	15.3	94.7
	40 and above	8	5.3	5.3	100.0
	Total	150	100.0	100.0	

Figure 4.2 Age



Age distribution of respondents who participated in this study is shown in table 4.7 and figure 4.2. The results indicate that 85 (56.7%) of respondents are between the ages of 20 to 24, while 34 (22.7%) are between the ages of 25 to 30. Then, 23 (15.3%) respondents are between the ages of 31 to 40, followed by 8 (5.3%) respondents aged 40 and abover.

4.4.4 RACE

Table 4.9 Race

Race					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malay	99	66.0	66.0	66.0
	Chinese	10	6.7	6.7	72.7
	Indian	9	6.0	6.0	78.7
	Other	32	21.3	21.3	100.0
	Total	150	100.0	100.0	

Figure 4.3 Race

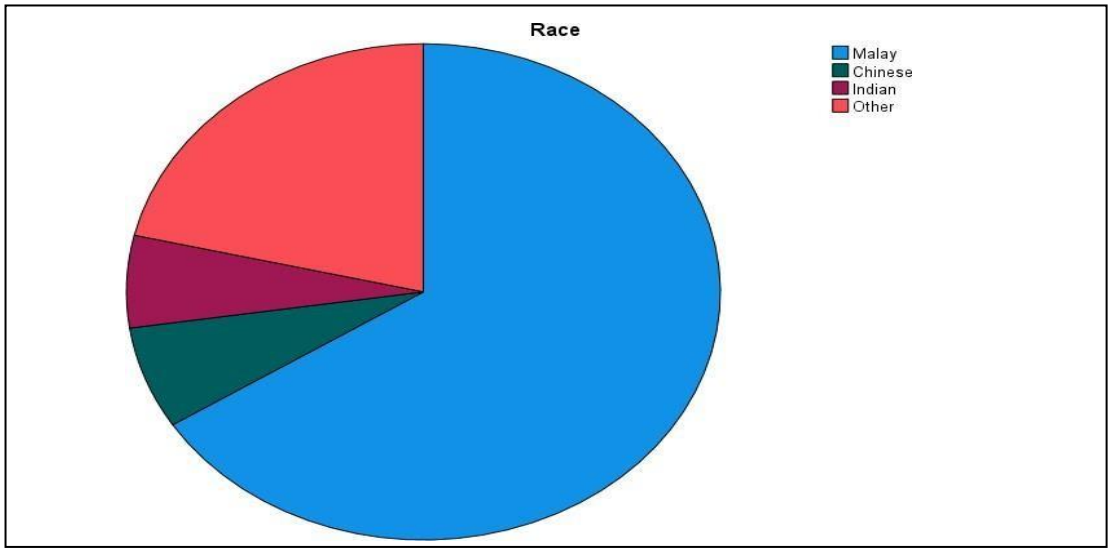


Table 4.9 and figure 4.3 show the fequency and percentage of respondent's race who are answering this questionnaires. The total of respondents who are participated in this survay is 150 (100%). The majority percentage of respondent's race who participated in this survay is come from Malay which is 99 respondents (66%) and followed by other 32 (21.3%)

4.4.5 Level of Education

Table 4.10 Level of Education

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SPM	48	32.0	32.0	32.0
	Diploma	36	24.0	24.0	56.0
	Degree	55	36.7	36.7	92.7
	Master	7	4.7	4.7	97.3
	phD	1	.7	.7	98.0
	Other	3	2.0	2.0	100.0
	Total	150	100.0	100.0	

Table 4.4 Level of Education

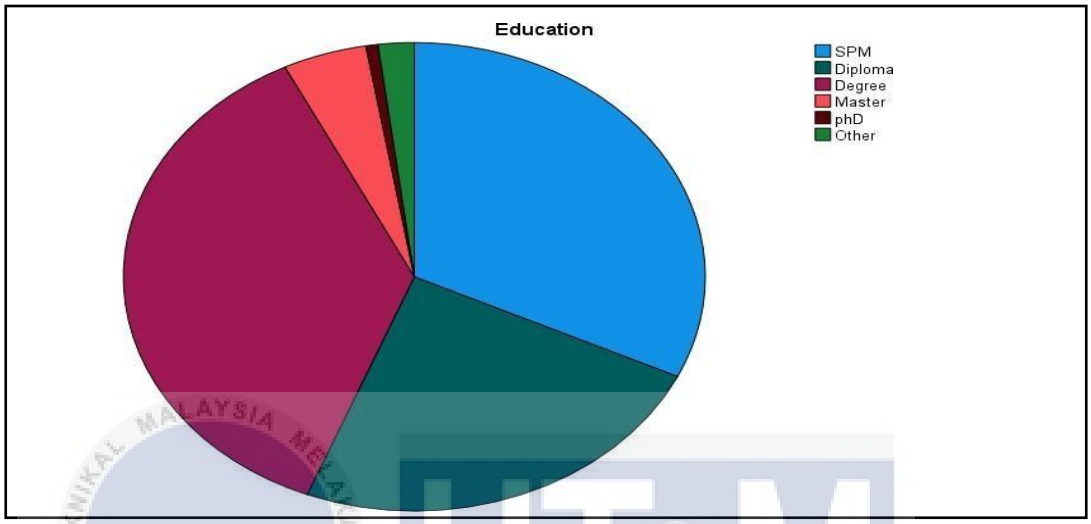


Table 4.10 and figure 4.4 show the percentage of respondent's educational level of modern farmers found around Malacca agriculture. The high percentage of education level of the respondents is degree which is 55 (36.7%) respondent's followed by SPM which is 48 (32%) respondent's. The lowest respondent who participated in this survey is phD which is only 1 (0.7%) respondent.

4.4.6 Work Experience

Table 4.11 Work Experience

Estimated Work Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	30	20.0	20.0	20.0
	1 year to 2 year	58	38.7	38.7	58.7
	3 years to 5 year	39	26.0	26.0	84.7
	More than 5 year	23	15.3	15.3	100.0
	Total	150	100.0	100.0	

gure 4.5 Work Experience

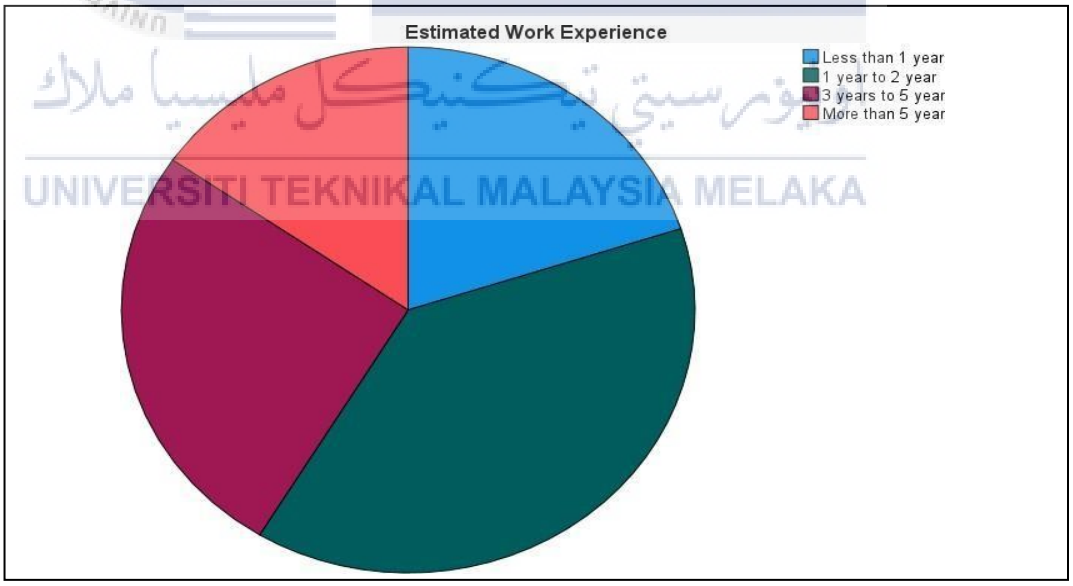


Table 4.11 and figure 4.5 shows the percentage of work experience among modern farmers in Malacca. The high percentage of work experiences are among 1 year to 2 years which is 58 (38.7%) respondents followed by 3 to 5 years which

is 39 (26%) respondents. The lowest respondent who participated in this survey is more than 5 years which is 23 (15.3%) respondents. It is conceivable to reach the conclusion that the majority of responders come from the worker demographic.

