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Success Factors of Agribusiness Digital Market Places in Tanzania, the case of selected agribusiness firms participating in DMP in Tanzania

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Abstract
This research paper explores the underutilized digital market potential in the agribusiness sector of Tanzania, contrasting it with the global prevalence of such platforms in other countries. The study delves into the factors contributing to the limited adoption of digital marketplaces in Tanzania, highlighting the lack of awareness and financial constraints as major impediments. The The research aimed to identify the key success factors for agribusiness digital marketplaces in Tanzania. It specifically investigates the impact of technological competence, financial commitment, industrialization policies, and organizational e-readiness on the adoption of digital marketplaces. To accomplish this, the study employed a quantitative research design, surveying 200 agribusiness firms across seven regions of Tanzania. The findings revealed a readiness among Tanzanian agribusinesses to embrace digital information technology due to its potential in reducing information asymmetry, transactional costs, and facilitating demand-supply matching. However, the study also identifies a lack of government support and incentives to promote digital solutions in the agribusiness supply chain in Tanzania. The research underlines that the success of agribusiness digital markets is heavily influenced by technological competence, financial commitment, and organizational e-readiness. Greater financial commitment leads to higher technological competence, enabling firms to leverage digital technologies for production and marketing. The paper recommends various initiatives to promote the widespread adoption of digital marketing technologies in Tanzania's agribusiness sector. Government agencies, policymakers, development institutions, BDS providers, financial service institutions, and the ICT industry should collaborate to make digital marketplaces economically appealing to key stakeholders, including agro-processors, farmers, input suppliers, logistics companies, traders, and consumers. This collaborative effort is vital for enhancing the applicability and usage of digital marketplaces in Tanzania's agribusiness sector.
Keywords: Digital Market Places, Success factors, Agri business firms

1. Introduction
Digital marketplaces (DMPs) are market institutions that employ digital information technology such as computers, the Internet, and the World Wide Web to reduce transaction costs and provide trading services to buyers and sellers (Clasen and Mueller 2006). An increasing number of agribusinesses are looking to the Internet as a marketing, management, service, and coordination tool (Kumar, Sowdhamini and Virupaksh, 2021). As a business tool, the Internet has proven to be an enamouring concept for many individuals and corporations (Molla and Licker 2005). Agribusinesses possess a history of quick adoption and assimilation of new technologies, especially cost reduction technologies (Montealegre, Thompson, and Eales 2004). Internet technology has provided the possibility for cost reduction and demand enhancement along the food supply chain by using e-commerce (Yiwu Zeng et al., 2017). Agribusiness DMPs can improve the firm's efficiency by reducing inventory levels, transportation costs, and order and delivery time. Digital markets are expected to be more transparent and more competitive than physical markets; conditions which attract more consumers and thus increase demand for agricultural products (Clasen and Mueller 2006).

A big issue in Tanzania, and indeed the rest of East Africa is connecting agricultural buyers and sellers (URT 2016). The fact that produce goes bad because it cannot find a buyer is a real problem regarding the incomes that farmers can receive. Agro-processors also face the problem of limited supply of inputs, which may translate to idle capacity or inefficiency, resulting in limited growth of their businesses and high costs of production. High production costs of processed agro-products translate to high price, which is born by consumers, hence decreased savings or inability to consume the products. There's a significant discrepancy between what is produced, and what reaches the market; much produce is going off as it cannot find a buyer or is being processed to a more final product (URT 2017). On the other hand, it takes much time for the farmers' produce or the products of small/medium agro-processors to reach the physical markets or traders as these key players (farmers, processors, and traders) have limited information on the timing and availability of shared transport in their localities. It has also been observed that key players (agro-processors, farmers, inputs suppliers, logistics and transport companies, traders, consumers) along the agribusiness value/supply chain face the challenge of accessing the appropriate services from government agencies and development institutions to foster their performance and investment in digital technologies (such as internet, display advertising, mobile phones) for marketing of products or services.

Therefore, there is a need to bridge the gap between food supply and consumer demand by enhancing marketplaces that digitize Tanzania's agricultural sector. The presence of DMPs is increasingly seen as a necessity to agribusiness existence. Benefits are expressed as garnering more customers, increasing public awareness of agricultural and food products, promoting strategic or policy-related positions, and selling more products (Clasen and Mueller 2006). Initiatives on the enhancement of digital marketing access to farmers are acknowledged, but they do not focus on the agribusiness value/supply chain focusing on micro, small, and medium firms. They also ignore the role of government, as well as the establishment of agribusiness online trading platform, the utilization of which could lead to more innovation and improvement in policies related to agribusiness development. Therefore, the research paper aimed at analysing the success factors of agribusiness DMPs in Tanzania; taking the case of selected agribusiness firms participating in DMPs in Tanzania.

Based on the theory of diffusion of innovation by Rogers (Mvogo, Ndzana and Bidiasse, 2022) the firm's technological capability plays a vital role in the success of agribusiness DMPs. Agribusiness firms that participate in DMPs are likely to flourish when firm accumulation of the number of e-business and e-enabling technologies relevant in the agribusiness supply chain is available and used in business operations (Molla et al., 2014). Moreover, there is evidence from other authors which explain that agribusiness firms that invest in farm automation technologies can provide real-time information in pre-harvest maturity monitoring, ripeness determination, and postharvest treatment of agricultural products (Molla, 2014). Internet technologies; e-supply chain technologies; and mobile technologies such as broadband, websites, electronic document interchange, bar-coding, and short messaging services are essential tools to facilitate accurate ordering; delivery; invoicing; and sharing another agri-business information, which is essential for firm profitability (Bryceson 2006; Trevarthen 2007). Thus, it is equally important to analyze the influence of firm technological competence towards the success of agribusiness DMPs in Tanzania. Moreover, the consideration of the firm's financial commitment to invest in digital information technology when analyzing the success of agribusiness DMPs is also essential.

