

**THE KEY DETERMINANT OF SABAH'S YOUTHS TOWARDS THE
AGROPRENEURSHIP; ADOPTING INTERNET OF THINGS (IOT) APPLICATIONS,
IN THE DIRECTION OF GREEN PRACTICES AND SUSTAINABILITY**

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Abstract

The agricultural sector has been a synonym for Sabah in developing its economy. Proper planning during the production and delivery stages is important for Sabah to be one of the major food suppliers to meet Malaysia's needs. 'Rangka Tindakan Pertanian Sabah (2021–2030)'; in modernizing and increasing the productivity of the agricultural sector for adequate supply and price stability, is to be achieved. The launching of 'Halatuju Sabah Maju Jaya; Pelan Pembangunan SMJ 1.0 (2021–2025)', has categorized the agricultural sector as one of the thrust sectors that need to be focused on, in developing the Sabah's economy. Various missions on this have been established such as the need to modernize the sector, in order to increase the productivity and the output of products, generate more value-added products, improve the quality of products, and reduce reliance on imported food products. In 2020, Malaysia's food imports amounted to a record high of RM55.5 billion. The risk of food scarcity had increased as a result of the Covid-19 health emergency. This issue will become more crucial with the inevitable climatic, environmental, and scarcity of resources that can be expected in the near future. In responding to these problems, attention needs to be focused on rejuvenating our food-based agriculture sector. The aim of this study is to investigate the relationship between the Internet of Things (IoT) applications as the key determinant in influencing the youth of Sabah towards agropreneurship, in the direction of green practices and sustainability. A random sample of respondents among youth will be selected to answer related questionnaires. A quantitative approach to collecting data by using purposive sampling in selecting the respondents will be applied. The result will then be tabulated, analyzed, and discussed. The structural Equation Model will be used to analyze the collected data using Partial Least Square Method (PLS 3.0). A correlation of -0.187 was produced which showed insignificant results. By integrating the IoT alone will not have a significant impact on influencing the acceptance of youth towards the agriculture sector. Further study needs to be carried out on various variables, and hence a correct method approach can be established.

Keywords: *Agropreneurship, Internet of Things (IoT), Green practices, Sustainability*

Introduction

The agricultural sector has been a synonym for Sabah in developing its economy. With proper planning during the production and delivery stages, Sabah could be one of the major food suppliers to meet Malaysia's needs. 'Rangka Tindakan Pertanian Sabah (2021 – 2030)'; in modernizing and increasing the productivity of the agricultural sector for adequate supply and price stability, is to be achieved (Sabah Agriculture Blueprint 2021-2030, 2019). The launching of 'Halatuju Sabah Maju Jaya; Pelan Pembangunan SMJ 1.0 (2021 – 2025)' which was held on 28 – 31 March 2022, at the Sabah International Convention Centre (SICC), has categorized the agricultural sector as one of the thrust sectors that need to be focused in developing the Sabah's economy. Various missions on this have been established, such as the need to modernize the sector in order to increase productivity, to create more value-added products, improve the quality of fresh produce, and to minimize the dependency on imported food products. (Pelan Pembangunan SMJ 1.0: 2021-2025, 2022).

Malaysia's food imports amounted to a record high of RM55.5 billion in the year 2020. (Department of Statistics Malaysia Official Portal, 2022). The risk of food scarcity had increased, as a result of the Covid-19 health emergency. This issue will become more crucial with the inevitable climatic change, environment, and scarcity of resources that can be expected globally. In responding to these problems, attention needs to be focused on rejuvenating our food-based agriculture sector. This can be achieved through digitalization and technological adoption, and to innovate and power up the supply chain in reshaping this sector. The development of a technologically advanced and sustainable agriculture industry that is currently available, will be the key factor in resolving the issues that are being faced by Malaysia.

