

# A CONCEPTUAL I-GRICULTURE BUSINESS MODEL: STRENGTHENING FOOD SECURITY AND NURTURING B40 AGRO-PRENEURS

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**ABSTRACT:** The importance of agriculture is often overlooked even though it is in fact among the areas that have a vital role in ensuring the availability of food supply and raw materials to resource-based industries. Lack of support and exposure to this field can cause the agriculture sector to be dim, and this can result in a lack of food production and raw materials in our country, which are basic necessities needed in ensuring the livelihood of the community. Furthermore, there are B40 families who struggle to get adequate food supplies, and this can happen due to their low income, under-employment or unemployment factors. This challenge can be overcome by encouraging B40s to venture into agriculture, utilizing underutilized land, and supporting them to start businesses as agropreneurs. Hence, the purpose of this paper is to develop a conceptual business model including a digital platform and applications as an effort to facilitate and support B40s, farmers, and the public as agropreneurs. By supporting them, two of the goals of the United Nations Sustainable Development Goals (SDGs) which can be achieved are SDG 2: Zero Hunger (end hunger, achieve food security, improve nutrition and promote sustainable agriculture) and SDG 8: Decent Work and Economic Growth (promoting productive work and decent work for all). This paper adapted the Design Thinking (DT) methodology which helps in understanding the key problems and challenges of various customer segments (CS) before viable solutions are formulated and made, which includes conducting literature reviews, benchmarking, surveys on CS, low-fidelity prototyping, and testing potential solutions. Furthermore, an initial conceptual business model (BM) was developed using several business modeling tools, which are Environmental Map (EM), Business Model Canvas (BMC), Value Proposition Design Canvas (VPC), and Strategy Canvas (SC) which were then tested and validated by various CS. Thus, a validated conceptual BM including a low-fidelity prototype, as the possible solution is offered in this paper.

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**KEY WORDS:** Agriculture, Food security, B40s, Conceptual business model, Digital platform, Design thinking

## **1. INTRODUCTION**

Traditional business models no longer work in the new normal. Covid-19, disruptive technologies, shifting consumer behaviours, and increasing ESG awareness impacts of business and technology have forced companies to rethink their entire business model (Vaz, 2021). ESG stands for Environmental, Social, and Governance. Technology with the application of the Internet of Things (IoT) is a highly promising technology that offers many innovative solutions to modernize many sectors in this world, including the agriculture sector. Agriculture is one of the important fields in our country, as it plays a major role in economic growth and development and as a food supplier, it is a cornerstone of human existence. A digital platform is a medium that is useful for both beginners, to start their business, find information and guidance about agriculture fields, and also for experts to expand their company to a bigger market.

The application that is to be developed is i-Griculture. It is an application that will support the farmers and agro-based stakeholders to make their work and activities more efficient, so their productivity and yields can be increased. This idea is also in line with the goal of SDG number two, which is to reduce zero hunger by ensuring the existence of food security, and this can be implemented by ensuring that farmers can produce adequate food resources. This application is suitable for those who are interested in farming or agriculture, farmers who need guidance, the public and also agro-based organizations. This application will somehow provide agriculture related information as well as helping to increase employment opportunities in agriculture.

## **2. OBJECTIVES**

The main objectives of i-Griculture are:

1. To increase agropreneurs and employment opportunities for the B40s.
2. Provides a platform that promotes sharing of trusted and relevant agro-based information with farmers, the general public, and stakeholders.
3. Provides buyers and farmers with a marketplace, physical and digital, where they can sell or buy fresh agriculture products.
4. To encourage the general public to get involved in agriculture.
5. Increase the productivity and agricultural yields to achieve food security.

## **3. METHODOLOGY**

This paper adapted the Design Thinking (DT) approach that consists of five stages, which are empathizing, defining, ideating, prototyping and testing with the aim of solving complex problems and finding desirable solutions that meet the requirements of customer segments (CS). Empathizing was done by conducting literature review (LR) and benchmarking including an online survey that consists of questionnaires in order to learn and understand the problem and challenge faced by the CS. A literature review summarizes and evaluates a body of writing about a specific topic (Knopf, 2006), and benchmarking is a process that involves measuring the performance of your business against a competitor in the same market (Business Victoria, 2021). Then the problem was defined by constructing a point of view (POV) based on CS problems to improve the current business model (BM). After that, ideation is done by brainstorming to come up with several possible

solutions. This is where initial Business Model (BM) was developed which include Business Model Canvas (BMC), Value Proposition Canvas (VPC), Environment Map (EM) and Strategy Canvas (SC). BMC provides a generic framework and a set of guiding principles for developing and redeveloping a business model (Osterwalder & Pigneur, 2010). It helps to create value for the business. VPC helps you make sure that a company's product or service is positioned around customers' values and needs (Pereira, 2021). EM helps to map their business environment's forces in a structured and tangible way (Amarsy, 2015). It is organized into four areas, which are: Market Forces, Key Trends, Industry Forces and Macro-Economic Trends. SC allows organization to see in one simple picture key factors an industry competes on and invests in, what buyers receive, and what the strategic profiles of the major players are (Kim & Mauborgne, 2004). A low fidelity prototype that represents the digital platform or app is created. The conceptual BM and the low fidelity prototype will be validated and tested by various CS.

## **4. LITERATURE REVIEW**

In our research in developing i-Griculture, we noticed that an application that specialises in local agriculture is not a new thing. However, these applications are sparse in number and all of them are developed to fulfil the niche market of users. Unlike them, i-Griculture has been developed to become a one-stop centre for all agriculture-related businesses or organizations, whether it is to become a credible source of agriculture-related information or a reliable marketplace where customers can either buy or sell their products safely.

### **4.1. History of Modern Agriculture**

Modern agricultural practices in the country can be dated back to the 1780s with the arrival of the British in the state of Penang. The British took an interest in developing the agriculture practices of the country at the time, as it was noticed by them that Malaya had fertile soil. Thus, in 1790, began the country's early export-oriented agriculture with pepper planting in Penang, Malaysia. Pepper planting had paved the way for a larger scale and more prominent types of crop plantations to be introduced to the country by the British, such as rubber in 1876, palm oil in 1917, and cocoa in 1950.

At the moment when Malaya gained its independence from the British in 1957, the agriculture industry of the country had become so profitable that it had become the country's most essential economic industry. Moreover, in the effort to transform the country into a developed nation the government had launched an initiative to handle the resettlement of rural poor into newly developed areas with the creation of the Federal Land Development Authority (Felda). Since then, Felda has become one of the most important pillars in the country's economy. One of its private corporate entities, FGV Holdings Berhad, has also been considered as one of the world's largest plantation operators, with 811,140 hectares (2,004,400 acres) of oil palm plantations. Hence, it can be stated that the curiosity of the colonials had become the start of an industry that would stay relevant to this day.

