INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 16, Issue 11, (2026) E-ISSN: 2222-6990

The Acceptance of IoT Technology among Youth Agropreneurs in Sabah: Exploring the Influence of Resource Availability

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DOI Link: http://dx.doi.org/10.6007/IJARBSS/v16-i11/29337

Published Date: 18 November 2026

Abstract

The Internet of Things (IoT) is increasingly recognised as an enabling technology for digital and smart agriculture. Applications such as connected sensors, automated irrigation systems, environmental monitoring devices, and real-time data platforms can support agricultural monitoring, resource optimisation, and evidence-informed decision-making. Nevertheless, the potential benefits of IoT do not automatically result in its acceptance by agricultural entrepreneurs. In resource-constrained settings, acceptance may depend not only on users' perceptions of a technology but also on whether they can access the financial, infrastructural, and knowledge-based resources required to use it. This conceptual paper examines the acceptance of IoT technology among youth agropreneurs in Sabah, Malaysia, with particular emphasis on resource availability. Drawing on the Technology Acceptance Model (TAM) and the Resource-Based View (RBV), the paper proposes an integrated framework in which financial resources, technological infrastructure, and knowledge and technological skills are conceptualised as dimensions of resource availability. These resources are expected to influence IoT technology acceptance directly and indirectly through perceived usefulness and perceived ease of use. The paper develops seven research propositions to explain the proposed relationships. Its principal contribution is a contextual and theoretically integrated explanation that connects resource conditions with individual technology perceptions. The framework may guide future empirical research and inform policymakers, agricultural

development agencies, technology providers, and youth entrepreneurship programmes seeking to make digital agriculture more accessible to young agricultural entrepreneurs
Keywords: Internet of Things, Technology Acceptance, Resource Availability, Youth Agropreneurs, Digital Agriculture, Technology Acceptance Model, Resource-Based View

Introduction

Agriculture is undergoing a process of digital transformation in which data-driven technologies are increasingly used to support farming and agricultural business operations. The development of Agriculture 4.0 has brought together technologies such as the Internet of Things (IoT), artificial intelligence, cloud computing, big data analytics, and automation. These technologies can support more precise production processes, improve the efficiency of resource use, and strengthen the quality of operational decisions. However, the benefits that may arise from digitalisation depend on the ability of agricultural actors to access, understand, and use the technologies in their particular operating environments.

IoT is an important component of digital agriculture because it connects physical devices, sensors, and information systems so that data can be collected, transmitted, and analysed. In agricultural settings, IoT applications can be used to monitor soil moisture, temperature, weather conditions, irrigation systems, livestock, and other production-related conditions. The information generated can help farmers and agricultural entrepreneurs respond to changing conditions and make decisions based on timely data rather than relying exclusively on conventional observation and experience (Wolfert et al., 2017). Nevertheless, IoT implementation involves technical and organisational requirements that extend beyond purchasing a device, including connectivity, system compatibility, maintenance, and the ability to interpret data.

Youth agropreneurs are a relevant population for examining the opportunities and challenges associated with digital agriculture. As young individuals engaged in agricultural production, processing, distribution, and related business activities, they may contribute to innovation, business diversification, and the renewal of the agricultural workforce. Digital technologies can create opportunities for young entrepreneurs to improve production monitoring, manage inputs, and develop more responsive agricultural business models. However, age or general familiarity with digital applications should not be assumed to guarantee the knowledge, financial capacity, or infrastructure needed to use specialised IoT systems.

In Sabah, agricultural entrepreneurship takes place across communities with differing geographical, business, and infrastructure conditions. Youth agropreneurs may therefore experience different levels of access to reliable connectivity, electricity, technical assistance, and investment capital. These contextual conditions matter because IoT applications depend on functioning technological infrastructure and on users' ability to meet initial and ongoing costs. The acceptance of IoT among youth agropreneurs should consequently be considered in relation to both individual perceptions and the resources available to support use.

The literature on digital agriculture identifies several conditions that can facilitate or constrain technology adoption. Dibbern et al. (2024), through a bibliometric assessment and analysis of case studies, identify economic conditions, technological infrastructure, technical knowledge, and farmers' characteristics among the factors associated with digital agriculture adoption.