Apart from the firm's technological competence and financial commitment, previous studies emphasize the role of perceived organizational e-readiness (Mueller 2001; Hung, Chang, Lin, & Hsiao, 2014) and government provided incentives (Pollard 2003; Molla et al., 2014)) in promoting the success of agribusiness DMPs. This conclusion is based on research done in developed countries such as Australia, USA and China which in no small extent differs from Tanzania regarding the development of agribusiness DMPs. Lessons from the world-leading countries in agribusiness DMPs are not entirely transferable to Tanzania, due to differences in demographics like land size, population, density, income, and the nature of e-business and digital information usage as well as differences in the level of adoption of digital information technologies for the marketing of agricultural products or services. Therefore, it was important for this study to analyze

the perceived organizational e-readiness and the provision of government incentives for the use of digital information technologies in the agribusiness supply chain and their contribution to the success of agribusiness DMPs in Tanzania.

Policy Implication/Contribution to Policy

The recent introduction of DMPs has brought a positive turn in Tanzania agribusiness that is through organizations such as The Southern Agricultural Growth Corridor of Tanzania (SAGGOT), The Agribusiness Innovation Center (AIC), and Hello Food (Abotsi, 2015). Furthermore, Tanzania has made several policies and strategies since its independence regarding agriculture such as the Politics is Agriculture of 1974, Life and Death Effort to Improve Agriculture of 1974/75, Arusha Declaration of 1967, and National Agricultural Policy of 1983 among others. Nevertheless, The Tanzania policy of Kilimo Kwanza which was introduced by the former Hon. Jakaya Kikwete was well received by Tanzanians, and among its implementation plans included the use of modern science and technology to increase revenue from agribusiness in Tanzania (Ngaiza 2012). In Tanzania, the digital marketing concept has been well received because of the implementation strategy of Kilimo Kwanza. The strategy included teamwork by all farmers, financing farmers by introducing TADB (Tanzania Agricultural Development Bank), good governance, promoting local producers by consuming what we produce and producing what we consume, attracting investments on the development of ICT infrastructure, industrialization policy, promoting the use of modern technology, developing infrastructure, and involving both the private and public sector in agribusiness (Ngaiza 2012). Also, different stakeholders are interested in the wider adoption of digital information technologies to facilitate the exchange of agricultural trading information in real time; Adella, Hepelwa, Yami and Manyong (2020) explained that, the government of Tanzania through the industrialization of agriculture has set up management practices aimed at creating best digital solutions to reduce costs and increase value with partners in the agribusiness supply chain. In conjunction with government policies and strategies, this research provided the avenue for understanding the means to promote public awareness and acceptance of the use of agribusiness DMPs.

The Contribution of the paper to the Field of Youth Engagement in Agribusiness and Rural Economic Activities in Africa

Agribusiness if fully optimized can deal with the issue of food security. Our agricultural capacity must be utilized for us to achieve this. In the rural areas of Tanzania, agriculture is best placed to tackle poverty. However, young agro-entrepreneurs face many challenges including access to financial and capacity development resources. This, unfortunately, drives the young to migrate to urban centers whereby reducing the number of youths who can farm and engage in the food supply chain. This creates a bigger problem in urban areas, creating a dependent society and degrades the infrastructure of the urban areas which are poorly planned. Promoting agribusiness DMPs in rural areas will help keep young people rooted at home and create opportunities for them. However, Tanzania, being among emerging economy nations, allows risk-takers to make enormous profit and among the sectors that is worth risking is agriculture because Tanzania is blessed with good soil, rivers, and a vast number of cheap labourers. Instead of the youth waiting to be employed, it is best for them to employ themselves in agribusiness to increase government revenue, expand knowledge, and make better use of subsidies and exemptions that are given to farmers in Tanzania. This will go a long way to address unemployment in Tanzania. Therefore, in-depth research findings from this study will promote the application of information technology in entrepreneurship and agribusiness development planning and management, to build on capacity development professionals who are actively engaged in the agribusiness digital market opportunities and food security activities in governmental and nongovernmental organizations in Tanzania.

2. Literature review

2.1 The Potential of a Digital Market in the Tanzania Agribusiness Sector

There are many ways in which digital marketplace services can support agricultural development and improve the livelihoods of the agriculture-dependent community in Tanzania. This is significant because

digital marketing penetration can provide affordable ways for millions of people living in rural areas to access information such as markets, finance, crops status, and governance system (Ngowi, 2015).

Recently, the uses of digital marketing in agribusinesses in Tanzania have been mostly handled based on the instinct and knowledge of experienced farmers, agribusiness owners, and managers. There is no systematic approach to optimize available technologies such as smartphones and apps, aimed at managing and analyzing agribusiness operations, transactions, and projects (URT 2017). Although agribusiness firms have been keeping records on paper to manage business transactions, operations, and projects, the role of digital market-based technologies such as mobile phone applications, online live chats, online shops, and display advertising could reduce the managing burden and enable the implementation of better access to information between buyers, agribusinesses, and rural farmers about market status.