## **4.2. Challenges**

### **4.2.1. Effects of Climate Change**

Climate change is a current global phenomenon that has been drastically impacting our everyday lives, as reported by the Swiss Re Institute that up to 18% of the global GDP will be lost by 2050 if the global temperature increases by 3.2°C (Swiss Re Institute, 2021). Climate change refers to the changes in the planet's climate conditions. This phenomenon will then raise the Earth's temperature. As the planet keeps increasing as time goes by, the ocean will get warmer, and the glaciers will melt at an unprecedented rate, hence making sea levels higher. The direct possible effect of the phenomenon is the frequency of floods or droughts. An example of the impact of the phenomenon on Malaysia is the recent flood in the Peninsular, which resulted in more than 30,000 evacuated people. This is just the tip of the iceberg of its possible impact on us. According to the report by the Ministry of Agriculture and Food Industry (MAFI), the same flood had also resulted in more than RM67.72 million of losses for the national agro-food sector (MAFI, 2022). Furthermore, as mentioned before, as days go by based on a report by the Institute for Economics and Peace (IEP), it is predicted that the global community, with Malaysia included, is expected to encounter more losses in the upcoming decade due to the phenomenon as these drastic changes in the weather pattern will occur more frequently (IEP, 2019).

### **4.2.2. Impact of COVID-19**

COVID-19 is a coronavirus pandemic that has shaken the global community since the first quarter of 2020. Malaysia had recorded its first confirmed case of the pandemic in early 2020. In just a month, as the pandemic condition worsens, the government has announced the Movement Control Order (MCO) on March 18, 2020, as a measure to avoid the collapse of the country's health care system. MCO has restricted the movement of all citizens, whether Malaysians or foreigners. Hence, it has disrupted the movement of the workers in the logistics industry, which then resulted in disruption in the food supply, which greatly affects the agriculture industry (Wahab A., 2020). It is recorded that through the survey conducted by an online home services platform, Recommend.my, it is found that only in the second quarter of 2020, the country's Gross Domestic Product (GDP) has contracted by 17%, nearly 70,000 small and medium-sized entrepreneurs went out of business, which resulted in the loss of jobs for more than one million people (Recommend, 2020).

### **4.2.3. Food Security**

Due to the pandemic, a prevalent question regarding the country's food security condition has been brought to the government's attention, as it was reported by the World Bank's COVID-19 High Frequency (HiFy) Household Monitoring Survey was that almost 60% of the households experienced an income reduction of up to RM700 as most business institutions had ordered a pay cut in order to avoid larger losses (IBRD, 2021). Furthermore, the price of fresh produce is reported to increase to the extent that the government has enforced an act to control the price of certain controlled products, which usually happens during the festivities, and the

inadequate local food supply, which has been greatly disrupted due to the enforcement of MCO, has resulted in an unprecedented threat of food insecurity in a country known for its food export capability (Wahab A., 2020). This situation will lead to more serious problems such as depression, domestic violence, malnutrition, physical growth retardation, and many more.

#### **4.2.4. Underutilized Land**

Malaysia, as a nation, is currently home to an advanced level of agriculture technology ecosystem. Unfortunately, as reported by the World Bank, with only 26.09% of truly utilised agricultural land, it is pale in comparison to our neighbouring nations, such as Thailand with 43.28% and Indonesia with 33.18% (IBRD, 2018). These underutilised lands, that sometimes called as wasted revenue lands where not only it does not bring any economic benefit to the local authority as in some cases these lands are the place where the weed grows uncontrollably, and garbage strewn undeveloped spaces will cost the local government some expenses to just maintaining it. Furthermore, the existence of underutilised land in the area can also be linked to a higher crime occurring probability in the area (Austin et al., 2012). Hence, it can be said that by reducing the amount of underutilised land, the authorities will be able to kill two birds with one stone as both economic benefits and a lower crime rate will be achieved.

#### **4.3. Industrial Revolution 4.0**

The agriculture industry is a lucrative industry that has been able to provide support for the country's development for hundreds of years. It is recorded that the industry had generated around RM48 billion in 2020, an exponential increase from RM20 billion in 2009. However, the low productivity of the industry has become the government's main concern as reported the commodity production has decreased to only 10,811 metric tonnes in 2017, which is a 3.4% reduction compared to 2015 (Fauzy , 2020). To combat this, the government has initiated an initiative in 2018 with the introduction of the Industry Revolution (IR) 4.0. Although the initiative will focus on the manufacturing industry at first, it is planned to be extended to other industries, with the agriculture industry included in it. This modernization of the industry is estimated to boost its production capacity. It will also be supported by more advanced and greener technologies. Furthermore, as listed in the MySTIE, which is an integrated framework to revolutionise the country's science and technology-related industries, the integration of IoT into agriculture will also produce other benefits, such as the creation of better automated precision farming, which can cut the energy and water needed to operate the land, which consequently will lead to a lower cost and more sustainable agriculture practice. Next, the government also expects that this application of innovation will encourage more agro-based entrepreneurs to eventually become participants in the industry. This modernization will result in the increased utilisation of big data, and the Internet of Things in agricultural practices. This initiative is aligned with the current worldwide trend of the integration of automation technology into industries as it has been proven to be able to increase the quantity and the quality of products. At the same time, the sustainability of the business is guaranteed as it is more cost-efficient in the long run.

### **4.3.1. Smart Farming**

Smart farming is a concept that refers to the implementation of the Internet of Things (IoT) in the farm (Markova, 2020). The inclusion of more advanced machinery that is fueled by artificial intelligence (AI) technology, such as the autonomous robotic labour for planting and the unmanned aerial vehicles (UAV) for imaging, these processes will aid human labour, making the farm management less labour intensive, hence increasing the productivity of the farm. Through the data collected, this can help farm owners to understand the data, which can give them special attention to the vulnerabilities and needs of each crop. This helps growers make effective decisions and achieve maximum production of healthy plants in the fastest and smartest way (Ali et al., 2020). It is also worth mentioning that since smart farming takes less space, it is also popular with the urban community, hence the term "urban farming" came to an existence, as an example of urban farming is the initiative by the Urban Farming 1000 Masjid that takes the opportunity to utilise the available space in the masjid vicinity. This initiative will give the masjid an extra source of income and also give the congregation a chance to participate in farming, which may spark their interest in the agriculture world. Next, urban farming in urban areas does utilize multiple approaches in order to optimize the production, a great example of this is the Urban Hijau initiative which is an initiative located in the city center of Kuala Lumpur that utilizes the concept of backyard gardens, this initiative not only produces fresh produce but also empowers the surrounding communities to take care of their own waste by educating them and helping establish more sustainable urban farms. Last but not least, this agricultural revolution will also increase food safety as with the integration of IoT it will enable better food traceability. This agricultural innovation, we believe, with time can evolve the country's agricultural sector and bring it to a new height. Hence, it is crystal clear that smart farming, which is based on a more precise and resource-efficient approach, is the future of the country's agricultural industry as it can deliver a more sustainable and productive form of agricultural production.