Bulut and Wu (2024) similarly synthesise research on agricultural IoT and identify cost, skills, standardisation, and connectivity as important barriers. These reviews establish that adoption is shaped by multiple interrelated conditions; however, they do not by themselves explain how specific resource dimensions relate to the behavioural perceptions described by TAM among youth agropreneurs in Sabah.

Evidence from other smallholder contexts reinforces the importance of examining both resources and user perceptions. Choruma et al. (2024) identify limited connectivity and low digital literacy as challenges to agricultural digitalisation among smallholder farmers in sub-Saharan Africa. Sen et al. (2024), using evidence from 937 farmers in Cambodia, the Philippines, and Vietnam, show that perceived usefulness and perceived behavioural control are associated with the uptake of digital extension services, while household wealth and perceived risks also matter. These studies provide useful evidence about digital agriculture and related services, but their populations, technologies, and theoretical emphases differ from the specific focus of the present paper: IoT acceptance among youth agropreneurs in Sabah.

A further point of reference is the study by Yaakub et al. (2025), which examines technology readiness, perceived usefulness, perceived ease of use, and entrepreneurial ambidexterity in relation to IoT adoption intention among small-scale farmers in Sabah. This study provides directly relevant local evidence about behavioural and readiness-related dimensions of agricultural IoT adoption. The present paper builds on that contribution but addresses a different conceptual emphasis: how the availability of financial resources, technological infrastructure, and knowledge may shape perceived usefulness, perceived ease of use, and IoT technology acceptance among youth agropreneurs. The distinction is important because small-scale farmers and youth agropreneurs may overlap, but they are not interchangeable populations, and adoption intention is not identical to the broader construct of technology acceptance.

Against this background, this conceptual paper proposes an integrated framework combining TAM and RBV. TAM explains how perceived usefulness and perceived ease of use contribute to technology acceptance (Davis, 1989), while RBV draws attention to the resources and capabilities that enable an individual or enterprise to pursue its activities (Barney, 1991). Integrating these perspectives provides a basis for examining how resource availability may shape behavioural perceptions and, in turn, acceptance of IoT technology among youth agropreneurs in Sabah.

Problem Statement

The IoT technology offers opportunities to improve agricultural operations through automation, real-time monitoring, precision farming, and data-informed decision-making. Yet, the availability of technological solutions does not necessarily lead to their acceptance or practical use. For youth agropreneurs, the decision to accept IoT may depend on whether the technology is perceived as useful and manageable, and whether the financial, infrastructural, and knowledge-based resources needed to access and operate it are available. The central problem addressed in this paper is therefore the need to explain IoT technology acceptance in a way that considers both behavioural perceptions and the resource conditions of young agricultural entrepreneurs.

Financial resources are one potential constraint. IoT implementation may involve the purchase of sensors, devices, connectivity equipment, software, installation, maintenance, and replacement. Youth agropreneurs operating micro or small agricultural businesses may have limited capital and may need to prioritise immediate operating expenses over investments in unfamiliar technologies. As a result, even when an entrepreneur recognises the potential usefulness of IoT, the cost of acquiring and maintaining the system may limit the ability or willingness to accept it. Financial capacity is therefore relevant not only to implementation after a decision has been made, but also to the formation of realistic perceptions about the feasibility and value of IoT.

Technological infrastructure is a second condition. IoT applications require reliable internet connectivity, electricity, compatible digital devices, communication networks, and access to technical support. In geographically dispersed agricultural communities, the reliability and affordability of these services may vary. A system that is technically useful may be perceived as difficult to use if connectivity is unstable, power supply is unreliable, or maintenance support is inaccessible. Infrastructure should therefore be considered as an enabling resource that affects whether IoT can be accessed and operated in the circumstances in which youth agropreneurs conduct their businesses.

Knowledge and technological skills form a third condition. General familiarity with smartphones, social media, or common digital applications does not necessarily equip an individual to configure IoT devices, interpret sensor-generated data, troubleshoot system problems, or apply digital information to agricultural decisions. Insufficient knowledge may increase the perceived complexity of IoT and reduce users' confidence in its practical value. Conversely, relevant training, digital literacy, and technical understanding may help youth agropreneurs assess the benefits of IoT and use its functions more effectively.