Over the past decade, the use of mobile phones has been growing fast in Tanzania, according to the Tanzania Communication Regulatory Authority (TCRA): "*The number of subscriptions in terms of the figure increased from 3 million subscribers in 2000 to 15 million in 2009. Moreover, in the mid of 2013, the number of subscribers already reached 26 million*"

Despite all these good figures of mobile users, much has been grasped yet nothing has been done to eliminate the challenges facing the small-scale agriculture sector in Tanzania. While other stakeholders such as policymakers, researchers, agricultural officers, supporters (business development services (BDS) providers, financial institutions, telecommunication companies) and facilitators (government agencies and development institutions) are available in each region, there is no digital platform which could implement a suitable business environment to integrate them with agro-processors, farmers, input suppliers, logistics and transport companies, traders, and buyers. Therefore, this initiative will open doors for the younger generation to be leaders in introducing and scaling new digital information technologies into Tanzania agricultural systems which have the potential to empower rural farmers to market their products more effectively.

2.2 Theoretical Framework

2.2.1 Technological Perspective Frameworks and the Theory of Diffusion of Innovation.

The technological perspective frameworks address the technological determinants of the adoption and diffusion of innovation in the agribusiness supply chain (Molla et al., 2014). The theory of diffusion of innovation by Rogers (2003) focuses on the perceived characteristics of an innovation such as relative advantage, complexity, compatibility, and observability (Weerasinghe, 2009). According to this theory, the rate of adoption of innovation is mostly influenced by the way consumers perceive the new technology; this perception is based on different attributes of the innovation which are a relative advantage, observability, compatibility, trialability, and complexity (Potluri and Rao, 2021). Based on this theory, the agribusiness firms will adopt the digital information technology when the relative advantage, compatibility, trialability, and observability attributes are perceived as higher and when the complexity attribute is perceived as lower than those of the existing technology (physical markets).

For this study, the theory of diffusion of innovation was used to explain the influence of the firm's technological competence towards the success of agribusiness DMPs. DMPs are likely to flourish when agribusiness firms have developed technological capability (Molla et al., 2014) by investing and using a number of enabling and digital technologies that digitize their value chain processes and functions.

2.2.2 Managerial Innovation Models

Managerial perspective addresses the managerial innovation models which suggest that the adoption of digital market technologies depends on managers' awareness of the problems and organizational culture that encourage risk taking (Molla et al., 2014). For this study, a firm's possession of adequate resources to access and use the internet in business transactions and operations, in addition to technical and managerial capability as suggested by Molla et al (2014) was considered to be advantageous in assessing the readiness of the organization to use digital information technologies for implementing, building, and developing sustained DMPs for their business practices.

2.2.3 The Organizational-Technology-Environment Framework (OTE)

The organizational-technology-environment framework (OTE) by Molla et al (2014) explains that the technological (internal and external technologies), organizational (firm size, scope, complexity, slack resources) and environmental (industry and competitors) contexts of a firm can either facilitate or inhibit the acceptance and use of a given technological innovation. For the purpose of this study, the organization-technology-framework was used to prove that agribusiness firms need the know-how, capabilities, and stock of ICT resources to manage their business projects and routines effectively and to facilitate or slow down the acceptance and use of DMPs.

2.2.4 Perceived E-readiness Model (PERM)

The perceived e-readiness model by Molla and Licker (2005) is comprehensive enough for unifying the four factors influencing the use of digital marketing: technology, managerial, organizational, and institutional (Broni and Owusu, 2020). PERM by Molla et al (2014) suggests that perceived organizational e-readiness—POER (awareness, commitment, and the stock of digital information technological resources)—and perceived environment e-readiness—PEER (readiness of market forces, government and other supporting industries)—are critical in a business's decision to adopt and institutionalize the use of digital information technologies..

PERM is relevant and useful for this study, as the government of Tanzania has created an enabling environment to encourage foreign investment in the agricultural sector to transfer technology to the local producers, increase productivity and expand to broader markets, both domestic and international. Concerning the study, the industrialization policy via the Tanzania Kilimo Kwanza strategy of good governance has played a significant role in promoting investment in agribusiness by encouraging local farmers to produce more through the advancement of technology and winning the agribusiness in DMPs.

2.3 Empirical Review

Relevant agricultural e-commerce literature suggests a series of characteristics that will serve as determinants of success for agribusiness DMPs. Molla, Konrad, and Pittayachawan (2010) did a study on e-business use in agribusiness taking a case of the horticulture sector. Their findings showed that technology competence, financial commitment, perceived environmental e-readiness, and organizational size are influential factors that directly affect the use of e-business in agri-business. Furthermore, Molla et al (2014) suggested that government, horticulture associations, growers, and digital marketplace operators, through understanding these factors can make effective decisions to develop their support, capabilities, and offerings towards the success of agribusiness DMPs.

Huizingh et al. (2007) conducted a study on measuring e-commerce website success. Their study suggested that transactional capabilities are important to conduct an online financial transaction; so as to reduce cost as well as increase revenues by attracting new customers and sales or transferring existing sales to a more profitable medium. Junjuni Li (2009) suggested that customers and businesses can create and use an online trading system to place and accept orders, track order and delivery status, make and receive payments, and access and update accounts. Their study concluded that both transactional and informational functions have a positive impact on e-commerce website success.