### **4.4. Benchmarking**

Benchmarking is a critical component in the development of i-Griculture Application. It does help to assist in identifying key features that can be developed and improved in the i-Griculture App. Furthermore, thorough research will help us to identify our strengths and weaknesses. Some other apps can also be our reference and guidance during the development of this application.

#### 4.4.1. AgriApp : Smart Farming App



Fig.1. AgriApp: Smart Farming App

AgriApp is an Android-based mobile application. AgriApp is a technology-based smart agriculture app with complete agricultural production and management solutions. This online marketplace brings together farmers, agricultural inputs, retailers, and fulfillment services on a single digital platform. This app helps Indian farmers to make better decisions to increase their profitability by using the latest technology. AgriApp is the best app for agriculture students who are interested in agriculture. The information provided to the customers through AgriApp is timely and accurate. Being India's best agricultural application that assists farmers in a variety of ways, including soil testing, crop advisory, drone services, crop practices, and more.

AgriApp: SmartFarming App Key Activities is a platform to buy crop solutions and market prices, which provides crop tonics, fertilizers, spreaders, and others. It also shares information about the Science of Art of Agriculture through Packages of Practices (POP's) for each different crop. There is also a platform where farmers can get real-time Agro-Advisory service from Agri Experts through videos, chat, or images, and also have a chat with the farmer community to solve any problems regarding agriculture. Their Key Resources are partnerships with the experts and weather forecast systems. The value Proposition is basically focused on the Indian community. All of these are stated based on the description stated on the Google Play website.

#### 4.4.2. EzyAgric Farmer



Fig. 2. EzyAgric Farmer

This app helps the farmers order genuine agricultural inputs. Users can map their farmland for better decision-making, which means that they can sketch their own farming area. This app also enables farmers and buyers to sell and buy products. Users can record their farm transactions automatically on the App. The farmer interacts with a village agent or agronomist in real time. This app also views daily weather conditions by district in Uganda. It can be used to set reminders and ensure you do not forget to do any farm activity on time. Have a glimpse at farming through the tips section. Besides the app, there is also the EzyAgric website. On the website, they sell fertilizers, seeds, and herbicides to farmers. Based on the website, there are various features, which are: agrishop, farm records and analysis, ezycredits, extension and advisory, and market linkage.

#### 4.4.3. E-AGRO



Fig. 3. E-AGRO

E-AGRO is an e-commerce platform to help Malaysian smallholders and farmers. It is also the go-to online-to-offline marketplace for agricultural smallholders in Malaysia. They do sell fertilizer, veterinary products, seedlings, tools, urban farming, agrochemicals, and also animal food. Their mission is to help Malaysian agriculture smallholders to gain better yields through premium quality products and improved plantation practices. They have conducted extensive research with the support of the Malaysian Palm Oil Board (MPOB) and University Agriculture Park,



University Putra Malaysia (UPM), on the effects of quality fertilisers on the production yields of the agriculture sector. Their Key Partners are CIMB Bank, which offers a 0% Instalment Plan, the Ministry of Agriculture and Food Industries (MAFI), POSSTORE, and INFO PERTANIAN.

## 5. INITIAL BIZ MODEL (BM)

The Business Model Canvas (BMC) provides a generic framework and set of guiding principles for developing and redeveloping a business model (Osterwalder & Pigneur, 2010) that helps to create value for the business.

### 5.1. Initial Business Model Canvas (BMC)

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>• Ministry of Agriculture and Food Industries (MAFI).</li> <li>• Ministry of Agriculture and Agro-Based Industry (MOA).</li> <li>• Federal Agricultural Marketing Authority (FAMA).</li> <li>• Malaysian Agricultural Research and Development Institute (MARDI).</li> <li>• Malaysian Agrifood Corporation (MAFC).</li> <li>• Agrobank.</li> <li>• Delivery Service (Grab Food Delivery, Foodpanda).</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>• Development of i-Griculture application.</li> <li>• Provides information about farming.</li> <li>• Marketing.</li> <li>• Selling and buying products.</li> <li>• Product delivery.</li> <li>• Provide financial support.</li> </ul>	<p><b>Value Proposition</b></p> <ul style="list-style-type: none"> <li>• Free access to information on reskilling and up-skilling programs, knowledge and latest news in agriculture.</li> <li>• Platform to sell or buy agriculture related products.</li> <li>• Trusted platform for buying and selling fresh agro-based products from B40s, expert's farmers or organizations.</li> <li>• Trusted platform to donate, support and help the B40s, farmers and the public to venture into agriculture.</li> <li>• Cooperation with agro-based organizations.</li> <li>• Utilize idle land to be used for agriculture.</li> </ul>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>• Review and rating.</li> <li>• Incentives.</li> <li>• All in one information center.</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>• <b>B40 Farmers, sellers</b> - Those who need work and free guidance and support to venture into agriculture.</li> <li>• <b>Farmers, sellers</b> - Those who want to improve their farming skills and gain access to the latest information and knowledge about agriculture.</li> <li>- Those who need a platform to sell agriculture related products.</li> <li>• <b>General Public, buyers</b> - Those who are interested in agriculture and its products.</li> <li>• <b>Agro-based organizations, sellers</b> - Those who want to help and support B40s, farmers and the public to do farming.</li> <li>- Those who need a platform to share information and sell or buy agriculture related products or items.</li> <li>• <b>Donors</b> - Those who want to help B40s and support farmers and the public.</li> </ul>
<p><b>Cost Structure</b></p> <ul style="list-style-type: none"> <li>• Labor Cost</li> <li>• Overhead Cost</li> <li>• Maintenance</li> <li>• Licenses</li> </ul>		<p><b>Revenue Streams</b></p> <ul style="list-style-type: none"> <li>• Commission fee</li> <li>• Shipping fee</li> <li>• Advertisement</li> <li>• Sponsorship</li> <li>• Donation</li> </ul>		

### 5.2 . Initial Value Proposition Canvas (VPC)

The Value Proposition Canvas (VPC) is a business model tool that was developed by Alexander Osterwalder and Yves Pigneur to complement the Business Model Canvas (BMC). The VPC serves as a framework to ensure that there is a fit or compatibility between the product and the market, and it consists of two parts, which are the customer profile and the value map. Furthermore, VPC helps to create value for customers and make sure that a company's product or service is positioned around customers' values and needs (Pereira, 2021). Therefore, the importance of this canvas is to create the value of the i-Griculture app

for B40 farmers and sellers, farmers and sellers or buyers, the general public and buyers, agro-based organizations and sellers, and also donors. The figures below show the VPC B40 farmers and sellers, farmers and sellers or buyers, the general public and buyers, agro-based organizations and sellers, and also donors.