TAM, introduced by Davis (1989), explains technology acceptance primarily through perceived usefulness and perceived ease of use. These constructs are valuable for understanding why individuals form favourable or unfavourable evaluations of a technology. However, TAM does not, in its original form, specify financial resources, technological infrastructure, and knowledge as the central resource conditions that may enable or constrain technology use. Consequently, a TAM-only explanation may not fully capture the circumstances of youth agropreneurs whose perceptions and decisions are formed in settings where access to resources is uneven.

RBV offers a complementary perspective by emphasising the role of resources and capabilities in supporting organisational performance and competitive advantage (Barney, 1991). In the present context, financial resources, technological infrastructure, and knowledge are treated as enabling resources relevant to the ability of youth agropreneurs to engage with IoT. Nevertheless, RBV was developed to explain the strategic value of firm resources; on its own, it does not explain the individual-level perceptual processes through which users evaluate and accept a technology. The two perspectives therefore address related but distinct aspects of the problem: RBV draws attention to resource conditions, whereas TAM explains behavioural perceptions of technology.

The empirical literature further clarifies what is known and what remains to be explained. Dibbern et al. (2024) identify economic conditions, infrastructure, and technical knowledge as recurring drivers and barriers in digital agriculture. Bulut and Wu (2024), in a systematic review of research on IoT in agriculture, identify cost, skills, standardisation, and connectivity as major adoption barriers and point to the need for greater attention to the business layer of IoT systems. Choruma et al. (2024) similarly highlight connectivity and digital literacy challenges among smallholder farmers in sub-Saharan Africa. These studies demonstrate that resource-related conditions matter, but they examine broad digital agriculture or smallholder settings and do not establish an integrated TAM–RBV explanation focused on youth agropreneurs in Sabah.

Studies of digital services also show that behavioural perceptions and enabling conditions operate together. Sen et al. (2024) report that perceived usefulness and perceived behavioural control are positively associated with the uptake of digital extension services among farmers in Cambodia, the Philippines, and Vietnam, while household wealth and perceived risks also contribute to adoption patterns. Although digital extension services are not equivalent to IoT systems, this evidence indicates that technology-related behaviour should be interpreted in relation to both perceptions and users' circumstances. More specifically, Yaakub et al. (2025) examine technology readiness, TAM-related perceptions, and entrepreneurial ambidexterity in relation to IoT adoption intention among small-scale farmers in Sabah. Their work provides local empirical evidence on readiness and behavioural acceptance, while the present paper focuses on the conceptual role of financial resources, technological infrastructure, and knowledge as dimensions of resource availability among youth agropreneurs.

The critical review identifies three connected gaps. First, an empirical and population gap remains in the specific focus on youth agropreneurs: existing Sabah-based IoT evidence identified here concerns small-scale farmers and examines readiness, acceptance, entrepreneurial ambidexterity, and adoption intention, rather than the proposed resource-availability focus among youth agropreneurs. Second, a theoretical gap concerns the complementary but distinct explanatory roles of TAM and RBV. TAM explains perceived usefulness and perceived ease of use, while RBV explains the importance of resources and capabilities; the present paper brings these perspectives together to explain how resource conditions may shape behavioural perceptions and acceptance. Third, a **contextual and conceptual gap** concerns the need to examine financial resources, technological infrastructure, and knowledge together as dimensions of resource availability in the geographically and economically varied agricultural setting of Sabah. These gaps are not claims that no prior research exists; rather, they identify what the cited studies have addressed and the specific relationship that the proposed framework seeks to clarify.

Accordingly, this paper proposes an integrated TAM–RBV framework to explain how resource availability may influence IoT technology acceptance among youth agropreneurs in Sabah. The framework positions financial resources, technological infrastructure, and knowledge and technological skills as dimensions of resource availability, and proposes that this construct may influence acceptance directly and indirectly through perceived usefulness and perceived ease of use. In doing so, the paper seeks to extend discussion beyond whether users view IoT

as useful or easy to use, towards consideration of whether they have the resources required to access and engage with the technology.

Research Objectives

This conceptual paper is guided by the following objectives:

1. To examine how resource availability, comprising financial resources, technological infrastructure, and knowledge and technological skills, may influence IoT technology acceptance among youth agropreneurs in Sabah
2. To explain the proposed roles of perceived usefulness and perceived ease of use in the relationship between resource availability and IoT technology acceptance.
3. To develop an integrated TAM–RBV conceptual framework for explaining IoT technology acceptance among youth agropreneurs in Sabah.