Based on data issued by the Malaysian Youth Development Research Institute for 2022, the population of Sabah's youth aged between 15 and 40 is numbered 2,071,400 people. Generally, youths are likely quick learners the use of new technologies, and hence on the handling and usage of IoT. Therefore the study is aimed on establishing the acceptance of youths of different field of studies, on their vision and perception of adopting the IoT's technology in the agriculture sector.

Literature Review

The concerns of insufficient food supply are a global issue. An increase in the cost of raw materials, fertilizers, pesticides, and others needs to be given due attention. This will directly be enhancing on the effort of controlling the cost of living due to rising inflation. The application of high technology and digitalization into the bicultural sector, will increase production and hence, will reduce the dependency on foods import.

Malaysia's digital economy blueprint for boosting cloud capabilities in Malaysia has been established. Through the first blueprint (2021 – 2022), the government aims to move towards a paperless environment and to migrate 80% of public data to the on a hybrid cloud system. The cloud services will enable the use of big data, artificial intelligence, the internet of things (IoT), and other applications in fulfilling the needs. Sabah has also established the 'Sabah State ICT Blueprint'. Matters that relate to the agriculture sector can be found in clause 12.2.4: Sabah Agro Knowledge Portal; pp264.

Malaysia is moving towards green technology and digital economy development. The Ministry of Science, Technology, and Innovation (MOSTI) is given the responsibility to ensure that there is a collaboration among the government, the private sector, and entrepreneurs for the

development of the digital economy and green technology in Malaysia. The collaboration is important for the ministry's strategic plan to succeed, especially the National Nanotechnology and Products Roadmap (2021 – 2025), in making Malaysia a prosperous high-tech country. The launching of the first East Malaysia digital Sandbox Internet of Things (IoT) was also held on March 01, 2022, at the SICC. Under the Ministry of Sabah Science, Technology and Innovation, this digital Sandbox will be used as catalyzed for economic development, especially on the development of digitalization of the State's key economic sectors.

'Malaysia is generally driven by a service-oriented industry whereby agriculture was placed at the third rank of government economic priority. In the agriculture sector, human capital empowerment has contributed to agricultural productivity and production success which relates to those people involved in farming as farmers. Recent insight reviled that farmers with the quality of an entrepreneur will largely succeed in agriculture-based business. Hence, a lot of agriculture-based business depends on agriculture entrepreneur in Malaysia'. (Muhammad, H, 2014). The study also found that; 'The entire respondent shows improvement after the incubation program and after fine finishing program, they become a successful entrepreneur where the evidence by their actions for at past, present experience, and in their future aims. This program is a good program meant to be an intermediary program that improves the lives of farmers and nurtured them to become experienced Agri-technology entrepreneurs.

'The implementation of modern techniques in the field of agriculture can get us humongous changes in the productivity of crops, making the farming techniques more efficient for the farmers. IoT can play a huge role in automating the process of agriculture. Farming based on IoT will help farmers to improve the productivity of the crops and reduce waste'. (Sweksha, G. 2019). The writer further reiterates; 'Smart agriculture using IoT can be basically termed as building a wireless system for automating the irrigation process and monitoring the crop field with the help of various sensors. These sensors can be light, humidity, temperature, soil moisture, etc. Using this modern technique, farmers can monitor the crop anytime from anywhere. These reasons make the modern technique of agriculture i.e. IoT highly efficient and reliable technique to persuade with'.

Smart farming is an emerging concept that refers to managing farms using technologies like IoT, robotics, drones, and Artificial Intelligence (AI). The aim is to increase the quantity and quality of fresh produce while optimizing the human labor requirements during production. Smart farming technology is the concept of connecting smart machines and sensors integrated into farms to make farming processes data-driven and data-enabled. Through IoT technology, farmers have access to real-time information or real-time data, to track weather forecasts, air quality, humidity levels, and amount of light, temperature, soil conditions, and others, to ensure healthier crop growth. Smart farms would have sensors embedded throughout every stage of the farming process and on every piece of equipment. Sensors being set up across the fields will be collecting data and be made available to the farmers for better management and control. Operations would be automated and this would reduce labor costs, reduce waste and improve on the service delivery. These would increase on competitiveness by lowering manufacturing costs, and hence, will increase the transparency with the customers. Data collection can be tracked in every state of businesses, plan for better product distribution, increase control over production, increase business efficiency, and better control over the production process.