## VALUE PROPOSITION CANVAS

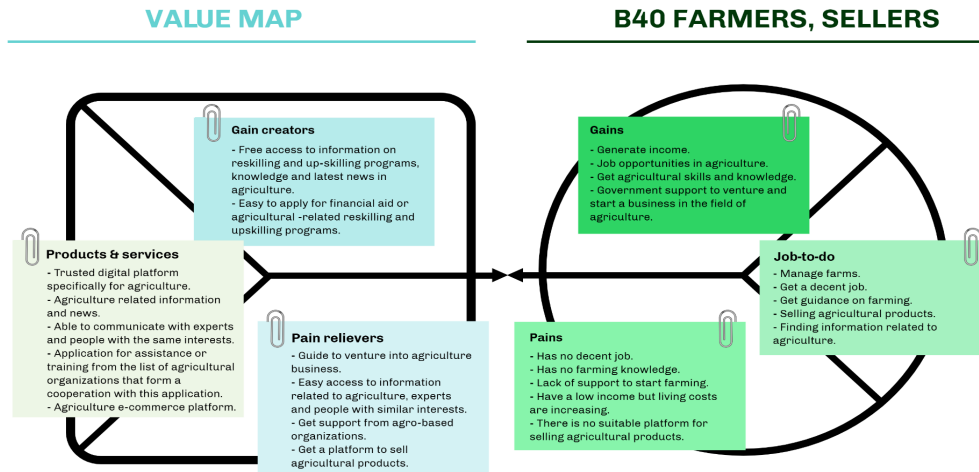


Fig. 4. Value Proposition for B40 Farmers or Sellers

## VALUE PROPOSITION CANVAS

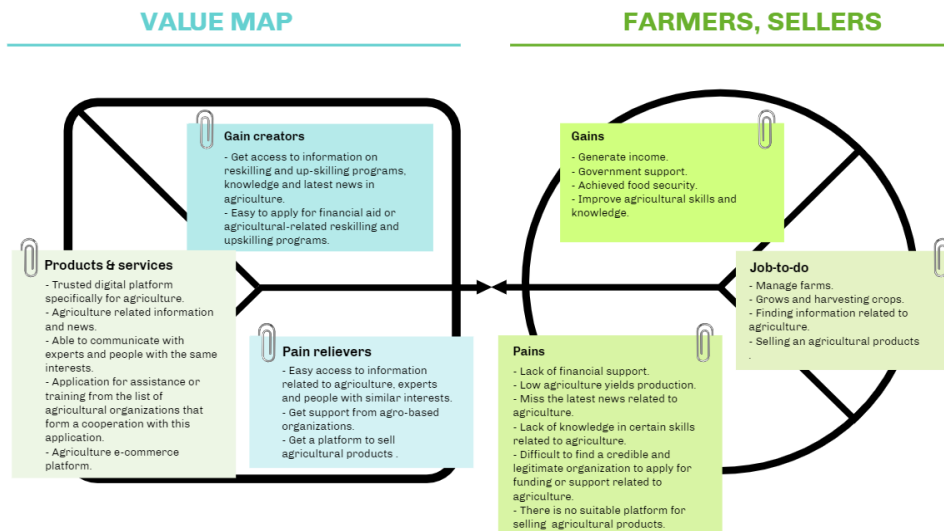


Fig. 5. Value Proposition for Farmers or Sellers

# VALUE PROPOSITION CANVAS

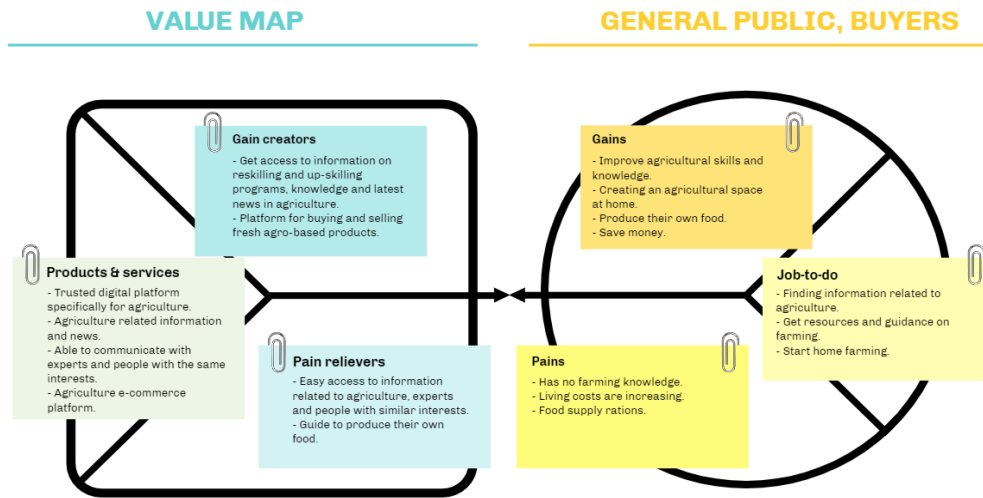


Fig. 6. Value Proposition for General Public or Buyers

# VALUE PROPOSITION CANVAS

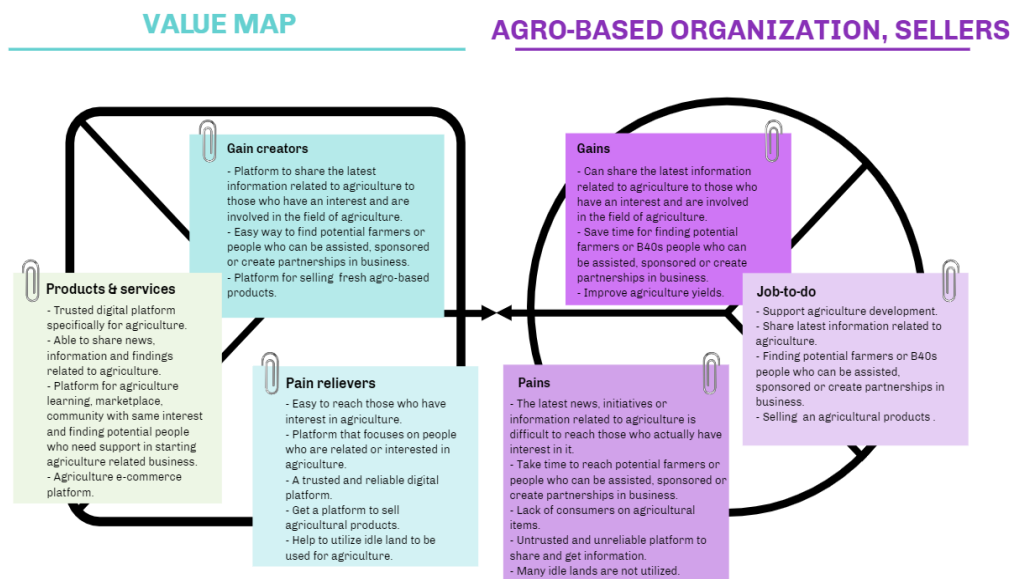


Fig. 7. Value Proposition for Agro-based Organization or Sellers

# VALUE PROPOSITION CANVAS

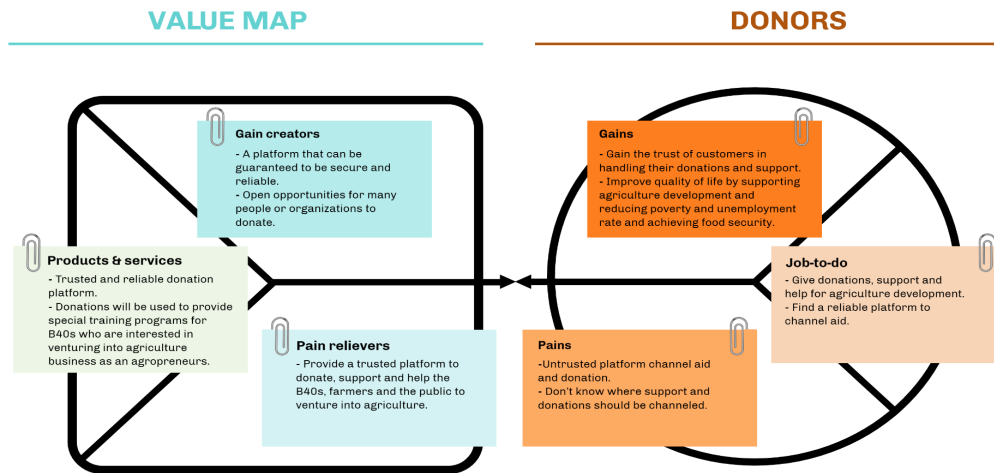


Fig. 8. Value Proposition for Donors

## 6. CONDUCT VALIDATION OF INITIAL BM & KEY FINDINGS

### 6.1. Online Survey

To validate i-Griculture's initial business model, an online survey was conducted by using Google Form Survey. 16 questions were created in order to validate the business model canvas and to help improve the parts which are necessary. The respondents of this survey are open to the public of all ages, primarily targeting the i-Griculture customer segments which are public, B40s farmer, farmer, agro-based organizations or donors. Based on the results of the distributed questionnaire survey, a total of 21 respondents have completed the survey. These respondents consisted of 81% students, 9.5% full-time workers and also 4.8% for each part-time and unemployed worker. Most of the respondents are students because this survey is widely disseminated among students as opposed to the general public, hence, these results may be slightly biased.

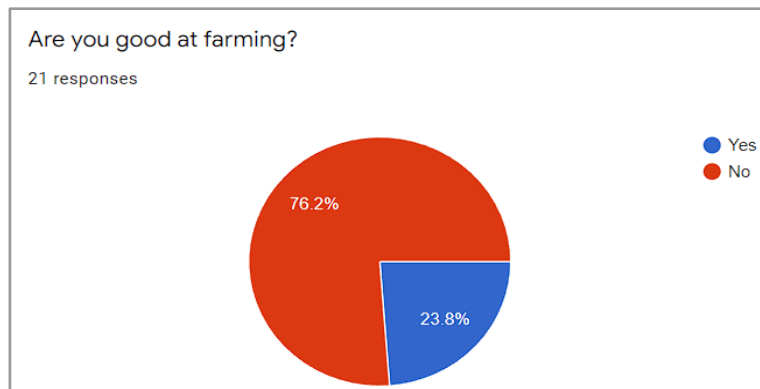


Fig. 9. Section 1 Question 3

After respondents stated their employment status, they were asked if they were interested in agriculture. Most of the respondents are interested in agriculture,