Research Questions

The following research questions are proposed:

1. How may resource availability influence IoT technology acceptance among youth agropreneurs in Sabah?
2. What roles may perceived usefulness and perceived ease of use play in the relationship between resource availability and IoT technology acceptance?
3. How can the integration of TAM and RBV provide a conceptual explanation of IoT technology acceptance among youth agropreneurs in Sabah?

Literature Review

The Internet of Things refers to interconnected physical objects equipped with sensors, software, and communication capabilities that enable the collection and exchange of data. In agriculture, IoT links physical farming conditions with digital information systems, allowing users to monitor production environments and manage selected operations using information generated by connected devices.

Applications include monitoring soil moisture and temperature, tracking weather and crop conditions, controlling irrigation, and monitoring livestock or equipment. Such applications can provide timely information for operational decisions and support more precise use of agricultural inputs. Wolfert et al. (2017) discuss how big data and smart farming can transform agricultural production and decision-making, while the practical value of these systems depends on the quality, availability, and interpretation of the data they generate.

The existence of IoT devices is not sufficient to ensure adoption. Users may also need to finance equipment and subscriptions, obtain reliable connectivity, maintain devices, and develop the skills required to operate and interpret the system. These requirements mean that the adoption of IoT is partly a resource issue and partly a question of how potential users evaluate the technology.

Bulut and Wu (2024) provide a systematic review of research on IoT in agriculture and identify cost, skills, and standardisation as major barriers, alongside connectivity and data-governance challenges. Dibbern et al. (2024) likewise identify economic conditions, infrastructure, technical knowledge, age, and organisational characteristics among the factors associated with digital agriculture adoption. The convergence of these reviews supports the relevance of

resource availability, while also showing that adoption is multi-dimensional and context dependent.

Choruma et al. (2024) focus on digitalisation among smallholder farmers in sub-Saharan Africa and highlight limited connectivity and low digital literacy as barriers to wider use. Sen et al. (2024), by contrast, examine digital extension services in Cambodia, the Philippines, and Vietnam and show that behavioural factors such as perceived usefulness and perceived behavioural control are associated with uptake, alongside household wealth and perceived risks. These studies are informative but should not be treated as direct evidence about IoT acceptance among youth agropreneurs in Sabah: digital extension services encompass a different range of technologies, and the geographical and population contexts differ.

Taken together, the literature suggests that IoT acceptance in agriculture cannot be explained exclusively by the technical features of devices or by individual attitudes. The availability of finance, infrastructure, and knowledge may shape whether users can access the technology and whether they regard it as useful and manageable. This paper therefore treats resource availability as a central construct in the proposed framework.

For youth agropreneurs, IoT may support production monitoring, more efficient input management, and evidence-informed business decisions. However, the ability to benefit from these applications may depend on the scale and financial capacity of the enterprise, the infrastructure available at the production site, and the entrepreneur's technical knowledge. These considerations provide the basis for examining youth agropreneurship as a distinct context for IoT technology acceptance.

Youth Agropreneurs and Digital Agricultural Entrepreneurship

Youth agropreneurs are young people engaged in agricultural production, processing, distribution, or other agriculture-related entrepreneurial activities. Their participation can contribute to innovation, employment creation, and the development of agricultural value chains. In this paper, the term refers to young entrepreneurs involved in agricultural business activities, rather than all young people who use digital technologies.

Digital technologies may enable youth agropreneurs to improve business processes, monitor agricultural conditions, and explore new products or services. IoT applications can support precision farming, crop monitoring, irrigation management, and the coordination of selected operational activities. However, the decision to accept these applications may involve an assessment of expected benefits, perceived complexity, investment requirements, and the availability of relevant skills and infrastructure.

In Sabah, youth agropreneurship takes place across communities that may differ in location, enterprise scale, connectivity, and access to support services. Such variation provides a relevant context for considering resource availability. It also cautions against assuming that all youth agropreneurs have equivalent opportunities to access and use IoT systems.

Accordingly, the acceptance of IoT among youth agropreneurs should be understood as a process shaped by both individual evaluations of technology and the resource conditions of

their agricultural businesses. This perspective informs the integration of TAM and RBV developed in this paper.