Research Objective

The aim of this study is to investigate the relationship between IoT adoption as the key determinant of influencing the youth of Sabah towards agropreneurship, in the direction of green practices and sustainability.

Hypothesis

Based on the literature review, the following hypothesis has been developed:

H1: There is a positive relationship between adopting technology on IoT applications, among the youths of Sabah towards practicing green practices and sustainability.

Research Method

A random sample of respondents among the youth of Sabah was selected to answer related questionnaires. A quantitative approach to data collection, by using a purposive sampling method in selecting the respondents has been applied. The following are the steps involved in the data collection:

- Survey questionnaire via Google Form
- Primary data collected: 135 respondents in Sabah; aged between 18 to 40 years old.
- Adopting a Five-point Likert scale on the questionnaires.
- Data analysis using PLS-SEM

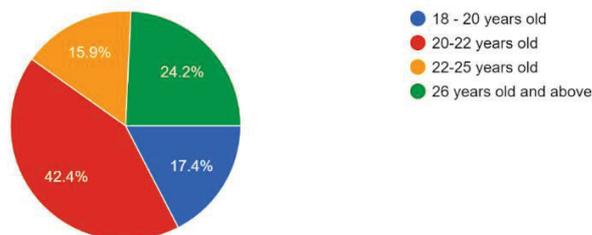
Data Analysis and Finding

Questionnaires on the above subject were carried out among the youth, with a random sampling method of 131 number of participants. The findings are as follows:

a) *The respondents' age group:*

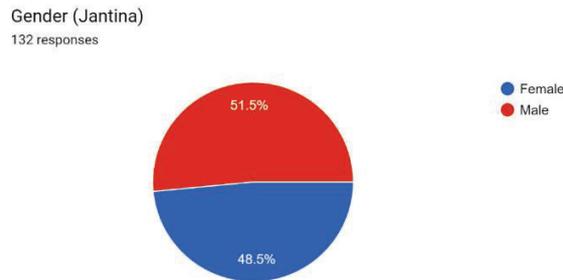
There are 4 categories of age groups; 75.8% of the respondents are between the age of 18 to 25 years old.

Age (Umur)
132 responses



b) *The gender; male and female.*

The respondents are balanced in gender category; 51.5% male and 48.5% female participants.



c) *Education background; 75.8% have/undergoing degrees in various fields.*

75.8% of the participants are currently undertaking degree courses in various field of study.

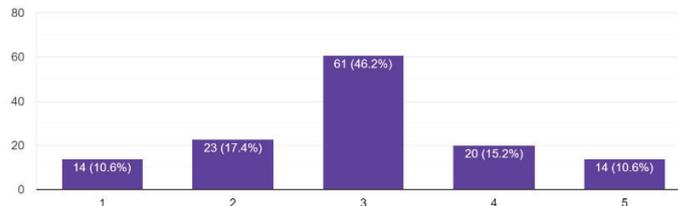


d) *First impression of the agricultural sector.*

impression of

46.2% neither/nor agree; thus showing great uncertainties on the level of hardness to be faced among the youth.

Your first impression in agricultural sector: Tanggapan pertama anda dalam sektor pertanian: I feel it is hard. Saya rasa ia sukar.
132 responses

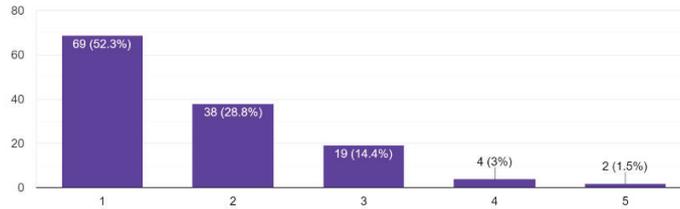


the

e) *Perception on agriculture sector. 52.3% of the respondent strongly*

disagree with the perception that the agriculture sector is dirty.