holding 66.7% of the total number of the respondents, however when they were asked whether they are good at farming or not as the third question, 76.2% of the respondents responded 'No' and this indicates that people who are interested in a something does not necessarily mean that they have in-depth knowledge or skills related to the things.

The fourth question asked about the importance of agriculture in a country and all respondents agreed that agriculture is important in a country. Then, the fifth question asked whether the respondents think the world has succeeded in overcoming hunger and poverty or not of which the majority 81% responded 'No' while the remaining 19% were 'Yes'. The sixth question was asked about the categories of respondents included. The majority with 81% of respondents included in the category of public or donor and 9.5% for each farmer and B40 farmer.

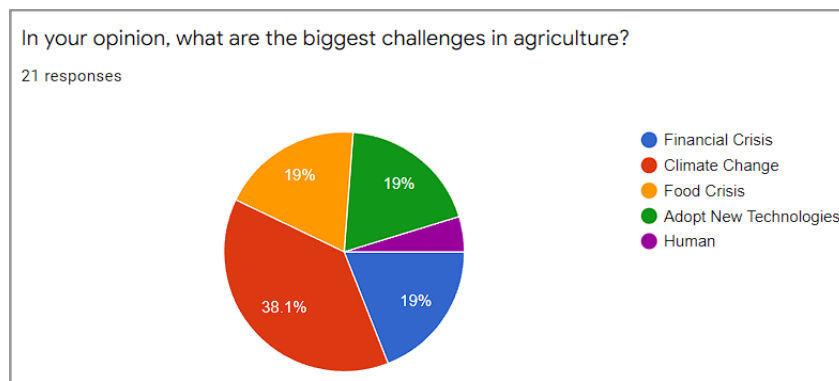


Fig. 10. Section 2 Question 1

For the next section, the questions asked are open to the public, donors, B40s and farmers. Among 21 responses, 38.1% of them agree that the biggest challenges in agriculture is climate change, followed by financial crisis, food crisis and adoption of new technologies with 19% each respectively. Only merely 4.9% of the respondents' state that humans are the biggest challenge in agriculture.

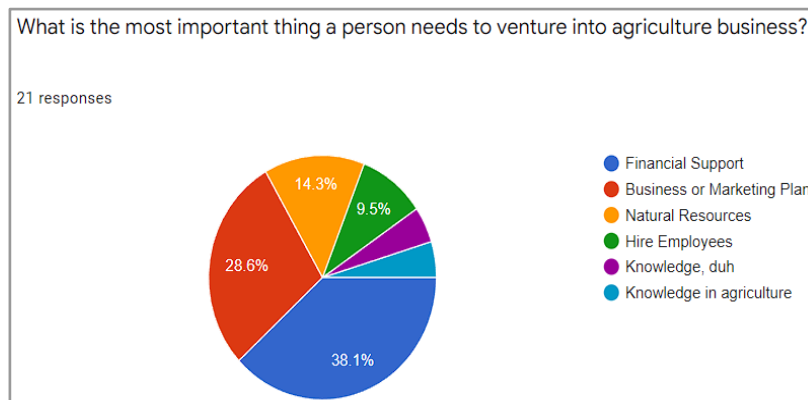


Fig. 11. Section 2 Question 2

As for the second question, 38.1% respondents agree that the most important thing a person needs to venture into agriculture business is financial support, meanwhile 28.6% of them choose business or marketing plan as the most important

thing before starting agricultural business, followed by natural resources with 14.3%, hiring employees with 9.5% and knowledge and knowledge in agriculture with 9.5%.