Technology Acceptance Model (TAM)

Perceived Usefulness (PU)

Perceived usefulness refers to the extent to which an individual believes that using a particular technology will enhance performance or produce valued outcomes (Davis, 1989). In agricultural entrepreneurship, perceived usefulness concerns the extent to which youth agropreneurs believe that IoT applications can improve productivity, reduce operational inefficiencies, strengthen monitoring, optimise resource use, or support business decisions. For example, an agropreneur may regard an IoT-enabled irrigation system as useful if soil-moisture data and automated controls help manage water use more effectively or reduce the need for continuous manual monitoring. The perceived benefit will nevertheless depend on whether the system is appropriate for the enterprise and its operating conditions.

Perceived Ease of Use (PEOU)

Perceived ease of use refers to the extent to which an individual believes that using a particular technology will be free of substantial effort (Davis, 1989).

In IoT-based agriculture, perceived ease of use concerns whether youth agropreneurs believe that devices and applications can be understood, installed, operated, and maintained without excessive difficulty. System design, the clarity of interfaces, compatibility, and access to assistance may shape this perception.

For instance, clear instructions, straightforward installation, understandable data displays, and appropriate technical training may reduce the effort users associate with IoT applications. Perceived ease of use is therefore a user perception, while the knowledge and training that may help form that perception are treated separately as resource-related conditions in the proposed framework.

TAM proposes that perceived usefulness and perceived ease of use are central to technology acceptance, and that perceived ease of use can also contribute to perceived usefulness (Davis, 1989; Venkatesh & Davis, 2000). In agricultural entrepreneurship, however, users' perceptions may be shaped by whether they have the resources needed to access and operate the technology. The present framework therefore places resource availability alongside the two TAM perceptions.

In this paper, resource availability is conceptualised through three dimensions: financial resources, technological infrastructure, and knowledge and technological skills.

a) Financial Resources

Financial resources refer to the funds and financial capacity available to acquire, install, operate, maintain, and update IoT applications. Relevant costs may include sensors, devices, software, connectivity subscriptions, installation, repairs, and replacement. For youth agropreneurs with limited business capital, these expenses may affect whether IoT is considered affordable and feasible. Financial resources are therefore an enabling condition for access to technology and for sustaining its use over time.

b) Technological Infrastructure

Technological infrastructure refers to the physical and digital facilities required for IoT applications to function. These may include reliable internet connectivity, electricity, compatible devices, communication networks, and access to technical support. Where connectivity or power supply is unreliable, the operation of connected devices may be interrupted and the perceived effort of using IoT may increase. Adequate infrastructure is therefore an essential enabling resource for technology access and use.

c) Knowledge and Technological Skills

Knowledge and technological skills refer to the understanding and competencies required to operate IoT systems, interpret the information they generate, undertake basic troubleshooting, and apply digital information to agricultural decisions. These capabilities may be developed through education, practical experience, training, and technical guidance. Sufficient knowledge may help users understand the functions and benefits of IoT and feel more capable of operating it. In this framework, knowledge and skills are treated as resources, whereas perceived ease of use remains a separate TAM construct reflecting the user's evaluation of the effort required.

The three dimensions are supported by related empirical and review literature. Dibbern et al. (2024) identify economic conditions, technological infrastructure, and technical knowledge as interconnected drivers and barriers to digital agriculture adoption. Bulut and Wu (2024) highlight cost, skills, standardisation, and connectivity as recurring barriers to agricultural IoT. Sen et al. (2024) further demonstrate, in the context of digital extension services, that household wealth and behavioural perceptions are relevant to uptake, while Choruma et al. (2024) emphasise connectivity and digital literacy challenges among smallholder farmers. Although these studies examine different populations and technologies, together they support the analytical relevance of financial, infrastructural, and knowledge-based resources. The present paper consequently conceptualises resource availability as a multidimensional enabling condition rather than as a single undifferentiated factor. Financial resources may support acquisition and maintenance; technological infrastructure may enable reliable operation; and knowledge and technological skills may enable users to understand and apply the system. These dimensions are proposed to shape perceived usefulness and perceived ease of use and may also have a direct relationship with IoT technology acceptance.