Because using the World Wide Web to do agribusiness is still relatively new to many organizations, and thus forecasting sales and profits is typically vague (Ghandour, Deans and Benwell, 2012), managers are likely to rely on subjective measures for company's IT spending or expenditure. However, and as noted by Epstein (2004), it is only by making a "business case" for digital technology expenditure that managers can truly integrate the impacts of digital technologies usage into their business. A clear business case can be presented by identifying metrics (with indicators) of digital marketing performance and its impacts on profitability. These indicators empower managers with the information to evaluate whether the digital marketing program is achieving its stated objectives and is contributing ultimately to profitability and organizational benefits, which will satisfy or dissatisfy managers according to the digital marketing stated objectives (Ghandour, Deans and Benwell, 2012).

Additionally, when digital marketing is able to communicate certain features that enhance the experience of agri-businesses, generate trust, and strengthen the competitive position of the company, then managers are inclined to be satisfied if they feel that digital market presence is paying off (Ghandour, Deans and Benwell, 2012). The extent to which this is realized is either in monetary terms (sales increased or cost reduction) or in the form of intangible benefits (Huizingh 2002). Furthermore, previous studies have investigated Internet and Web adoption in agribusiness. For example, Molla et al (2014); Stricker et al. (2003) discussed the situation of agricultural ICT in Germany; Pollard (2003) explored the impact of a government-sponsored e-services program to improve communication activities of farmers in rural Australia. While these studies have contributed to understanding some of the issues of agribusiness, some gaps that motivated this research study do exist. Most of the studies tend to focus on the potential of digital technologies in addressing some of the causes of agribusiness inefficiencies and neglected what agribusinesses should be doing to take advantage of growing digital marketing of products or services using digital technologies such as the internet, display advertising, smartphones apps, and many others (Andreopoulou et al., 2009). Therefore, this paper attempts to resolve the gaps identified in the current literature by analyzing the success factors of agribusiness in Tanzania. The focus of this research, however, is the success of the digital marketplace in the context of digital marketing usage taking the views of the agribusiness firms participating in the digital marketplace. The perceptions of business owners or managers can help to pinpoint areas within the firm where digital marketing creates value (Ghandour, Deans and Benwell, 2011**).**

2.4 Conceptual Framework Variables

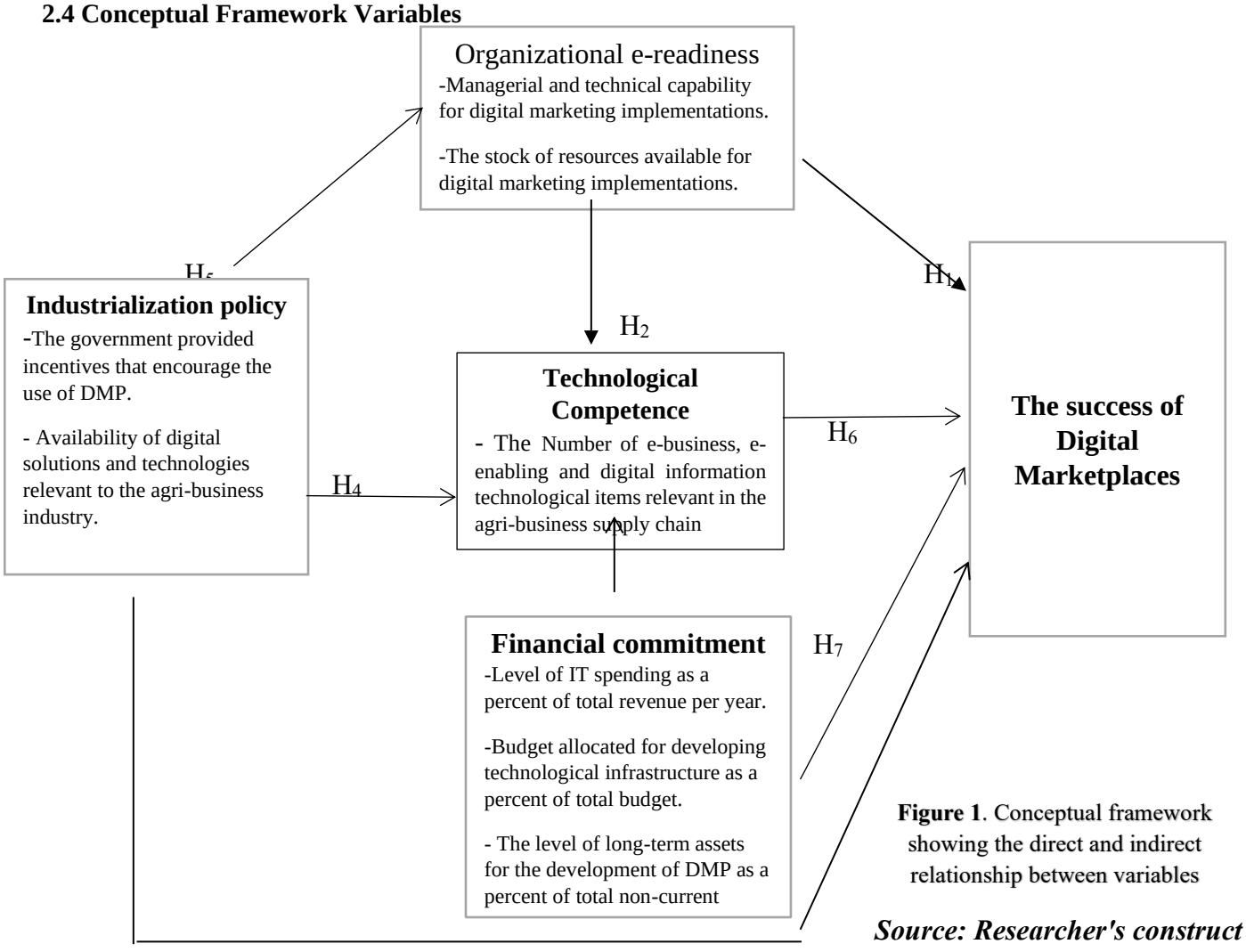

Figure 1. Conceptual framework showing the direct and indirect relationship between variables

Source: Researcher's construct (2019)

i) Perceived organizational e-readiness (POER) and the success of agribusiness DMP

H_1: Firms with greater organizational e-readiness are more likely to use digital marketing to a greater extent.