4.5 RELIABILITY ANALYSIS

Cronbach's alpha may be used as one approach for determining how consistent something is. A measurement is said to have a high degree of reliability, according to Drs. Sandhya Jain and Vijeta Angural (2017), if it consistently produces the same results. When evaluating the research's validity, Cronbach's Alpha was used to measure the overall performance dependability.

Cronbach's Alpha is a technique for assessing test reliability that requires just one test administration to get a unique estimate of the reliability coefficients one would obtain for all possible item combinations. Cronbach's Alpha is used because it is easier to implement than other estimate techniques. Cronbach's Alpha focuses only on the dependability index. For the sake of this study, reliability is a way for establishing whether or not the survey results collected are reliable. Less than 0.50 is considered unreliable, whereas 0.70 to 0.80 is good, and more than 0.80 is outstanding. Table 4.12 illustrates the relationship between Cronbach's Alpha and Internal Consistency.

Table 4.12 Cronbach's Alpha Score & Level of Reliability

Cronbach's Alpha Score	Level of Reliability
S 0.0 − 0.20	Less Reliable
> 0.20 − 0.40	Rather Reliable
> 0.4 − 0.60	Quite Reliable
> 0.60 − 0.80	Reliable
> 0.80 − 1.00	Very Reliable

Sources: Atina Ahdika (2017). Cronbach's Alpha Level of Reliability

4.5.1 Scale: Dependent Variable (DV)

Table 4.13 Reliability of Research (150 respondents)

Dependent Variable	Cronbach's Alpha
Adoption of smart farming in Malaysia agriculture.	**0.879**

4.5.2 Scale: Independence Variable

Table 4.14 Reliability of Research (150 respondents)

Independence Variable	Cronbach's Alpha
Performance expectancy	0.888
Effort Expectancy	0.876
Sosial Influence	0.915
Faciliting Condition	0.794

The reliability test outcomes are described as follows;

The range of Cronbach's Alpha reliability coefficient is commonly 0 to 1. However, there is no theoretical upper limit for the coefficient. The reliability test was successful in achieving the research reliability, according to Cronbach's Alpha reliability coefficients for one dependent variable and four independent variables, which range from 0.794 to 0.915. More than 0.70 is the consequence. Research might be carried out as a consequence. Cronbach's Alpha scores between 0.70 and 0.80 and 0.80 and 0.90 are considered to be outstanding, according to Bachir Achour (2017).

4.6 DESCRIPTIVE ANALYSIS

It is in accordance with a questionnaire that was presented to 150 contemporary farmers located near Malacca agricultural. The attitudes of contemporary farmers about the new technology that is now accessible in the agricultural industry and how successful it is are evaluated using a "likert scale" that ranges from "1" for "Strongly Disagree" to "5" for "Strongly Agree." In order to determine the degree to which Smart Farming is successful, it is necessary to place emphasis on all of the aspects that have been investigated.

4.6.1 Analysis Assessment of Descriptive Analysis

By explaining the connections between variables in a sample or population, descriptive statistics are used to organise data summaries.Typically, descriptive statistics must be calculated prior to developing inferential statistical analyses (Vikas Yellapu, 2018). The distribution of the sample has been examined using a descriptive analysis test, and now it's time to choose the other analysis kinds.

4.6.1.1 Adoption of Smart Farming in Agriculture Malaysia

Table 4.15 Adoption of Smart Farming in Agriculture Malaysia

A	Adoption of Smart Farming in Agriculture Malaysia	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	IR 4.0 is the trigger for Smart Farming technology in Malaysian agriculture.	0	2.8	20.6	33.3	43.3
2	Spraying fertilisers, pruning trees, and regulating plant quality are no longer performed by humans	3.3	10.6	21.1	27.2	37.8
3	The automotion process of agricultural and farming reduced human interaction but improve the efficiency.	0.6	4.4	15.6	35	44.4

4	By using technology, farmers can manage soil condition more effectively and at less expense by monitoring them from any location	0	1.1	12.8	39.4	46.7
5	Traditional ways of managing livestock, like spotting cows, are not fully automated and have many inefficiencies, such as more human interaction, more work, more power use, and more water use.	0.6	3.9	15	36.7	43.9
6	Smart Farming cannot work without an internet network	2.2	3.3	21.7	30	42.8

Based on table 4.15, there are six item descriptions in term of adoption of smart farming in agriculture Malaysia. For the first, 43.3% strongly agree that IR 4.0 is the trigger for Smart Farming technology in Malaysian agriculture, 37.8% respondents strongly agree the spraying fertilisers, pruning trees, and regulating plant quality are no longer performed by humans. In the meanwhile, 44.4% respondents strongly agree with the opinion that the automotion process of agricultural and farming reduced human interaction but improve the efficiency. In addition, 46.7% respondents choose strongly agree with

the statement that by using technology, farmers can manage soil condition more effectively and at less expense by monitoring them . Moreover, 43.9% respondents strongly agree that the traditional ways of managing livestock, like spotting cows, are not fully automated and have many inefficiencies, such as more human interaction, more work, more power use, and more water use. Last but not least, 42.8 strongly agree that the Smart Farming cannot work without an internet network.

4.6.1.2 Performance Expectancy

Table 4.16 Performance Expectancy

B	Performance Expectancy	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	Farmers can improve work performance more efficiently by using Smart Farming.	0	1.7	9.4	45.6	43.3
2	Using Smart Farming technology for agriculture allows our country to follow global development trends	0	1.1	12.8	36.1	50
3	Smart farming will help farmers do their jobs more quickly.	0	2.2	5.6	40.6	51.7

4	Agricultural products from Smart Farming are of better quality compared to traditional agriculture.	0.6	2.8	21.1	33.9	41.7
5	Smart Farming can save time in producing production.	0	1.7	11.7	38.3	48.3

Based on table 4.16, there are 5 item descriptions in term of performance expectancy. First and foremost, 45.6% agree with the statement farmers can improve work performance more efficiently by using Smart Farming and 50% respondents choose strongly agree that using Smart Farming technology for agriculture allows our country to follow global development trend. 51.7% respondents strongly agree respectively for the statement that Smart farming will help farmers do their jobs more quickly. Meanwhile, 41.7% respondents strongly agree that agricultural products from Smart Farming are of better quality compared to traditional agriculture. Lastly, 48.3% respondents agree with the statement that Smart Farming can save time in producing production.