Theoretical Foundation and Integration

Integration of TAM and RBV

This paper integrates TAM and RBV to explain IoT technology acceptance among youth agropreneurs. TAM focuses on individual perceptions, particularly perceived usefulness and perceived ease of use, that help explain acceptance of a technology (Davis, 1989). RBV emphasises the importance of resources and capabilities in enabling an organisation to pursue its objectives and sustain performance (Barney, 1991). The theories therefore address complementary levels of explanation: TAM describes how users evaluate a technology, while RBV directs attention to the resources that may make engagement with that technology possible.

Within the proposed framework, financial resources, technological infrastructure, and knowledge and technological skills form the resource-availability construct. These resources

may shape perceived usefulness by enabling youth agropreneurs to access and experience the operational benefits of IoT. They may also shape perceived ease of use: reliable infrastructure can reduce technical interruptions, while knowledge and skills can help users understand and operate the system. Financial capacity may further enable access to training, technical assistance, and appropriate equipment. These relationships are conceptual propositions and require empirical testing in the target population.

The framework proposes both direct and indirect relationships. The direct path represents the possibility that resource availability provides the practical conditions necessary for accepting IoT, beyond users' evaluations of usefulness and ease of use. The indirect paths propose that resource availability may influence acceptance by shaping perceived usefulness and perceived ease of use. In addition, consistent with TAM, perceived ease of use is proposed to influence perceived usefulness (Davis, 1989; Venkatesh & Davis, 2000).

Proposed Conceptual Research Framework

The proposed framework comprises one multidimensional independent construct, two mediating constructs, and one dependent construct. Resource Availability is the independent construct and comprises financial resources, technological infrastructure, and knowledge and technological skills. Perceived Usefulness and Perceived Ease of Use are the mediating constructs drawn from TAM. Acceptance of IoT Technology is the dependent construct and refers to youth agropreneurs' favourable evaluation and willingness to accept and use IoT applications in their agricultural business activities.

The framework proposes that resource availability influences perceived usefulness and perceived ease of use. Both TAM constructs are expected to contribute to IoT technology acceptance, while perceived ease of use is also expected to influence perceived usefulness. A direct path from resource availability to IoT technology acceptance is included to recognise that access to essential resources may matter beyond the two perceptual mechanisms

Technology Acceptance Model (TAM)

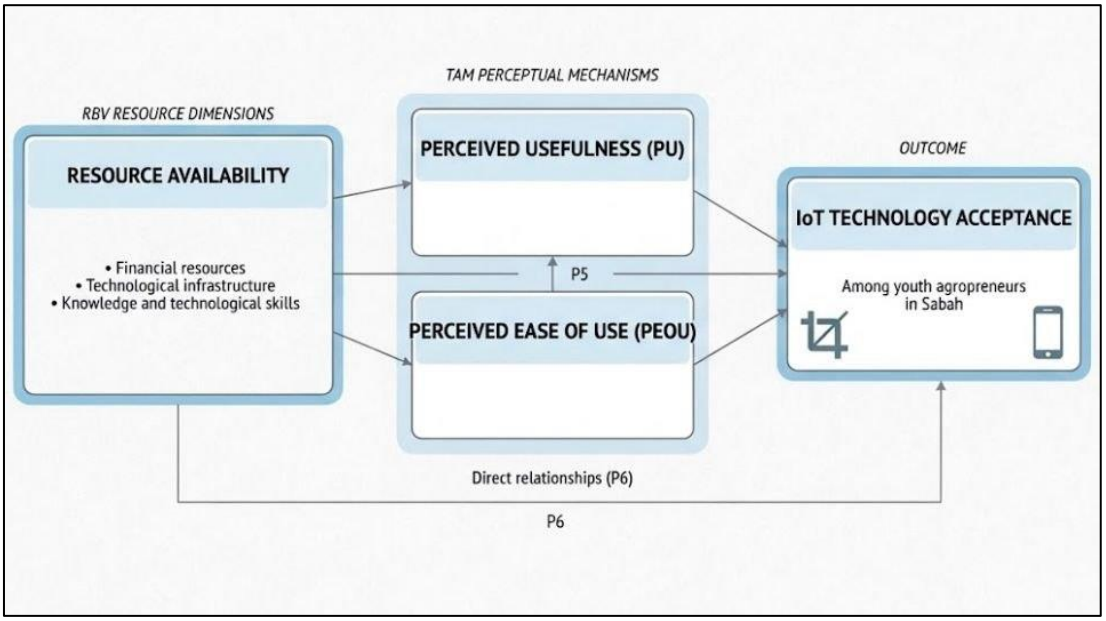

Figure 1 Proposed TAM–RBV conceptual framework for IoT technology acceptance among youth agropreneurs in Sabah.