H_2: Firms with greater organizational e-readiness are more likely to build higher technology competence.

ii) **Industrialization policy and the success of agribusiness DMP**

H_3: Government promotion on the use of modern technology through industrialization policy will stimulate the use of digital technologies and more likely to bring the success of agri-business DMP.

H_4: The government provision of incentives for the use of digital marketing in the agribusiness supply chain is more likely to build higher technological competence.

H_5: The government support on the use of digital information technology in the agribusiness supply chain is more likely to achieve a greater organizational e-readiness.

iii) Technology competence and the success of agribusiness DMP

H_6: Firms with higher technology competence have a greater extent of digital technologies used for marketing products or services.

iv) Firm's financial commitment and the success of agribusiness DMP

H_7: Firms with a greater financial commitment to digital information technologies are more likely to use digital marketing to a greater extent.

H_8: Firms with a greater financial commitment to digital information technologies are more likely to build higher technological competence.

3. Methods

3.1 Research Design

This study employed a quantitative research design. Following the set research objectives, the study quantified the success factors of agribusiness DMPs to arrive at more objective conclusions, testing hypothesis, and determining the issue of causality.

3.2 Area of the Study

The study took place in Dar es Salaam, Kilimanjaro, Arusha, Morogoro, Tanga, Mwanza, and Zanzibar. Dar es Salaam is the country's capital city as well as a principal commercial center for agribusinesses. It is also the major seaport for the country and its landlocked neighbours. Kilimanjaro, Arusha, Mwanza, Morogoro, and Zanzibar are among the business hubs for agricultural activities and headquarters of the agribusiness firms that are using DMPs to sell agricultural and food products. These regions also have the sufficient number of agribusiness firms participating in digital marketplaces and engaged to different agribusiness subsectors.

3.3 Population, Sample, and Sampling Procedures

3.3.1 Population/Sampling Frame

The targeted population for this research paper comprised the agribusiness firms that participate in DMPs from the selected regions in Tanzania (Dar es Salaam, Zanzibar, Arusha, Morogoro, Tanga, Kilimanjaro, and Mwanza).

3.3.2 Sampling Procedure

The Yamane formula of sample size calculation (**Table 1**) was used.

Table 1. Sampling procedure for the study.

Regions	**Population size (N)** Number of agribusiness firms participating in DMPs for each region (Source: Regional Trade Offices 2019)	**Population proportion of size** (Number of agribusiness firms for each region/ Total number of agribusiness firms for the selected region*100)	**Sample size (n)**
Dar	270	68%	135
Zanzibar	14	4%	7
Moro	20	5%	10
Arusha	26	7%	13
Kilimanjaro	10	3%	5
Mwanza	44	11%	22
Tanga	16	4%	8
Total	**400**	**100%**	**200**

A simplified formula for proportions

Yamane (1967) provided a simplified formula to calculate sample size. This formula was used to calculate sample sizes for this study in Figure 1. A 95% confidence level and P = 0.05 are assumed for the equation.

$$n = \frac{N}{1+N\,(e)^2}$$

Where n is the sample size, N is the population size, n is the sample size and *e* the level of precision (Adella, Hepelwa, Yami, Manyong, 2020). When this formula is applied to Table 1, the following results

$$n = \frac{400}{1 + 400(0.05)^2} = 200 \text{ Agribusiness firms}$$

3.3.3 Sample Size

The sample for data collection covered 200 agribusiness firms participating in DMPs from the seven selected regions that were obtained from the records found on trade regional offices. The study sample size included 200 firms because of the econometric analysis that was used to analyze the data; which requires that the sample size must be at least 20 times the number of variables to be used to get accurate results.

3.4 Data Collection Procedure

3.4.1 Type of Data

Primary data was collected using a personally administered questionnaire that was prepared and sent to key management personnel (employees who have authority to directly or indirectly plan and control business operations).

3.4.2 Data Collection Techniques

The study employed the use of personally administered questionnaires. The questionnaire included both open and closed questions.

3.6 Data Management and Analysis

The data was analyzed using the SPSS statistical package for descriptive data analysis, to run the validity test, reliability test, correlation test, and path analysis. Furthermore, cross tabulation which is embedded in the SPSS was used to show the relationship between study variables. Path model analysis is used to examine the relationship between dependent and independent variables (Kwigizile et al., 2020), this research paper used path model analysis to obtain the estimates of the coefficient for each parameter, and to know the significance of the variables and test the study hypothesis.