4.6.1.3 Effort Expectancy

Table 4.17 Effort Expectancy

C	Effort Expectancy	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	All farmers in the agricultural area must be courageous in order to attempt something new.	0.6	2.8	7.8	44.4	44.4
2	Smart Farming may help enhance your abilities.	0	3.3	7.2	44.4	45
3	Smart Farming technology is an easy thing to learn.	0	4.4	17.2	35	43.3
4	Applying Smart Farming technology in agriculture is an interesting thing for old farmers.	2.2	2.8	15.6	37.2	42.2
5	Modern innovations like smart farming may be the catalyst for the nation's development	0	2.8	9.4	39.4	48.3

Based on table 4.17, there are five item descriptions in term of effort expectancy in adoption Smart Farming in Malaysia agriculture. In the first place, agree and strongly agree have the same number of respondents which is 44.4% with the statement all farmers in the agricultural area must be courageous in order to attempt something new. However, 45% respondents strongly agree that Smart Farming may help enhance your abilities and 43.3% strongly agree with Smart Farming technology is an easy thing to learn. Meanwhile, 42.2% stongly agree that applying Smart Farming technology in agriculture is an interesting thing for old farmers.Finally, but not least 48.3% strongly agree that modern innovations like smart farming may be the catalyst for the nation's development.

4.6.1.4 Social Influence

Table 4.18 Social Influence

D	Social Influence	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	Smart Farming causes farmers to be more creative in their work.	0	3.9	11.7	39.4	45
2	The farmers will work together in learning something new	0.6	1.1.	12.2	40.6	45.6
3	Experienced workers are responsible for teaching new farmers in learning Smart Farming	0	1.1	11.1	41.1	46.7
4	To maximise the					

	impact of smart farming, all farmers must have the same goal.	0	3.9	16.7	36.1	43.3
5	Leaders are crucial in ensuring that their agricultural keep up with the current of agricultural modernisation	0.6	1.1	11.1	38.9	48.3
6	Workers must be gradually exposed to new technology so that farmers can readily comprehend it	1.1	2.2	7.8	40	48.9

Based on table 4.18, there are five item descriptions in term of social influence in adoption Smart Farming in Malaysia agriculture. First and foremost, there are 45% respondents strongly agree with the statement Smart Farming causes farmers to be more creative in their work and 45.6% strongly agree with the farmers will work together in learning something new. Moreover, 46.7% strongly agree that experienced workers are responsible for teaching new farmers in learning Smart Farming while there have 43.3% strongly agree that to maximise the impact of smart farming, all farmers must have the same goal. In the meanwhile, 48.3% respondents strongly agree that leaders are crucial in ensuring that their agricultural keep up with the current of agricultural modernisation. Lastly, 48.9% respondent strongly agree that workers must be gradually exposed to new technology so that farmers can readily comprehend it.

4.6.1.5 Facilitation Condition

Table 4.19 Facilitation Condition

E	Facilitation Condition	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	Many agricultural companies in our country have implemented Smart Farming	0	4.4	25	36.1	34.4
2	Smart Farming technology (Robot, drone, solar) can be used for a long period of time.	0	2.2	16.7	38.3	42.8
3	Smart farming needs more effort to deploy in rural areas due to the lack of a sophisticated internet infrastructure.	1.7	1.1	12.8	35	49.4
4	No internet, then no Smart Farming.	2.2	5	21.1	23.9	47.8

Based on table 4.19, there are four item descriptions in term of facilitation in adoption Smart Farming in Malaysia agriculture. First of all, 36.1% respondents agree that many agricultural companies in our country have implemented Smart Farming. Subsequenty, 42.8% respondents strongly agree that Smart Farming technology (Robot, drone, solar) can be used for a long period of time. Moreover, 49.4%

strongly agree with the statement Smart farming needs more effort to deploy in rural areas due to the lack of a sophisticated internet infrastructure. Last but not least, 47.8% respondents strongly agree with no internet, then no Smart Farming which is to emphasize that anything that modern technology need internet to work.

Table 4.20 Average of descriptive analysis for independent variable

Independent Variable	Mean	Standard Deviation
Performance Expectancy	4.319	0.6378
Effort Expectancy	4.323	0.5636
Social Influence	4.307	0.6215
Facilitation Condition	4.247	0.6431

Table 4.20 show the average of mean and standard deviation of each variable. The statistic revealed that effort Expectancy scored the highest mean value of 4.323 whereas facilitation condition scored the lowest mean value of 4.245. This mean that the majority of respondents agreed that effort Expectancy is an important role to influences adoption of Smart Framing in agriculture sector while facilitation condition on the other hand was less important for the respondents when comes to the adoption of Smart Farming. The result also revealed that the most of the variables have scored the lower values of standard deviation, which was ranging from 0.4 to 0.5 indicating that most respondents strongly agreed with the questions in general. It means that if the standard value is small, then the scores are closer to the mean and thus indicated that respondents have a quite satisfactory level towards the variables.

4.7 INFERENTIAL STATISTICS

Inferential statistics were used to characterise and draw conclusions about a population based on a random sample of data taken from the population. On the basis of the features of the researcher's sample, inferential statistics were employed to assess the likelihood of population characteristics based on their occurrence in the sample. In addition, inferential statistics assist evaluate the strength of the link between independent and dependent variables. Several forms of inferential statistics, including Pearson correlation, factor analysis, and multiple regression analysis, were utilised to test a hypothesis and make conclusions about a population in this study.

4.7.1 CORRELATION COEFFICIENT ANALYSIS

The process of determining the strength of a relationship between two variables by quantifying them in two ordinal or numerical variables is referred to as the correlation coefficient analysis and is a step in the process. In most cases, the coefficient value between (+) or (-) may be used to determine whether the value or sign should be presented (r). The value of plus one (plus 1) implies that there is a positive correlation between the two variables, which in turn suggests that they are related. Nevertheless, if the value of (r) is negative, this implies that there is no link between the two variables and a negative correlation exists between them. In addition, the number 0 represents complete and utter independence. In the process of analysis, there are three approaches that may be taken:

➢ Pearson’s product moment correlation coeffiient (PMCC)
➢ Spearman’s rank correlation coeffiient (Spearman’s rho)
➢ Kendall’s rank correlation coefient (Kendall’s tau)

There are three conceivable consequences as a result of this. In this study, the correlation coefficient used to evaluate whether the null hypothesis is accepted or rejected is Pearson's product moment

correlation coefficient (PMCC). The relationship between the independent and dependent variables is significant, as shown by the p-value. The result is considered statistically significant if the p-value is less than 0.5. However, the p-value is regarded as statistically significant if it is more than 0.05.The Pearson Correlation Coefficient will be a value in between of -1 and 1. The nearer the R value to 1, the stronger the positive relationship; the nearer the R value to -1, the stronger the negative relationship, while 0 represent no relationship:

Table 4.21 Relationship interpreted through R value (Glen, 2020)

R value	Relationship
0.70 or higher	Very Strong Positive Relationship
+0.40 to +0.69	Strong Positive Relationship
+0.30 to +0.39	Moderate Positive Relationship
+0.20 to +0.29	Weak Positive Relationship
+0.01 to +0.19	No or Negligible Relationship
0	No Relationship
-0.01 to -0.19	No or Negligible Relationship
-0.20 to -0.29	Weak Negative Relationship
-.030 to -0.39	Moderate Negative Relationship
-0.40 to -0.69	Strong Negative Relationship
-0.70 or higher	Very Strong Negative Relationship