Next, respondents were asked with a question whether they know any kind of assistance provided by the government or agriculture related organizations for farmers and those who are interested in venturing into agriculture. Majority of the answer is they do not really know any. Some of them make an assumption that the government provides loans for those who need it but do not mention which sector provides the loan. Some of them mention MARDI, FAMA, and FELDA.

Next, in our opinion we had to ask the most important question, which is whether they do agree or not if we develop an app to ease the farmers, and they 100% agree.

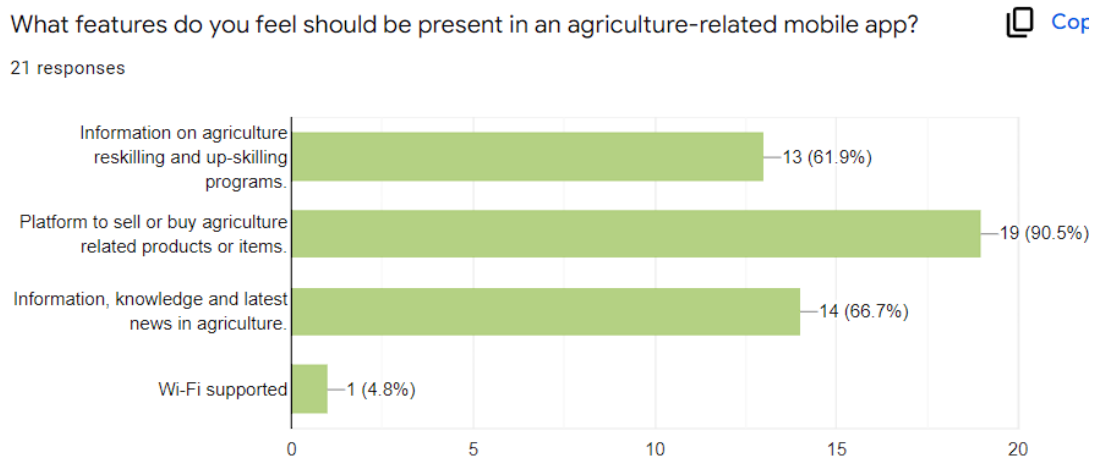


Fig. 12. Section 2 Question 5

For the fifth question in this section, we asked the respondents for their opinion of the feature they felt should be present in an agriculture-related mobile application. Based on the results for the question, a conclusion that can be made is that the respondents prefer the application to provide a platform that enables the farmers to buy and sell their products (90.5%), provide necessary information on agriculture reskilling (66.7%), and also provide credible news on the agriculture world (61.9%).

The sixth question that was asked of the respondents in this section was whether they had used any agriculture-related applications previously, and if they had, they were then asked to provide the application name. The majority of the respondents had never used any agriculture-related application before, as 80.9% of the responses were either "No" or "Nah". Hence, this actually proves our point is that even individuals who are interested in agriculture do not even utilize the agriculture-related applications that are available on the market.

Then, the seventh question for the second section that was asked of the respondents was whether they actually know of any online platform that allows its users to sell or buy agricultural products, and if they do, they were then asked to provide the platform's name. An interesting observation that can be noticed from the respondents' answers is that 90.5% of the responses stated that they did not know of any website that allowed their users to buy the farmers' products (66.7%) and

some of them responded with general eCommerce websites such as Shopee, and Lazada (23.8%).

Online farming marketplace should be available to farmers. What do you think?
21 responses
Yes
I think it should be available. This can help farmers to enlarge their business and prevent waste of farming resources.
It would be a great idea. However, in order for the marketplace to be fully utilized by all farmers would be a hustle because farmers (especially the older generation) might involving in farming activities just for their own survival (for food and daily expenses).
Maybe
Yes, to make it easier for buyer and seller to buy and sell their product online
Indeed.
Yes, if it can be done , it will be a good initiative to help the farmers.

Fig. 13. Section 2 Question 8

The last question that was asked of the respondents for this section was, in our opinion, an essential question, as it is important for us to know whether or not the general public does support the idea of an online farming marketplace being made available to farmers, because it is one of the most significant functions of i-Griculture. Fortunately for us, based on the responses gained from the respondents, 90.5% of them do agree with the idea. Furthermore, some of the responses even provide us with their creative ideas that can be utilized to improve the marketplace even more.

As in the last section, which is the conclusion section, for question 1, we state that we must improve food security. We asked the respondents their opinion on how to solve this problem. Various opinions were recorded as their responses. Some of the respondents are not aware of the meaning of food security. However, there are still a lot of good opinions. One of the brilliant opinions is that the respondent suggests people to start doing home farming and support the farmers. The other opinion is "*mempertkasakan industri pertanian negara*", which means to empower the agricultural industry in our country. This should be done by the leaders or the government itself.

Next, for question 2, we asked their opinion on how they support agriculture. Majority of the respondents' answers are to buy local products and buy from the small farmers to help these small-scale agriculture businesses. Besides that, there are also some respondents who support agriculture by planting their own vegetables at home, like coriander, mushroom etc for individual consumption. These are how they support agriculture with their own style.

Last but not least, based on the opinions given by the respondents, it shows that the agricultural industry is still relevant in our country but not much information about

agriculture is delivered to society. As we recall from the survey, all the respondents agree if we build an application to share information about agriculture, which can be beneficial to the farmers. In conclusion, an online farming marketplace and information center should be developed to help the farmers and also to spread the awareness of the importance of agriculture in our community in Malaysia.

## 7. VALIDATED BUSINESS MODEL (BM)

### 7.1. Validated Business Model (BM)

Based on the online survey findings, the validated business model using BMC framework for i-Griculture is as follows:

<b>Key Partners</b> <ul style="list-style-type: none"> <li>Ministry of Agriculture and Food Industries (MAFI).</li> <li>Federal Agricultural Marketing Authority (FAMA).</li> <li>Malaysian Agricultural Research and Development Institute (MARDI).</li> <li>Federal Land Development Authority (FELDA)</li> <li>Agrobank</li> <li>CIMB Bank</li> <li>Delivery Service (Shopee, Lazada, Carousel).</li> </ul>	<b>Key Activities</b> <ul style="list-style-type: none"> <li>Development of i-Griculture application</li> <li>Provides information about farming.</li> <li>Marketing.</li> <li>Selling and buying products.</li> <li>Product delivery.</li> <li>Provide financial support.</li> </ul>	<b>Value Proposition</b> <ul style="list-style-type: none"> <li>Free access to information on farming or agropreneurs reskilling or up-skilling programs, knowledge and latest news in agriculture.</li> <li>Platform to sell or buy agriculture related products.</li> <li>Trusted platform for buying and selling fresh agro-based products.</li> <li>Trusted platform to donate, support and help the B40s, farmers and the public to venture into agriculture.</li> <li>Cooperation with agro-based organizations.</li> <li>Utilize idle land to be used for agriculture.</li> </ul>	<b>Customer Relationships</b> <ul style="list-style-type: none"> <li>Review and rating.</li> <li>Incentives.</li> <li>All in one information center.</li> <li>Coaching or workshop.</li> </ul>	<b>Customer Segments</b> <ul style="list-style-type: none"> <li><b>B40 Farmers, sellers</b> <ul style="list-style-type: none"> <li>Those who need work and free guidance and support to venture into agriculture.</li> </ul> </li> <li><b>Farmers, sellers</b> <ul style="list-style-type: none"> <li>Those who want to improve their farming skills and gain access to the latest information and knowledge about agriculture.</li> <li>Those who need a platform to sell agriculture related products.</li> </ul> </li> <li><b>General Public, buyers</b> <ul style="list-style-type: none"> <li>Those who are interested in agriculture and its products.</li> </ul> </li> <li><b>Agro-based organizations, sellers</b> <ul style="list-style-type: none"> <li>Those who want to help and support B40s, farmers and the public to do farming.</li> <li>Those who need a platform to share information and sell or buy agriculture related products.</li> </ul> </li> <li><b>Donors</b> <ul style="list-style-type: none"> <li>Those who want to help B40s and support farmers and the public.</li> </ul> </li> </ul>
<b>Cost Structure</b> <ul style="list-style-type: none"> <li>Overhead cost - Staff salaries, Administrative, Office rent, Utilities</li> <li>Website development &amp; maintenance cost</li> <li>Marketing expenses</li> </ul>		<b>Revenue Streams</b> <ul style="list-style-type: none"> <li>Commission from selling and buying</li> <li>Advertisement</li> <li>Donation/sponsorship</li> </ul>		

#### a) Customer Segments

Customer Segments refer to the different groups of people or organizations that i-Griculture digital platform aims to reach or serve. There are five potential users or customers for this platform. First of all, it is the B40 farmers or sellers. They are people who belong to the low-income group or are unemployed and want to venture into agriculture. They need information, knowledge, financial support, free reskilling and up-skilling programmes related to agriculture or agropreneurs, and also a platform to sell their agriculture products. Second, farmers who can also be the sellers. They are farmers who want to improve their farming skills and gain access to the latest information and knowledge about agriculture. At the same time, they also need a platform to sell agriculture-related products. Third, the general public or users, who can also be buyers. They are the users who have an interest in



agriculture but have no knowledge of the field. They may also want to use this app to get or buy fresh agro-based products directly from the farmers or agro-based organizations. Fourth, agro-based organizations or sellers. It refers to the agro-based organizations that want to collaborate or have a partnership with this application with the aim of helping and supporting B40s, farmers, and the public to do farming, such as providing financial aid or upskilling programmes related to agriculture. At the same time, they also need a platform to share information and sell their agriculture related products to the other users of this application. The fifth and last is the donor. Donor is anyone who wants to donate to help B40s farmers and support agriculture development.

#### **b) Value Proposition**

A value proposition is something that can create value for our product or service that can solve problems and meet user or customer needs. It refers to the reason why they should choose our products. So, the i-Griculture app offers several benefits for users of this application. It offers free access to information on farming or business-related reskilling or up-skilling programs, knowledge and the latest news related to agriculture, which will benefit many people, especially B40s who are interested in agriculture. Next, it also provides a platform to sell or buy agriculture related products. In addition, this application has collaboration with various agro-based organizations to help and support the development of agriculture and at the same time this platform has a guarantee that it is safe and reliable to be used for buying and selling fresh agro-based products from B40s, expert farmers or organizations and also as a platform to donate, support and help the B40s, farmers and the public who want to venture into agriculture. Lastly, by supporting farmers and those interested in agriculture, idle land can be utilized and used for agricultural development.

#### **c) Channels**

Channels define how i-Griculture reach out and communicate with the customer segments in order to deliver its value proposition. i-Griculture has its own application which the user could download from the Play Store for Android and App Store for Apple devices to interact with the customer segments. i-Griculture also reaches out its customer segments by advertising through social media such as Facebook, Twitter and Instagram, also through Google Ads where the advertisement are broadcasted throughout the website that uses Google Ads such as YouTube and most of the sites out there.

#### **d) Customer Relationships**

Customer relationship is the type of relationship to build with certain consumer segments. i-Griculture builds and sustains the customer segments in various ways which are Review and rating, Incentives, and All in one information center. The user could give a review, ask questions, and rate the app on the App Store or Play Store. There are a lot of incentives such as guidelines, coaching and starter kits for farmers on this app so that it eases the farmers to survive and strive in the agriculture industry. Furthermore, one of the features of the app is all in one information where the farmers could gain all the knowledge and tools they need such as latest news regarding the agriculture industries and a marketplace where they can buy and sell tools for agriculture purposes.

**e) Key Activities**

Key Activities describe the most important things a company must do to make a company operate successfully. There are three types of Key Activities, which are production, problem-solving, and platform. As for the production, we proposed developing an app called i-Griculture. The thing that we must focus on in the first place is the development of the app. We must plan thoroughly to build the systems and interfaces that are user friendly. As for problem solving, the purpose of building this app is to help people who are interested in farming. Through this app, we will provide information about farming, do some marketing and advertising. We are also focusing on helping the B40s to earn their income by farming. We will try to assist them by providing information about companies or NGOs that can help and providing financial support. There will also be a platform or section, in the i-Griculture app, where farmers can sell their products directly to the consumer. To make it easier for the customer, we proposed hiring a delivery service company to do product delivery. Delivery services are common in this era. As for the platform, this is the platform we plan to create in order to help the beginners and also for the experts to provide support.

**f) Key Resources**

Key Resources in business models that allow an enterprise to create and offer a Value Proposition, reach markets, maintain relationships with Customer Segments and earn revenues. Key resources can be physical, financial, intellectual, or human. Key Resources can be owned or leased by the company or acquired from key partners. The Key Resources that are used are Intellectual Property resources, as the i-Griculture Application is an app. The app is a platform that can be used as a guide for people who want to be involved in the agricultural field. We also need to build and maintain the database of this app to make sure that every important data and transaction is kept and disclosed by the third party. Besides intellectual property resources, Human Resources are also needed as Key Resources. There will be a lot of valuable information about farming that will be shared by the agro-based NGOs, farmers' associations or companies. The last Key Resources for i-Griculture is Financial Resources. The purpose of these partnerships with the banks and also big and stable companies are to help farmers that need financial support, but only if they are interested to invest in the farmer or the farmer meets the requirements set by them.