3.7 Econometric Model

The proposed conceptual model was tested using path analysis. This technique is preferred over multiple regressions because of its ability to account for measurement error, test all hypotheses in the model simultaneously, and control Type 1 error (Molla et al., 2014). The path analysis involves several assessment steps such as performing the validity test, reliability test, and correlation test of the measurement model. Second, the hypothesis was examined by estimating standardized path coefficients. The proposed integrated model in the below Figure 2 is more illustrated by input path analysis in Figure 3

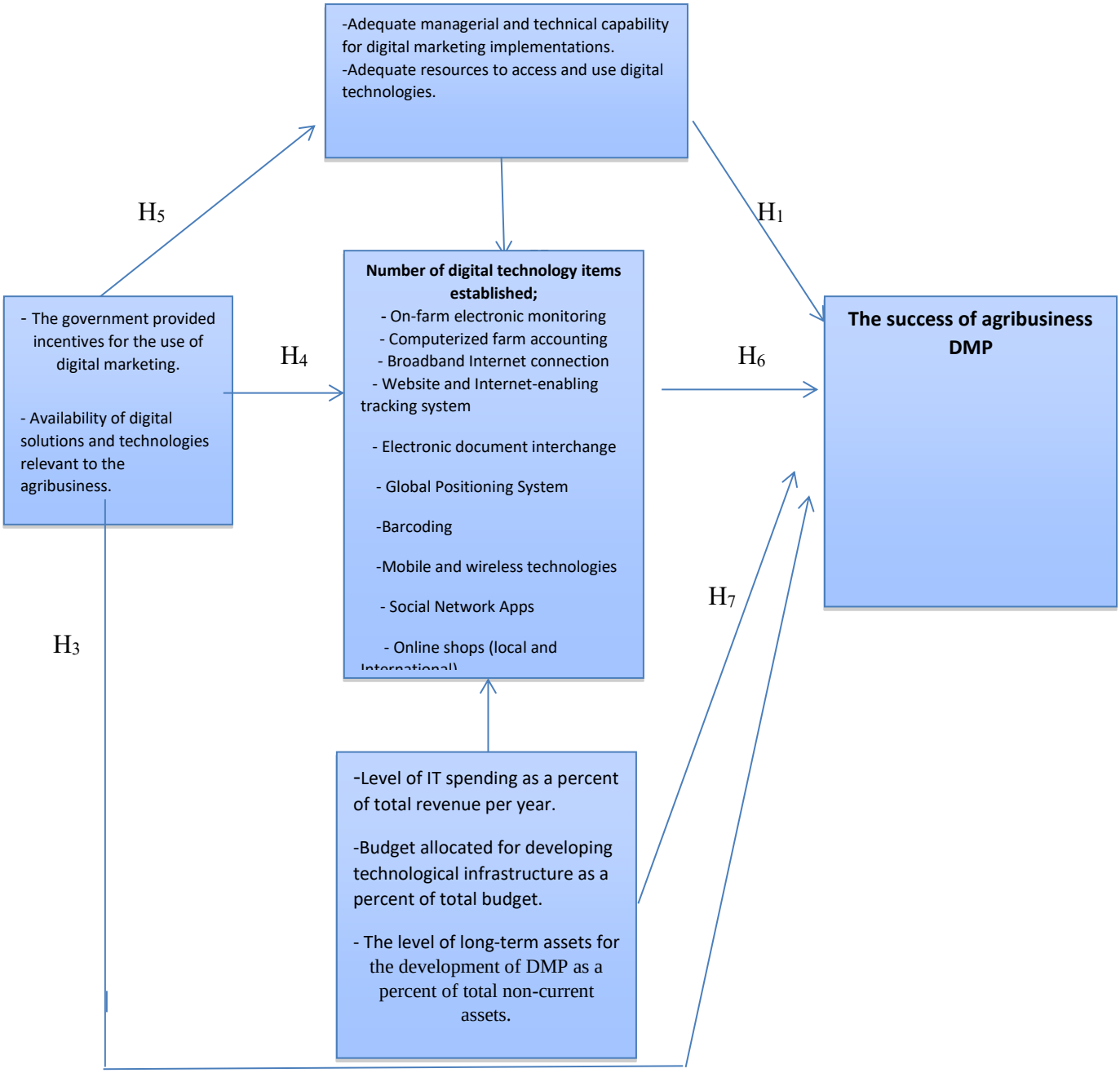

Figure 2. The input path diagram showing the direct and indirect relationship between the study variables.

To move from the input path diagram of causal relationships developed in **Figure 2** to the output diagram, the researcher computed path coefficients. A path coefficient is a **standardized regression coefficient** (beta weight). The researcher was able to compute the path coefficients by setting up the following structural equations:

Success of agribusiness DMP = $\beta_{11OER3} + \beta_{12OER5} + \beta_{13IP1} + \beta_{14IP4} + \beta_{15TC2} + \beta_{16TC9} + \beta_{17TC4} + \beta_{18TC5} + \beta_{19TC6} + \beta_{110TC7} + \beta_{111TC8} + \beta_{112FFC1} + \beta_{113FFC3} + \varepsilon_1$

Technological competence = $\beta_{21FFC1} + \beta_{22FFC3} + \beta_{23OER3} + \beta_{24OER5} + \beta_{25IP1} + \beta_{26IP4} + \varepsilon_2$

Organizational e-readiness = $\beta_{31IP1} + \beta_{32IP4} + \varepsilon_3$

Whereby,

1) OER5 = Adequate managerial and technical capability for digital marketing implementations
2) OER3 = Adequate resources to access and use digital technologies
3) IP1 = Government provided incentives for the use of digital marketing
4) IP4 = Availability of digital solutions and technologies relevant to the agribusiness industry
5) TC2 = Computerized farm accounting
6) TC9 = Online shops and social networks
7) TC4 = Website and Internet-enabling tracking system
8) TC5 = Electronic document interchange
9) TC6 = Global Positioning System
10) TC7 = Barcoding
11) TC8 = Mobile and wireless technologies
12) FFC1 = The level of IT spending in the company as a percent of total revenue per year
13) FFC3 = The level of long-term assets for the development of digital marketing assets as a percent of total non-current assets.
14) The terms $\varepsilon_1, \varepsilon_2, \varepsilon_3$ are the error or unexpected variance terms.