Table 4.22 Pearson Correlation Results between Variables

Correlations						
		DV	IV1	IV2	IV3	IV4
DV	Pearson Correlation	1	.818**	.699**	.650**	.580**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	150	150	150	150	150
IV1	Pearson Correlation	.818**	1	.791**	.730**	.531**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	150	150	150	150	150
IV2	Pearson Correlation	.699**	.791**	1	.828**	.631**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	150	150	150	150	150
IV3	Pearson Correlation	.650**	.730**	.828**	1	.752**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	150	150	150	150	150
IV4	Pearson Correlation	.580**	.531**	.631**	.752**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	150	150	150	150	150
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: SPSS Output

Table 4.22 shows the Pearson Correlation results analyzed using SPSS. Based on the table above, there is a significant relationship between the variables including the dependent variable and also the independent variable because the significant output between the variables is 0.001. This is because when the p value is 0.05 and below it can be considered statistically significant (Jaadi, 2019). For independent variables including performance Expectancy, effort expectancy, social influence, and the use of smart agriculture in agriculture with dependent variables. Pearson Correlation analysis through SPSS has shown 0.580, 0.531 and 0.631 respectively. According to Table 4.22, the R value between 0.40 to 0.69 shows that there is a strong positive

relationship between the dependent and independent variables. Meanwhile, there is also an independent variable that is very strongly related to the dependent variable until it reaches 0.7 and above, which is a facilitating condition. It shows a moderate positive significant relationship according to Table 4.21 and Sig. (2-tailed) between the two variables is 0.001 as well.

4.8 RESEARCH RELIABILITY TEST

It is necessary to conduct a survey and collect feedback from a total of 160 participants including those involved in the pilot test to conduct the reliability analysis of this research. There are a total of 21 questions related to four independent variables, namely performance improvement, effort expectancy, social influence, and facilitating conditions. The implementation of smart agriculture in Malaysian agriculture is the next 6 questions, all of which are related to the dependent variable. According to Cronbach's Alpha consistency level, which is shown below, the reliability level of this study is determined as follows:

Table 4.23 Cronbach's Alpha Level Consistency

Cronbach's Alpha	Internal Consistency
$0.5 > \alpha$	Unacceptable
$0.6 > \alpha \geq 0.5$	Poor
$0.7 > \alpha \geq 0.6$	Questionable
$0.8 > \alpha \geq 0.7$	Acceptable
$0.9 > \alpha \geq 0.8$	Good
$\alpha \geq 0.9$	Excellent

The table below shows the results of Cronbach's Alpha:

Table 4.24 Reliability Statistics of 150 Respondents

Variables	Cronbach's Alpha	Number of Items
Independent Variables		
1. Performance	0.693	5
Expectancy	0.888	5
2. Effort Expectancy	0.915	6
3. Social Influence	0.794	4
4. Facilitationg Condition		
Dependent Variables		
1. Adoption of Smart Farming agriculture in agriculture	0.934	6
Overall	**0.934**	**26**

Source: SPSS Output

Table 4.25 Overall Cronbach's Alpha of 150 respondents

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	26

Source: SPSS Output

Table 4.25 above shows the reliability test results after being analyzed using SPSS. Cronbach's Alpha value achieved is considered valid when it exceeds 0.70. The reliability test for Expectancy performance has come out with a Cronbach's Alpha value of 0.693 which is in the Questionable range according to Cronbach's Alpha Level Consistency. For effort Expectancy got 0.888 from Cronbach's Alpha value which is also considered as Good. On the other hand, social influence and facilitation condition Cronbach's Alpha are 0.915 and 0.794 respectively which means that social influence is in the Excellent range while the facilitation condition is in the Acceptable range. For the dependent variable which is Adoption of Smart Farming agriculture in agriculture obtained 0.934 Cronbach's Alpha value and makes it in the Excellent range as well.

In summary, the reliability test of all variables is acceptable because almost all of them obtained more than 0.70. For the overall Reliability test, this study has obtained 0.934 which means its internal consistency is Excellent according to Cronbach's Alpha Level Consistency table as shown in Table 24. Therefore, this study can be concluded as very reliable based on this reliability test.

4.9 MULTIPLE REGRESSION ANALYSIS

In this study, we do Multiple Linear Regression in order to determine the linear link that exists between the dependent variables and the independent variables. This allows us to next perform Multiple Regression Analysis (Kenton, 2020).

Table 4.26 Multiple Linear Regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669[a]	.447	.432	2.57079
a. Predictors: (Constant), IV4, IV2, IV1, IV3				

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	775.761	4	193.940	29.345	.000[b]
	Residual	958.299	145	6.609		
	Total	1734.060	149			
a. Dependent Variable: DV						
b. Predictors: (Constant), IV4, IV2, IV1, IV3						

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.805	1.660		4.099	.000
	IV1	.548	.099	.512	5.536	.000
	IV2	.340	.094	.304	3.603	.000
	IV3	-.104	.103	-.124	-1.016	.311
	IV4	.062	.117	.050	.532	.596
a. Dependent Variable: DV						

Source: SPSS Output

The Model Summary indicates that the Coefficient for Multiple R Square is 0.447.

This had indicated that the dependent variable, which was the factor adoption of smart farming in agriculture Malaysia, was influenced by the independent variables to the extent of 44.7%. The independent variables included performance expectancy, effort expectancy, social influence, and facilitation condition. Another 55.3% (100-44.7 = 55.3%) of the factor of adoption of smart farming is likely to be impacted by additional variables that are yet yet to be discovered.

The F value comes in at 29.345, and the significance value, as calculated by the Anova Table, comes in at 0.000. When the F value is high and the significance value is low, all of the findings will be statistically significant (Glen, 2020). It is possible to draw the conclusion that there is a statistically significant relationship between the independent variables, which include performance Expectancy, effort Expectancy, social influence, and facilitation condition, and the dependent variable, adoption of Smart Farming in agriculture, due to the fact that the significance value is lower than the alpha level of 0.05.

The following shows the standard Multiple Linear Regression Equation:

$$\hat{y} = b0 + b1x1 + b2x2 + \ldots + bp\text{-}1xp\text{-}1 + bpxp$$

By implementing the equation above, the linear equation below was developed based on the Beta coefficients in Table 4.25:

Adoption of Smart Farming in Malaysia agriculture.
= 6.805 + 0.548IV1+0.340IV2+-0.104IV3+0.062IV4

The equation above had shown that the relationship between independent variables which are performance Expectancy, effort Expectancy, social influence, facilitation condition and dependent variable, adoption of Smart Farming in Malacca, Malaysia agriculture are positive.

According to the coefficient Beta, the performance expectation has a greater influence towards the adoption of Smart Farming in agriculture than any of the other independent factors. This is the case due to the fact that the value of the coefficient has an effect on the contribution that the independent variable makes to the overall equation.