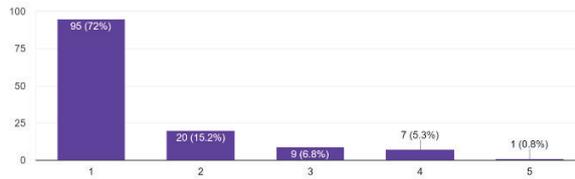
I feel it is dirty. Saya rasa ia kotor.
 132 responses



f) Agriculture sector for future job career. 72% strongly disagree that the agriculture sector

has no future for job carrier

I feel it has no future for job career. Saya merasakan ia tidak mempunyai masa depan untuk kerjaya pekerjaan.
 132 responses

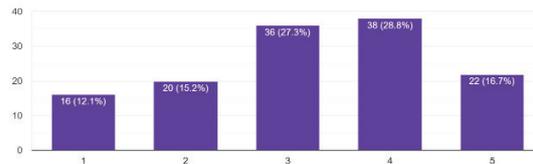


g) Experience in Internet of

Things

45.5% respondent shows that they know of what IoT is all about.

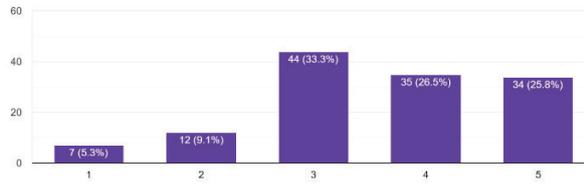
Experience in Internet of Things (IoT) Pengalaman dalam Internet of Things (IoT) I have been exposed to the IoT Technology. Saya telah didedahkan dengan Teknologi IoT.
 132 responses



h) Interested to involve in the agriculture sector with IoT integration.

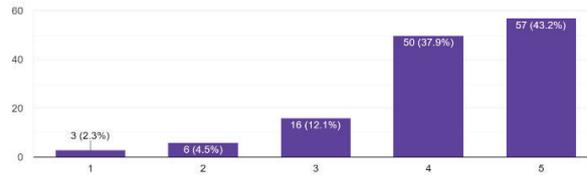
52.3% respondents have an interest to involve in the agriculture sector with IoT integration

I am interested to involve in agriculture sector with the IoT integration. Saya berminat untuk melibatkan diri dalam sektor pertanian dengan integrasi IoT.
 132 responses



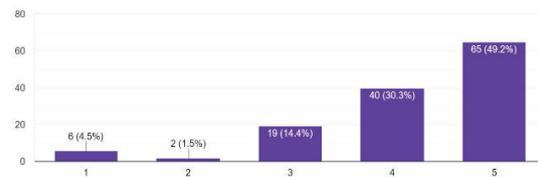
i) Integration of IoT towards the improvement of Malaysia's agriculture sector.
 81.1% of respondent have a positive perception of integrating IoT towards the improvement of Malaysia's agriculture sector

I have a positive impression on IoT integration in the agriculture sector towards the improvement of Malaysia's agriculture. Saya mempunyai tanggapan...ertanian ke arah peningkatan pertanian Malaysia.
 132 responses



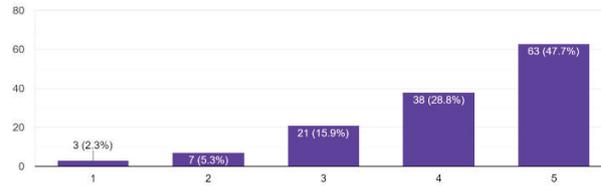
j) Integration of IoT in agriculture sector in supporting green practices towards the achievement of sustainability.
 79.5% agreed that by integration of IoT in the agriculture sector in supporting green practices will have a positive impact on the achievement of sustainability.