**g) Key Partners**

Key Partners are also one of the important elements in the Business Model Canvas. Key Partners means another party, company or organization that is interested in building a partnership in a business venture. Firstly, our Strategic Alliances will be with the Ministry of Agriculture and Food Industries (MAFI) and the Federal Agricultural Marketing Authority (FAMA). The co-opetition partners will be the delivery service companies. The Malaysian Agricultural Research and Development Institute (MARDI) and the Federal Land Development Authority (FELDA) can provide us with valuable information about farming. Agrobank and CIMB Bank can jointly venture as their focus is to support new business or start-up farmers financially.

#### h) **Cost Structure**

The cost structure in order to manage i-Griculture will include mandatory expenses such as the software development cost and the website/apps maintenance cost, which are the overhead costs (rent, utilities) and the personnel's salaries. Both are necessary for the website in order to deliver its objectives. Last but not least, we had also included the marketing expenses.

#### i) **Revenue Streams**

The main way i-Griculture will generate its income is through the sale commissions gained through its eCommerce function. The website offers paid advertisements that are available to any interested agriculture organisation that wishes to advertise their events or affiliated products. The third and last way to generate income is through the voluntary donations of any interested individuals or organisations who want to support the initiatives to nurture B40 agropreneurs.

### **7.2. Environmental Map (EM)**

1) Market forces: The emergence of a new move towards a healthier diet that is locally sourced as it is deemed safer, which is led by millennials worldwide, has given the opportunity for SMEs to compete with the large conventional growers. Moreover, through applications like i-Griculture, where the free market does still exist, SMEs will have even more power for them to compete with large corporations.

2) Key trends: The integration of digital technology into our daily lives has led to the accelerated growth of the digital economy, especially eCommerce, as recorded that the country's first quarter of 2021 income generated through it surged 30.0% (Mahidin, 2021) compared to the previous years. This growth will only keep on increasing, resulting in more people conducting their business online, and this will lead to the application's eCommerce function becoming more relevant than ever.

3) Industry forces: i-Griculture's design of a one-stop centre for all agriculture-related businesses, whether it is for information sharing or its eCommerce function, makes it a unique application. This will allow the application to extend its market to become a globally relevant application.

4) Macroeconomic forces: i-Griculture has the capability to attract the attention of the general public who are interested in the agriculture industry as included in CS, as the application is free to register to join. Hence, the application can become a platform where those who are interested in farming, either B40 or not, can learn more about the agriculture industry and upskill themselves, consequently it can earn them a stable job, improve the country's unemployment rate.

### 7.3. Strategy Canvas

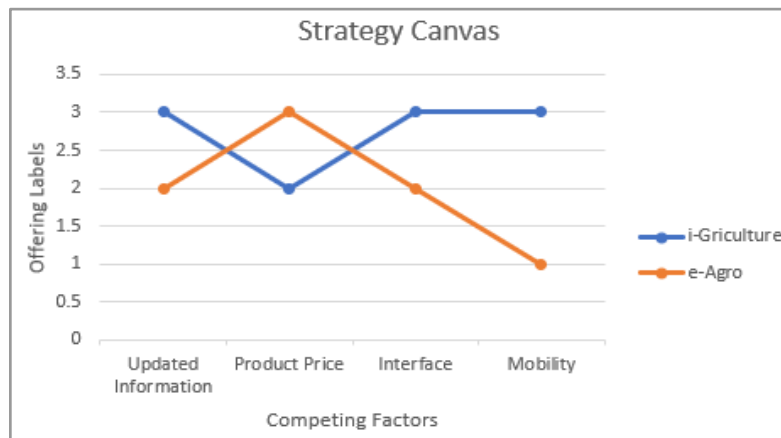


Fig. 14. Strategy Canvas

The strategic canvas compares i-Griculture and an app called e-Agro. This app is chosen because it is a local app and also serves the agriculture community. However, the strategic canvas shows that i-Griculture will be better. The first aspect is updated information will be updated frequently. Followed by the product price, interface and mobility.

### 7.4. Low Fidelity prototype apps

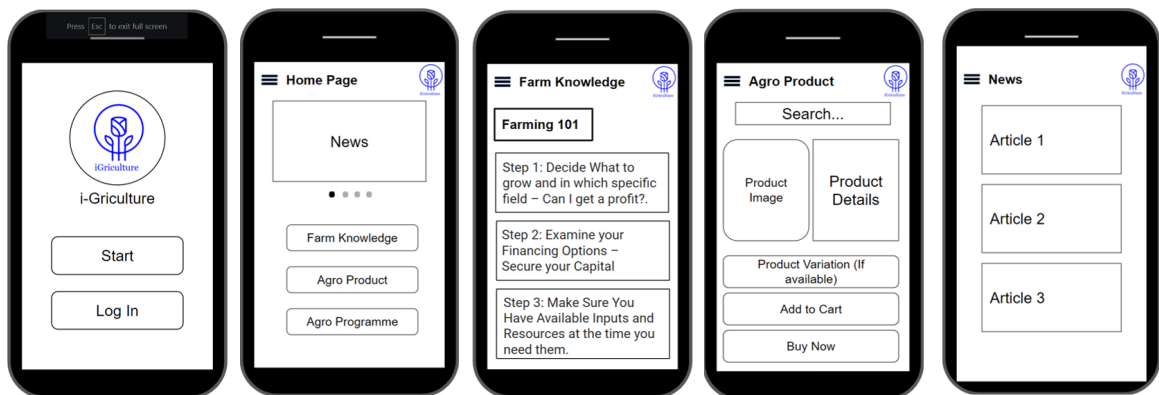


Fig. 15. i-Griculture Application Prototype

## 8. CONCLUSION AND FUTURE WORKS

In conclusion, i-Griculture is a multi-sided platform that allows its users to interact with each other from communication to market transaction. This conceptual business model gives the impression that the functions of the i-Griculture digital platform will include the sharing of information, skills and initiatives or assistance such as financial aid or free access to agriculture reskilling and up-skilling programmes from agriculture-related organizations. It can also be said that this platform acts as an intermediary between the organization and the users of this application. Unbeknownst to us, by providing support to those interested in

agriculture, we can also address hunger and poverty by creating food security and at the same time it can also create more employment opportunities in agriculture.

Future works include developing a detailed business plan for operation. This i-Agriculture conceptual business model needs to be periodically reviewed, updated and aligned with the latest and relevant technology or latest findings. As well as establishing collaboration or partnership with more agro-based organizations that supply goods, items or machines related to agriculture. By doing this, the agriculture e-commerce platforms can increase their product variety offerings, and attract more farmers and the general public to use this application. Thus, supporting farmers and those who are interested, especially the B40 group to get involved in agriculture. They will be provided with the knowledge and skills needed to empower and nurture the underprivileged B40s as agro-entrepreneurs.

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