4.10 HYPOTHESIS TESTING

Table 4.27 Multiple Linear Regression (Coefficient)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.805	1.660		4.099	.000
	IV1	.548	.099	.512	5.536	.000
	IV2	.340	.094	.304	3.603	.000
	IV3	-.104	.103	-.124	-1.016	.311
	IV4	.062	.117	.050	.532	.596
a. Dependent Variable: DV						

Source: SPSS Output

The p-value, also known as the significance value, can be found in Table 4.26, which is where the testing of hypotheses for this study is carried out. If the p-value is lower than 0.05, then the alternative hypothesis is rejected and the null hypothesis is accepted. On the other hand, the alternative hypothesis, known as the null hypothesis, will be dismissed when the p-value is lower than 0.05. In a nutshell,

When,

$p < 0.05$, accept alternative hypothesis.

$p > 0.05$, reject alternative hypothesis.

i) Performance expectancy: p-value= 0.000

H_0 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is not positively influence by performance expectancy.

H_1 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is positively influence by performance expectancy.

Based on the p-value of perceived usefulness in the Table 4.26, the p-value is 0.000 which means it is less than 0.05. This had shown that there is significant relationship between the performance expectancy and adoption of Smart Farming in agriculture sector. Therefore, the alternative hypothesis, H_1 is accepted while the null hypothesis (H_0) is rejected.

ii) Effort expectancy: p-value= 0.000

H_0 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is not positively influence by effort expectancy.

H_2 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is positively influence by effort expectancy.

Based on the p-value of perceived usefulness in the Table 4.26, the p-value is 0.000 which means it is less than 0.05. This had shown that there is significant relationship between the effort expectancy and adoption of Smart Farming in agriculture sector. Therefore, the alternative hypothesis, H_2 is accepted while the null hypothesis (H0) is rejected.

iii) Social Influence: p-value= 0.311

H_0 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is not positively influence by social influence.

H_3 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is positively influence by social influence.

According to the p-value of social influence in the Table 4.26, the p-value is 0.311 which means it is more than 0.05. This had indicated that there is no significance relationship between social influence and adoption of Smart Farming in agriculture sector. Since the p-value is more than 0.05, the alternative hypothesis, H_3 is rejected while the null hypothesis (H_0) is accepted.

iv) Facilitation Condition: p-value= 0.596

H_0 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is not positively influence by facilitation condition.

H_4 : Adoption of Smart Farming in Malacca, Malaysia agriculture sector is positively influence by facilitation condition.

According to the p-value of social influence in the Table 4.26, the p-value is 0.596 which means it is more than 0.05. This had indicated that there is no significance relationship between facilitation condition and adoption of Smart Farming in agriculture sector. Since the p-value is more than 0.05, the alternative hypothesis, H_4 is rejected while the null hypothesis (H_0) is accepted.

4.11 SUMMARY

SPSS Statistics 26 was used for each and every one of the analyses that were carried out for this chapter. First, a Pilot Test was carried out in order to determine whether or not the questionnaire could be trusted. Following that, this chapter studied, analysed, and ultimately came to a conclusion on the data that was gathered from the 150 respondents. In this chapter, the study performed four different forms of analysis, including descriptive statistics analysis, Pearson correlation analysis, reliability testing, and multiple regression analysis. Following the completion of the data analysis, the testing of the hypothesis then took place. Both H_1 and H_2 were validated, as the p-value was found to be lower than 0.05. However, both H_3 and H_4 had p-values that were more than 0.05, thus it was necessary to conclude that these hypotheses should not be accepted.

CHAPTER 5

5.0 DISCUSSIONS, RECOMMENDATIONS & CONCLUSIONS

5.1 INTRODUCTION

This chapter will provide the reader with a summary of the data that were analysed in the previous chapter (chapter 4), allowing them to understand the reasoning behind the researcher's conclusion. Following that, there are some recommendations included in this chapter. These recommendations may offer an additional topic that is connected to this issue, which means that this can be the subject of further investigation for future academics. In the end, chapter 5 will come to a close with the conclusions, in which the author's own view will be offered to resolve the concerns that were presented in chapters 1 and 2.

5.2 DESCRIPTIVE STATISTIC ANALYSIS SUMMARY

An analysis of the data gathered from respondents in Section A is what's required to complete the Descriptive Statistical Analysis. There are a total of 150 replies, which have been filled out by 150 different respondents in Malacca, Malaysia. There were 64 female respondents, which accounts for 42.7% of the total respondents, and 86 male respondents, which accounts for 57.3% of the total respondents. Then, out of the total of 150 respondents, 85 of them, or 56.7%, are between the ages of 20 and 24 years old, 34 of them, or 22.7%, are from the age group of 25 to 30 years old, 23 of them, or 15.3%, are in the age group of 31 to 40 years old, and 8 of them, or 5.3%, are in the age group of 40 years old and older.

In addition to that, 99 of the respondents are Malay, which accounts for 66.0% of the total respondents, and 10 of the respondents are Chinese, which accounts for 6.7% of the respondents. In addition, nine of them, or 6.0% of the total, are Indian, while the remaining 32 respondents, or 21.3% of the total, are of a different race. However, every single one of my replies is a native Malaysian; none of them are from other countries. Following that, the Descriptive Statistics Analysis is carried out by analysing the education data. There were 48 responses from SPM, accounting for 32% of all respondents, 36 (24%) from Diploma, and the greatest number of respondents from Degree level. Another 7 or 4.7% are Masters, with just 1 responder, or 0.7%, holding a PhD. The remaining three responders, or 2.0%, are from different educational levels.

Last but not least, Descriptive Statistics Analysis is carried out by analysing the estimated work experience of the farmers. There are 30 respondents which is 20% are work less than 1 year. The highest respondents are from 1 year to 2 years work experience which is 58 respondents or 38.7%. Subsequently, 39 respondents or 26% are from 3 years to 5 years experience of work and there are 23 respondents or 15.3% are from more than 5 years work experience.

5.3 SCALE OF MEASUREMENT

5.3.1 Research Validity

This study's research validity is determined using Pearson Correlation. As a consequence, it is done to establish the validity of the relationship between the independent factors of performance and effort, social impact, facilitation condition, and the dependent variables of Smart Farming adoption in Malacca, Malaysia agriculture. Social impact has the greatest Pearson Correlation of 0.752 when compared to other independent factors. However, were 0.580, 0.531, and 0.631, respectively. Table 4.23 shows that performance Expectancy, effort Expectancy, social influence, and facilitation condition all have a

strong positive relationship with the dependent variable. Because the significant output between all of the variables is 0.000, which is less than 0.05, a meaningful link may be inferred.

5.3.2 Research Reliability

To determine the reliability of the questionnaire, a reliability test was initially conducted during a pilot test. The data gathered from the 150 respondents was then subjected to a reliability test in order to determine the validity of this study. For perceived performance Expectancy, effort Expectancy, social influence, and facilitation condition, the relevant Cronbach's Alpha Values are 0.693, 0.888, 0.915, and 0.794. The whole output's Cronbach's Alpha value is 0.934. The study may be deemed to be very dependable since the Cronbach's Alpha score is greater than 0.80.

5.4 DISCUSSION

5.4.1 Objective 1: To identify the factors impacting the adoption of Smart Farming.

The initial goal of this study is to determine the elements influencing Smart Farming adoption. This study sought to identify a few parameters influencing the adoption of Smart Farming in agricultural Malacca, Malaysia. Performance expansion, effort expansion, societal effect, and facilitation condition are among the aspects considered. The findings of the Multiple Regression Analysis data analysis were utilised to prove the hypothesis. As a result, the results demonstrated that performance expectancy and effort expectancy have a significant relationship with adoption of Smart Farming, as the p-values calculated using Multiple Regression Analysis are both 0.000, which is less than 0.05 to demonstrate a significant relationship. However, the findings of Multiple Regression Analysis revealed that the pvalues of social effect and facilitation

condition are more than 0.05, at 0.311 and 0.596, respectively. As a consequence, the findings demonstrated that neither social influence nor perceived risk had a significant link with Smart Farming adoption in Malaysia's agricultural industry.