The framework presents the proposed relationships among resource availability, the two TAM perceptions, and IoT technology acceptance. It is intended as a conceptual model to guide future empirical investigation rather than as a report of tested causal effects.

Development of Research Propositions

Proposition 1: Resource Availability and Perceived Usefulness

Adequate resources may influence how youth agropreneurs evaluate the benefits of IoT. Financial resources can make it possible to obtain suitable devices and supporting services; infrastructure can enable the technology to function in the business environment; and knowledge and technical skills can help users understand how IoT may improve agricultural operations. When these resources are accessible, users may be better positioned to recognise the practical value of IoT. This reasoning is consistent with the resource-related adoption factors identified by Dibbern et al. (2024) and Bulut and Wu (2024).

P1: Resource availability positively influences the perceived usefulness of IoT technology among youth agropreneurs.

Proposition 2: Resource Availability and Perceived Ease of Use

Resource availability may also affect the effort users expect to invest in operating IoT. Reliable infrastructure can reduce interruptions and technical difficulties, while knowledge and training can help users understand system functions and perform basic operations. Financial resources may facilitate access to suitable equipment, installation, and technical assistance. These conditions may make IoT applications appear easier to use.

P2: Resource availability positively influences the perceived ease of use of IoT technology among youth agropreneurs.

Proposition 3: Perceived Usefulness and IoT Technology Acceptance

Within TAM, perceived usefulness is a key determinant of technology acceptance (Davis, 1989). Youth agropreneurs who believe that IoT can improve monitoring, resource management, productivity, or business decisions may be more favourably disposed towards accepting the technology. The relevance of perceived usefulness to agricultural digital-service uptake is also reflected in the findings of Sen et al. (2024), although their study examines digital extension services rather than IoT systems.

P3: Perceived usefulness positively influences IoT technology acceptance among youth agropreneurs.

Proposition 4: Perceived Ease of Use and IoT Technology Acceptance

When users believe that IoT applications are understandable and can be operated without excessive effort, the perceived burden of using the technology may be reduced. Clear interfaces, manageable operating procedures, and confidence in carrying out basic tasks may therefore support a more favourable acceptance decision. This proposition follows the role assigned to perceived ease of use in TAM (Davis, 1989).

P4: Perceived ease of use positively influences IoT technology acceptance among youth agropreneurs.

Proposition 5: Perceived Ease of Use and Perceived Usefulness

TAM also proposes a relationship between perceived ease of use and perceived usefulness. When a system is easier to understand and operate, users may be better able to realise its functional benefits because less effort is required to engage with its features (Davis, 1989; Venkatesh & Davis, 2000). In agricultural businesses, an IoT system that is perceived as manageable may therefore be more readily evaluated as useful for monitoring and operational decision-making.

P5: Perceived ease of use positively influences perceived usefulness of IoT technology among youth agropreneurs.

Proposition 6: Resource Availability and IoT Technology Acceptance

Resource availability may influence acceptance directly because access to finance, infrastructure, and knowledge can determine whether IoT is a feasible option for an agricultural business. Even where perceived usefulness and perceived ease of use are favourable, insufficient resources may prevent an entrepreneur from accepting or committing to the technology. Conversely, the availability of essential resources may make acceptance more practicable. This direct relationship complements the indirect perceptual paths proposed in the framework.

P6: Resource availability positively influences IoT technology acceptance among youth agropreneurs.

Proposition 7: The Mediating Role of TAM Constructs

The framework further proposes that perceived usefulness and perceived ease of use may explain part of the relationship between resource availability and IoT technology acceptance. Access to financial resources, infrastructure, and knowledge may improve users' evaluation of the benefits and operational demands of IoT. These perceptions may then contribute to acceptance. The mediating role of each TAM construct is therefore proposed as a mechanism through which resource conditions may be associated with acceptance.