3.8 Operationalization of Variables Specified in the Model

3.10.1 Measurement of the Success of Agribusiness Digital Marketplace

This study adopted the updated DeLone & McLean (D&M) Information System Success Model (2003) to obtain the metrics for the success measure of agribusiness DMPs. The D&M model is useful for the study because, since 1992, it has been the central study for all research addressing the success of Information System Morteza (2014). This research is no exception in recognizing the potential of the model and its applicability to identify the success measure of DMPs for the following reasons:

- The D&M model is based on communication theory; it is highly suited to measuring the digital information technology and communications phenomenon that is the Internet.
- The creation of the updated D&M IS Success Model is driven by a process that understands digital information technology and the net benefits obtained from using digital technologies(Ghandour, Deans and Benwell, 2012)

Furthermore, According to Tang et al (2006) and Motaghian et al (2013) the updated D&M Success Model identified six interrelated dimensions of success in Information System as follows: system quality, information quality, and service quality, intention to use, user satisfaction, and net benefits. According to Ghandour, Deans and Benwell (2012); The Model suggested that the quality of the content, system, and service of the Information System determine the users' intention to use, their actual use, and their satisfaction with the Information System (DeLone and McLean 2003). In relation to the study, the more satisfied the users (agribusiness firms participating in DMP) are with the DMPs, the more users will use it, and this determines the benefits that the users obtain from using the Agribusiness DMPs. The benefits then reinforce the users' intention to use, their actual use, and their satisfaction with the agri-business DMPs in Tanzania.

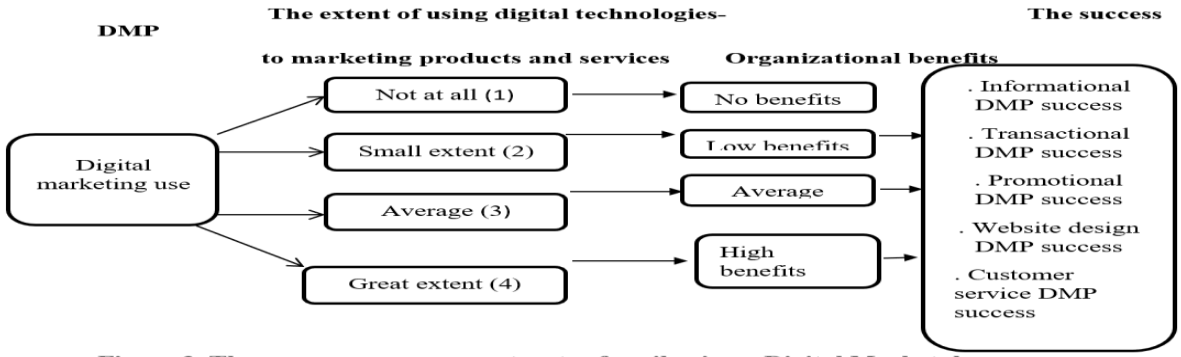

Figure 3. The success measure constructs of agribusiness Digital Marketplace.
Source: Researcher's construct based on the DeLone and McLean Model, 2003.

4. Results

4.1 Descriptive Analysis

Table 4.1. The profile of respondents (agribusiness firms participating in DMP).

Socioeconomic variable	Frequency	Percent
Region		
Arusha	13	6.5
Dar es Salaam	135	67.5
Kilimanjaro	5	2.5
Morogoro	10	5
Mwanza	22	11
Tanga	8	4
Zanzibar	7	3.5
Total	**200**	**100**
Business Age		
< = 5	52	26
6–10	61	30.5
11–20	55	27.5
21–30	16	8
> 31	16	8
Total	**200**	**100**
Agri-business subsector		
Growers	8	4
Retail/Wholesalers	42	21
Exporters	8	4
Agriculture equipment suppliers	20	10
Commercial farms	7	3.5
Warehousing and storage	12	6
Irrigation farms	3	1.5
Fertilizer and pesticides suppliers	11	5.5
Agribusiness associations	2	1
Production, harvesting services, and logistics	7	3.5
Marketing and distribution services	27	13
Processors	14	7
Catering, restaurants, bakery	4	2
Beverage's suppliers and producers	5	2.5
Farmers	10	5
Importers	6	3
Agribusiness marketing, consulting, advertising agency	14	7
Total	**200**	**100**
Business employee size		

Micro (< = 4)	31	15.5
Small (5–19)	58	29
Medium (20–99)	54	27
Large (> = 100)	57	28.5
Total	**200**	**100**
Business category		
Sole proprietor	44	22
Partnership	6	3
Company	133	66.5
Institution	2	1
Agency	3	1.5
Organization	9	4.5
NGO	3	3
Total	**200**	**100**
Respondent's position in the company		
Managing Director/CEO	48	24
Chief Accountant	26	13
Administrative Manager	11	5.5
Operations Manager	25	12.5
Branch Manager	3	1.5
Finance Manager	7	3.5
HR Manager	4	2
Sales & Marketing Manager	76	38
Total	**200**	**100**
Education Level		
Ordinary secondary education	7	3.5
Advanced secondary education	6	3
Diploma	29	14.5
Degree	129	64.5
Masters	28	14
PhD	1	0.5
Total	**200**	**100**

Source: SPSS output data, 2019

Table 4.1 above shows that most of the agribusiness firms (67.5%) participating in DMPs are located in Dar es Salaam, which is a principal commercial area for agribusinesses. Most of the respondents (38%) were marketing managers and 24% were managing directors/CEOs, thus they had adequate awareness about the relevance of DMPs to their business practice. The majority of the agribusinesses had been operating for a period of six to ten years. Of these, micro agribusiness firms made up 15.5%, small agribusiness firms 29%, medium agribusiness firms 27%, and large agribusiness firms 28.5% of the total number of samples selected; that gives a researcher a good way to make comparisons on why some firms realize higher benefits from the use of DMP and succeed in digital marketing while some do not succeed in digital marketing of products and services.