In essence, this study determined that effort expendancy and performance expendancy are the elements influencing the adoption of smart farming. The reality of 2015 expectations, according to Zuiderwijk, Jansen, and Dwivedy, is a variable component in a person's adoption and usage of a new system or technology. Raden Edi Sewandono defined performance expectation as the anticipated effect of a technology's functional advantage even under unclear circumstances (2022). Because farmers feel that the complexity found in smart agriculture may boost their productivity in addition to providing high-quality goods from this cultivation, this performance expansion is totally embraced. It has been shown that effort expenditure has a favourable impact on the adoption of smart farming in Malaysian agriculture. The perceived effort to adopt a new system or technology rises with job experience, according to the 2021 Census of Agriculture; Citeseer: Philadelphia, given that the learning curve is higher for people who are just entering the agricultural profession.

5.4.2 Objective 2: To investigate the most significant factors of Smart Farming.

The experimenter's ability to manipulate the independent variable is fundamental to the scientific method. The variable that undergoes change as a result of the independent variable is called the dependent variable. Possible causal link between the two factors. An effect on the dependent variable might be expected if the independent variable is altered. The researcher then employs Beta. Based on Thomas J.Catalano, 2021. In order to compute beta, regression analysis was used. A security's price is likely to move in lockstep with the market if beta 1 is present. The price of the investment is likely to be more volatile than the market if the beta value is larger than 1. It tends

to be less volatile than the market if the beta value is less than 1. A beta value higher than 1.0 indicates a potentially more variable price for the securities than the market. To know the significant of independent and dependent variable are from the coefficients which is from the SPSS result Beta and the p-value.

The beta coefficient for the difference between performance expectancy and the adoption of Smart Farming in the agriculture sector is 512, which is more than 1. According to Venkatesh et al. (2020), expected performance is the degree to which a person believes that utilising modern technology would boost performance expectancy. The concept of "perceived usefulness" is used in this behavioural model. As a result, farmers may accept the expected performance since, although the Smart Farming technology accessible in the agricultural industry is not as sophisticated as that available in other countries, the equipment offered is capable of easing farmers with modern technology. In addition to improving agricultural output and quality, the agriculture sector has made every effort to upgrade current technologies. Among the technologies used in Malacca's agricultural industry are drones for watering and fertilising trees, sensors for measuring soil humidity and plant temperatures, and sophisticated equipment and robots for cutting plants.

The expected effort is the most essential component in Smart Farming. Expectation of effort is founded on the assumption that there is a link between the effort put in at work, the results obtained from that effort, and the reward received as a result of that effort (Ghalandari, 2016). Khatimah and Halim (2015) discovered that effort expectancy is positively related to effort expectation and Smart Farming adoption. This is because of the fact that the more modern technology that is brought into the agricultural sector, the more farmers are enticed to test it out in their ordinary work. The expectation of effort is often related to a person's conduct. As a result, this factor is

accepted to be more than beta 304 and greater than one since farmers like trying new things.

Another aspect identified in this study is social influence and facilitating situation. However, there is no beneficial association between social impact, facilitation condition, and Smart Farming adoption in Malaysian agriculture. According to the findings of a complete Multiple Regression Analysis, the p-value of social influence and facilitation condition are 0.311 and 0.596, respectively. Because 0.311 and 0.596 are more than 0.05, the researcher was forced to reject the alternative hypothesis and accept the null hypothesis. According to Bahner, T. in the journal Designing agricultural companies according to personal goals in 2016, inexperienced users of technology tend to follow the opinions of others and use technology to receive positive feedback from influential peers, even if they have negative reactions to the technology themselves. As a result, the adoption of Smart Farming does not rely solely on social influence and facilitation conditions, because the effectiveness of a new technology is through the individual, who is honing one's abilities to give good performance in using a new technology that can improve one's abilities and help increase one's income in the company.

The two eliminated independent variables, namely social impact and facilitation condition, are nevertheless significant, despite the fact that this research does not support these major aspects. To make these two factors significant for the implementation of Smart Farming in Malaysia, further in-depth study is required. Social influence is required to make Smart Farming more practical for everyone, particularly farmers in rural regions, as well as to increase the enabling circumstances essential for Smart Farming to operate and fulfill its goals in the agricultural sector.

Finally, performance expectations and effort expectations are

two critical components in Smart Farming. This can be observed in the SPSS data, which is the Coefficient indicating that the beta and p-value are quite acceptable based on the questionnaire that's been provided to contemporary farmers. While social influence and facilitating conditions are not significant with the implementation of Smart Framing in the agriculture sector in Malacca.

5.5 IMPLICATION OF RESEARCH

Planned strategies for this research may be implemented in a variety of ways or are referred to as possibilities. It is highly recommended that modern farmer companies consult the factors discussed in this study in order to plan an effective strategy for ensuring that their agriculture continues to grow with high quality, is capable of producing products that can satisfy customers, and is also able to produce products in large quantities quickly. The results of this study demonstrate that performance expectation is beneficial. This advantage must be used and strengthened by the agricultural sector to ensure that Smart Farming is very efficient in enhancing the quality and quantity of the nation's crops. In the next several years, for instance, our nation will not face a scarcity of food supplies if agriculture is well-managed and smart technology is both efficient and quick. Smart farming should be investigated further so that it might one day infiltrate the global market. Therefore, the products produced by our intelligent farmers will not only be able to fulfill the domestic need, but will also be suitable for export. This is also capable of increasing the country's income.

Since performance Expectancy has been identified as a factor in the adoption of Smart Farming in Malaysian agriculture, farmers should improve their performance while carrying out their jobs using the new technology. When farmers apply this sophisticated new technology, their knowledge and experience will expand. Even though this new technology can execute many jobs simultaneously, it still needs human control. As long as people are required for the deployment of a new technology, the sector's individuals may continue to refine their skills. Corinne Bernstein wrote in the Smart Farming

journal in 2019 that smart farming is a management concept that focuses on providing the agricultural industry with the infrastructure to leverage advanced technology, such as big data, the cloud, and the internet of things (IoT), for tracking, monitoring, automating, and analysing operations.

In addition, all of the independent factors in this research must be investigated in more detail if this Smart Farming technology is to advance and be acknowledged at all levels of society. This may not only assist a sector, but also present-day people in several ways. Farmers that use Smart Farming will undoubtedly produce higher-quality crops that are in high demand by the community.

5.6 LIMITATION OF RESEARCH

This study's limitation is that it solely studies modern farmers who operate in Malacca, Malaysia's agricultural industry. However, it is rare for academics to identify an agricultural sector in Malacca that employs Smart Farming technology in its whole. Even though Smart Farming is now popular in the agricultural sector, there are still agricultural sectors that depend solely on conventional agriculture to satisfy client demand. To deliver the questionnaire to the farmers, the researcher must locate the company's head in order to give the questionnaire to the farmers.

One further shortcoming of this research is the wide variety of ideas and viewpoints that were provided by the participants. Every reply offers a unique perspective and point of view on the subject at hand. There is a possibility that the findings of the study will be influenced in some way by other elements that weren't taken into account throughout the investigation.