P7a: Perceived usefulness mediates the relationship between resource availability and IoT technology acceptance.

P7b: Perceived ease of use mediates the relationship between resource availability and IoT technology acceptance.

Theoretical and Practical Implications

Theoretical Implications

This conceptual paper contributes to the literature by bringing together TAM and RBV to explain IoT technology acceptance in agricultural entrepreneurship. Its contribution is not to claim that either theory is insufficient in general, but to show how their complementary emphases can be used to frame a resource-sensitive explanation of acceptance among youth agropreneurs.

First, the framework extends the application of TAM in this context by explicitly considering resource availability as an external condition that may shape perceived usefulness and perceived ease of use. This recognises that favourable perceptions may be difficult to form or translate into acceptance when users cannot access the required technology, infrastructure, or knowledge.

Second, the framework applies the resource-oriented logic of RBV to the study of technology acceptance by identifying financial resources, technological infrastructure, and knowledge and technological skills as distinct dimensions. It connects these enabling conditions with individual-level perceptions rather than treating resources and behavioural acceptance as separate discussions.

Third, the paper provides a context-specific conceptual focus on youth agropreneurs in Sabah. It builds on local evidence concerning IoT readiness and acceptance among small-scale farmers (Yaakub et al., 2025), while directing attention to the resource conditions that may be particularly relevant to young agricultural entrepreneurs. The proposed relationships remain to be tested empirically.

Practical Implications

The proposed framework has implications for stakeholders involved in agricultural development and youth entrepreneurship. These implications are conceptual and indicate areas where future programmes and empirical studies may focus.

Agricultural policymakers:

Agricultural policymakers may consider targeted financing, grants, or subsidy arrangements that help youth agropreneurs meet the initial and recurring costs of suitable IoT equipment and services.

Agricultural development agencies

Agricultural development agencies may strengthen practical digital-agriculture training, demonstrations, and extension programmes so that young entrepreneurs can develop the knowledge and technical skills needed to operate and interpret IoT systems.

Technology providers

Technology providers may develop affordable, reliable, user-friendly, and locally appropriate IoT solutions that reflect the connectivity conditions, enterprise scale, and operational needs of small agricultural businesses.

Youth entrepreneurship development programmes

Youth entrepreneurship programmes may incorporate digital-agriculture competencies, hands-on IoT demonstrations, and business planning for technology investment to help young entrepreneurs assess the suitability and cost implications of adopting IoT.

Rural infrastructure stakeholders

Stakeholders responsible for rural infrastructure may consider the importance of reliable connectivity, electricity, and supporting digital services for the practical operation of IoT applications in agricultural communities.

Taken together, these implications suggest that efforts to encourage IoT acceptance should combine awareness and skills development with practical attention to affordability and infrastructure. Such an approach may help ensure that digital agriculture initiatives are relevant to the operating conditions of youth agropreneurs across Sabah.

Conclusion

This conceptual paper examines the acceptance of IoT technology among youth agropreneurs in Sabah through an integrated TAM–RBV perspective. The proposed framework identifies financial resources, technological infrastructure, and knowledge and technological skills as dimensions of resource availability. It further proposes that resource availability may influence IoT technology acceptance directly and indirectly through perceived usefulness and perceived ease of use, while perceived ease of use may also contribute to perceived usefulness.

The paper addresses an identified conceptual need by connecting the resource conditions highlighted in digital agriculture research with the behavioural perceptions explained by TAM. Its contribution is a framework that is specific to youth agropreneurship in Sabah and that can guide subsequent empirical testing. As a conceptual paper, it does not establish the strength or statistical significance of the proposed relationships. Future research should operationalise the three resource dimensions and the TAM constructs, collect evidence from youth agropreneurs across different agricultural settings in Sabah, and test the proposed direct and mediating relationships. Such work would help determine whether the framework adequately explains IoT technology acceptance and how programmes can address the resource conditions that constrain it.

Funding Statement

This research was supported by the Newly Appointed Lecturer Research Scheme (SPLB).

Acknowledgement

The authors also gratefully acknowledge Universiti Malaysia Sabah (UMS) for the financial support provided through the Newly Appointed Lecturer Research Scheme (SPLB), which made this study possible.

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