I believe the integration of IoT in the agriculture sector supports green practices towards the achievement of sustainability. Saya percaya integrasi... sektor pertanian ke arah pencapaian kelestarian.
 132 responses



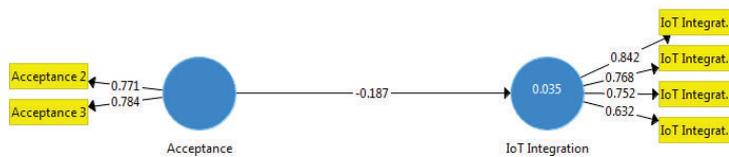
k) Advantages of adopting IoT agriculture sector.
 76.5% of respondents believed that lots of advantages can be achieved by adopting IoT in the agriculture sector

I believe there are lots of advantages of adopting IoT in agriculture sector. Saya percaya terdapat banyak kelebihan menggunakan IoT dalam sektor pertanian.
 132 responses



PLS Application of Structural Model

A correlation of -0.187 was produced by running the data using Partial Least Square (PLS) application. This shows that by integrating the IoT alone into the agriculture sector will not have a significant impact on influencing the acceptance of youth towards the agriculture sector.



Outer Loadings					
	Outer Loadings	AVE	CR	rho_A	VIF
Acceptance 2	0.771	0.604	0.753	0.345	1.046
Acceptance 3	0.784				1.046
IoT Integration 1	0.427	0.566	0.838	0.923	1.229
IoT Integration 2	0.768				2.837
IoT Integration 3	0.752				1.677
IoT Integration 4	0.632				2.284
Fornell Larcker					
		1	2		
Acceptance	0.777				
IoT Integration	-0.187	0.752			
HTMT					

	1	2			
Acceptance					
IoT Integration	0.281				
<u>Path Coeficient</u>					
	IoT Integration				
Acceptance	-0.187	# Negative relationship			
<u>R Square, f square for endogeneous variable</u>					
	R Square	f square (effect size)			
IoT Integration	0.035	0.036			
<u>Direct relationship</u>					
	Path Coeficient (Beta)	T-Value	P Values	Desicision	
Acceptance -> IoT Integration	-0.187	1.143	0.253	insignificant	

Discussion and Conclusion

Integrating IoT and automation into smart farming will introduce a better result as compared to the conventional method that is normally being practiced. The farm's operations would move towards green and sustainable practices. This smart system, it will provide assistance to the farmers in getting live data for efficient environment monitoring. All the data will be made available on the digital clouds and through IoT, can be used for live monitoring. The data on temperature and humidity will also be used to predict when is going to rain, hence the decision on whether to water the plant at a given time can be made. Similarly with the nutrient requirements; by installing the devices on the planting medium, the necessary number of fertilizers that are required can be determined. Since all this on-time data can be made available in the digital clouds, the farmers could control the system from a distance as long as the availability of internet connection. Furthermore, the availability of products such as the quantity and types of fresh produce can also be uploaded to the digital clouds for consumer information and ordering purposes.

Transformation of conventional ways to smart farming methods is necessary in making the agricultural sector to be more attractive and sustainable in nature. By adopting IoT to the system, smart farming can contribute significantly to the sustainability of land use, restoring and

maintaining soil erosion and limiting excessive inorganic chemical pollution. The usage of water can also be controlled in a very efficient manner. The opportunities available through smart farming will produce considerable benefits and hence, will contribute significantly to fulfilling the target being set in the 'Halatuj Sabah Maju Jaya' in developing the state's economy.

From the study, the correlation of -0.187 was produced by running the data using Partial Least Square (PLS) application. This shows that integrating the IoT alone into the agriculture sector will not have a significant impact on influencing the acceptance of youth towards the agriculture sector. Further study needs to be carried out on various variables such as resources available in monetary and facilities forms, urban agriculture, skill improvement, agropreneurship, and others. By combining these variables, a correct method of approach can be established, and hence would influence the acceptance of Sabah's youth towards the agriculture sector.

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