5.7 RECOMMENDATIONS FOR FUTURE RESEARCH

This researcher advises that future researchers evaluate the two independent variables that were rejected in this study, namely social influence and facilitation condition, for future investigations. This is due to the fact that

these two aspects are critical in assuring the efficacy of Smart Farming technology in the present agricultural industry. Social influence is important in ensuring that more farmers are currently familiar with Smart Farming technology and are able to apply it in their agricultural sector, as well as modern farmers are able to improve their abilities if facilitating conditions in an industrial sector are completed perfectly.

Aside from that, this result recommends further research to find other reasons in the adoption of Smart Farming agriculture in Malaysia. Future studies may concentrate on issues other than those previously highlighted in this study. Future research might incorporate aspects such as environmental effect, acceptability of traditional farmers, and other criteria to determine additional significant factors. The researchers of this study also invite future studies to investigate the variables that lead to a few communities or farmers being less supportive of smart agriculture in the agricultural industry.

Future research should also attempt to account for differences in outcomes depending on various states or cities. This is due to the fact that some cities with fertile land and a large agricultural sector, such as the state of Perak, which is famous for the cultivation of rice, rubber, and palm oil, have more options to be given in the questionnaire and practise Smart Farming in order to meet the needs and demands of consumers. Different cities' consumer lifestyles will also act differently. As a consequence, future researchers may concentrate on outcomes rather than separating them based on data acquired from various cities or areas.

5.8 CONCLUSION

Nowadays, smart farming has provided significant benefits to the industrial sector. Although Smart Farming is an expensive technology to begin, it will be highly advantageous and beneficial in the agriculture sector in the future. According to the findings of this research, there is a strong and positive association between the growth of performance and the development of efforts toward social influence, as well as accommodating situations. The data analysis findings, however, demonstrate that there is no substantial association for societal impact, and the circumstances favour the application of Smart Farming in agriculture. After analysing the reliability test findings using SPSS, it was determined that this research is in the Excellent range and may be accepted in the study of Smart Farming.

In general, this study discusses the effectiveness of using Smart Farming in the agricultural sector. All variables studied in this research, such as performance expectations, effort expectations, social influence and facility conditions. This is important because it can help farmers to better understand the effectiveness of Smart farming in the sector. It is also useful to increase the overall economy and income of the country as well as to sustain the industry.

APPENDICES

THE EFFECTIVENESS OF SMART FARMING IN MALAYSIA AGRICULTURE SECTOR

SECTION A: DEMOGRAPHIC PROFILE

Please answer all the question in this part.

Sila jawab semua soalan di bahagian ini.

1. **Gander**/ *Jantina**

☐ Male/ Lelaki

☐ Female/ Perempuan

2. **Age**/ *Umur**

☐ 20-24

☐ 25-30

☐ 31-40

☐ 41 and above

3. **Race**/ *Bangsa*

☐ Malay

☐ Chinese

☐ Indian

☐ Other: _____

4. **Education Level/** *Peringkat Pendidikan*

☐ SPM

☐ Diploma

☐ Degree

☐ Master

☐ PhD

☐ Other: _____

5. Estimated Work Experience

Anggaran pengalaman bekerja

☐ Less than 1 year

☐ 1 year to 2 years

☐ 3 years to 5 years

☐ More than 5 years

SECTION B: ADOPTION OF SMART FARMING IN AGRICULTURE MALAYSIA

This section provides a statement about the adoption of Smart Farming in agriculture Malaysia. Please rank your statement by using the appropriate scale:
Bahagian ini memberikan pernyataan tentang penggunaan pertanian pintar dalam pertanian Malaysia. Sila susun pernyataan anda dengan menggunakan skala yang sesuai:

1 = Strongly Disagree

1 = Sangat tidak setuju

2 = Disagree

2 = Tidak setuju

3 = Neutral

3 = Berkecuali

4 = Agree

4 = Setuju

5 = Strongly agree

5 = Sangat Setuju

1. IR 4.0 is the trigger for Smart Farming technology in Malaysian agriculture.

IR 4.0 merupakan pencetus terhasilnya teknologi Smart Farming dalam bidang pertanian Malaysia.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

2. Spraying fertilisers, pruning trees, and regulating plant quality are no longer performed by humans.

Menyembur baja, mencantas pokok, dan mengawal kualiti tumbuhan tidak lagi dilakukan oleh manusia.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

3. The automotion process of agricultural and farming reduced human interaction but improve the efficiency.

Proses automotif pertanian dan pertanian mengurangkan interaksi manusia tetapi meningkatkan kecekapan

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

4. By using technology, farmers can manage soil condition more effectively and at less expense by monitoring them from any location

Dengan menggunakan teknologi, petani boleh menguruskan keadaan tanah dengan lebih banyak dengan berkesan dan pada perbelanjaan yang kurang dengan memantau mereka daripada mana-mana lokasi.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

5. Traditional ways of managing livestock, like spotting cows, are not fully automated and have many inefficiencies, such as more human interaction, more work, more power use, and more water use.

Cara tradisional menguruskan ternakan, seperti mengesan lembu, tidak automatik sepenuhnya dan mempunyai banyak ketidakcekapan, seperti lebih banyak interaksi manusia, lebih banyak kerja, lebih banyak penggunaan kuasa dan lebih banyak penggunaan air.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

6. Smart Farming cannot work without an internet network.

Smart Farming tidak boleh berfungsi tanpa rangkaian internet.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

SECTION C: PERFORMANCE EXPECTANCY

This section provides a statement about the performance expectancy in Smart Farming. Please rank your statement by using the appropriate scale:

Bahagian ini memberikan pernyataan tentang jangkaan prestasi dalam penggunaan pertanian pintar. Sila susun pernyataan anda dengan menggunakan skala yang sesuai:

1 = Strongly Disagree

1 = Sangat tidak setuju

2 = Disagree

2 = Tidak setuju

3 = Neutral

3 = Berkecuali

4 = Agree

4 = Setuju

5 = Strongly agree

5 = Sangat Setuju

1. Farmers can improve work performance more efficiently by using Smart Farming.

Petani boleh meningkatkan prestasi kerja dengan lebih cekap dengan menggunakan Pertanian Pintar.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

2. Using Smart Farming technology for agriculture allows our country to follow global development trends

Menggunakan teknologi Smart Farming untuk pertanian membolehkan negara kita mengikuti trend pembangunan secara global

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

3. Smart farming will help farmers do their jobs more quickly.

Pertanian pintar akan membantu petani melakukan kerja mereka dengan lebih cepat.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

4. Agricultural products from Smart Farming are of better quality compared to traditional agriculture.

Hasil pertanian daripada Smart Farming lebih berkualiti berbanding dengan pertanian tradisional.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

5. Smart Farming can save time in producing production.

Smart Farming boleh menjimatkan masa dalam menghasilkan pengeluaran.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

SECTION D: EFFORT EXPECTANCY

This section provides a statement about the effort expectancy in Smart Farming. Please rank your statement by using the appropriate scale:

Bahagian ini memberikan pernyataan tentang jangkaan usaha dalam penggunaan pertanian pintar. Sila susun pernyataan anda dengan menggunakan skala yang sesuai:

1 = Strongly Disagree

1 = Sangat tidak setuju

2 = Disagree

2 = Tidak setuju

3 = Neutral

3 = Berkecuali

4 = Agree

4 = Setuju

5 = Strongly agree

5 = Sangat Setuju

1. All farmers in the agricultural area must be courageous in order to attempt something new.

Semua petani di kawasan perladangan perlu berani untuk mencuba sesuatu yang baru.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

2. Smart Farming may help enhance your abilities.

Perladangan Pintar boleh membantu meningkatkan kebolehan anda.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

3. Smart Farming technology is an easy thing to learn.

Teknologi Smart Farming merupakan suatu perkara yang senang dipelajari.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

4. Applying Smart Farming technology in agriculture is an interesting thing for old farmers.

Menerapkan teknologi Smart Farming dalan bidang agriculture merupakan suatu perkara yang menarik bagi para petani lama.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

5. Modern innovations like smart farming may be the catalyst for the nation's development.

Inovasi moden seperti pertanian pintar mungkin menjadi pemangkin kepada pembangunan negara.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

SECTION E: SOCIAL INFLUENCE

This section provides a statement about the social influence in Smart Farming. Please rank your statement by using the appropriate scale:

Bahagian ini memberikan pernyataan tentang pengaruh sosial dalam penggunaan pertanian pintar. Sila susun pernyataan anda dengan menggunakan skala yang sesuai:

1 = Strongly Disagree

1 = Sangat tidak setuju

2 = Disagree

2 = Tidak setuju

3 = Neutral

3 = Berkecuali

4 = Agree

4 = Setuju

5 = Strongly agree

5 = Sangat Setuju

1. Smart Farming causes farmers to be more creative in their work.

Smart Farming menyebabkan para petani semakin kretif dalam pekerjaannya.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

2. The farmers will work together in learning something new.

Para petani akan bekerjasama dalam mempelajari sesuatu yang baru.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

3. Experienced workers are responsible for teaching new farmers in learning Smart Farming.

Pekerja yang berpengalaman bertanggungjawab mengajar para petani baru dalam mempelajari Smart Farming.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

4. To maximise the impact of smart farming, all farmers must have the same goal.

Untuk memaksimumkan kesan pertanian pintar, semua petani mesti mempunyai objektif yang sama.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

5. Leaders are crucial in ensuring that their agricultural keep up with the current of agricultural modernisation.

Pemimpin amat penting dalam memastikan pertanian mereka mengikuti arus pemodenan pertanian.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

6. Workers must be gradually exposed to new technology so that farmers can readily comprehend it.

Pekerja mesti didedahkan secara beransur-ansur kepada teknologi baru supaya petani mudah memahaminya.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

SECTION F: FACILITATION CONDITION

This is the last part. This section provides a statement of facilitation condition in Smart Farming. Please organize your statement using the appropriate scale:

Ini adalah bahagian terakhir. Bahagian ini memberikan pernyataan tentang keadaan kemudahan dalam Perladangan Pintar. Sila susun pernyataan anda dengan menggunakan skala yang sesuai:

1 = Strongly Disagree

1 = Sangat tidak setuju

2 = Disagree

2 = Tidak setuju

3 = Neutral

3 = Berkecuali

4 = Agree

4 = Setuju

5 = Strongly agree

5 = Sangat Setuju

1. Many agricultural companies in our country have implemented Smart Farming

Telah banyak syarikat pertanian dalam negara kita melaksanakan Smart Farming

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

2. Smart Farming technology (Robot, drone, solar) can be used for a long period of time.

Teknologi Smart Farming (Robot, drone, solar) boleh digunakan untuk jangka masa yang panjang.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

3. Smart farming needs more effort to deploy in rural areas due to the lack of a sophisticated internet infrastructure.

Pertanian pintar memerlukan lebih banyak usaha untuk ditempatkan di kawasan luar bandar kerana kekurangan infrastruktur internet yang canggih.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

4. No internet, then no Smart Farming.

Tiada internet, maka tiada Smart Farming.

STRONGLY DISAGREE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

STRONGLY AGREE

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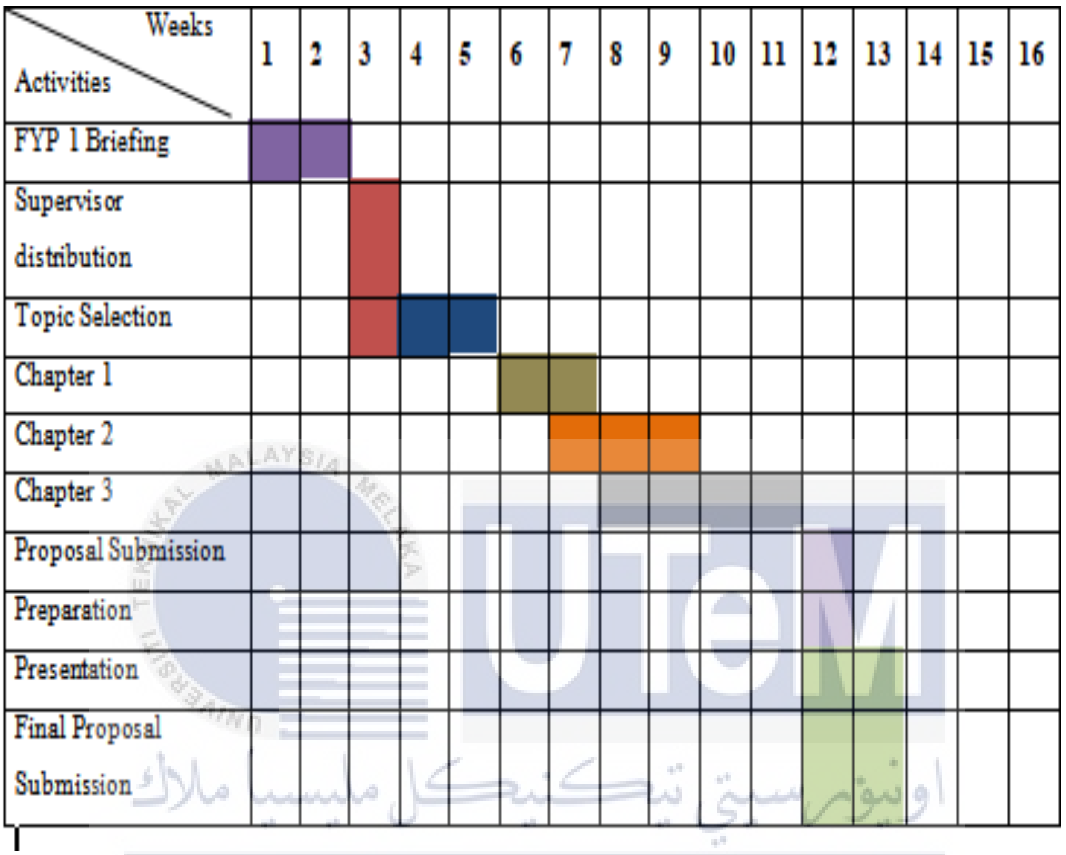
Gantt Chart of Final Year Project 1



Gantt Chart of Final Year Project 2

WEEK/ ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Create Questionnaire									MID SEMESTER BREAK							
Distribute Questionnaire																
Collect Questionnaire																
Analysis Data																
Submission Chapter 4																
Submission Chapter 5																
Proposal Correction																
Slide Preparation																
Submission of FYP 2																
Presentation 2																

For further information regarding this questionnaire, please contact:
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