Most of the agribusinesses (66.5%) were registered companies with business licenses and recognition to conduct business transactions, marketing, and trading services online. The majority of the respondents (64.5%) had attained a first degree, indicating that they possessed the capabilities to implement digital marketing for building and developing sustained DMPs. Moreover, the majority of the agribusiness firms engaged in wholesale and retail supply of agricultural products using DMPs (21%) and marketing & distribution services (13%) since they dealt with local producers and final consumers.

4.1.2 The Relationship between Dependent Variable and Independent Variables

Table 4.2. Cross-tabulation between organizational e-readiness and success of agri-business digital marketplaces.

	The success of agribusiness DMP			**Total**
	Small extent	**Average**	**Great Extent**	
	Exchange of trading information online and in real time			
1. Adequate awareness about DMP				
Strongly agree	3	27	87	117
Somewhat agree	15	32	24	71
Not sure	0	1	0	1
Somewhat disagree	9	1	1	11
Strongly disagree	0	0	0	0
Total	**27**	**61**	**112**	**200**
2. Application of digital information technology	**The website provides access to database and information relevant for agribusiness industry**			
Strongly agree	6	42	92	140
Somewhat agree	6	35	15	56
Not sure	0	0	0	0
Somewhat disagree	3	1	0	4
Strongly disagree	0	0	0	0
Total	**15**	**78**	**107**	**200**
3. Adequate resources to access and use internet	**Shipment and logistics management are facilitated via the internet**			
Strongly agree	3	30	81	114
Somewhat agree	11	35	25	71
Not sure	0	1	0	1
Somewhat disagree	6	7	1	14
Strongly disagree	0	0	0	0
Total	**20**	**73**	**107**	**200**
4. Automated business	**Joining electronic intermediaries (e-markets) for online purchase or sale of products**			
Strongly agree	1	19	74	94
Somewhat agree	9	51	31	91
Not sure	0	1	1	2
Somewhat disagree	10	3	0	13
Strongly disagree	0	0	0	0
Total	**20**	**74**	**106**	**200**
5. Adequate managerial and technical capability	**Stock availability, prices, and delivery time are shared electronically and in real time**			
Strongly agree	1	25	74	100
Somewhat agree	20	39	29	88
Not sure	0	0	0	0
Somewhat disagree	9	3	0	12
Strongly disagree	0	0	0	0
Total	**30**	**67**	**103**	**200**
	Website supports online advertisement of the products and events to communities			

6. Implementing, building, and developing sustained DMP	3 3 0	22 47 0	92 25 0	117 75 0
Strongly agree	5	3	0	8
Somewhat agree	0	0	0	0
Not sure	**11**	**72**	**117**	**200**
Somewhat disagree				
Strongly disagree				
Total				

Source: SPSS output data, 2019

The cross-tabulations results in Table 4.2 above show that, out of 112 agribusiness firms which use digital marketing to a greater extent, 87 firms strongly agreed to have adequate awareness about the use of DMPs for exchange of trading information (such as orders, delivery notices, invoices, statements, and remittance advice) online and in real time. Likewise, 92 firms strongly agreed that application and use of digital information technology have provided benefits to their line of business, including the creation of the company website which provides access to database and information relevant for the agribusiness industry. Also, the majority of the respondents (81 firms) which possess adequate resources to access and use the internet in performing their business transactions, operations, and projects strongly agreed that the application and use of digital information technology has provided benefits to their line of business.

Moreover, 105 agribusiness firms with strongly automated business processes for the use of digital information technology agreed that they had joined electronic intermediaries to a greater extent. Likewise, 103 firms agreed that they had adequate managerial and technical capability for digital market implementation that enabled them to share stock availability, prices, and delivery time to a great extent. In addition, 117 firms with websites which support online advertisements of products and events to communities strongly agreed to provide the necessary resources to implement, build, and develop sustained DMPs.

Table 4.3. Cross-tabulation between industrialization policy and success of agri-business digital marketplaces

	The success of agribusiness DMPs			**Total**
	Small extent	**Average**	**Great extent**	
	Joining electronic intermediaries (e-markets) for online purchase or sale of products			
1. Government provided incentives				
Strongly agree	2	15	34	51
Somewhat agree	7	32	47	86
Not sure	2	11	6	19
Somewhat disagree	8	16	19	43
Strongly disagree	1	0	0	1
Total	**20**	**74**	**106**	**200**
2. Government engagement with agribusiness firms electronically	**Exchange of trading information online and in real time**			
Strongly agree	3	17	47	67
Somewhat agree	15	25	49	89
Not sure	3	4	3	10
Somewhat disagree	6	15	13	34
Strongly disagree	0	0	0	0
Total	**27**	**61**	**112**	**200**
3. Nature of regulatory authority encourages the use of DIT	**Website supports online advertisement of the products and events to communities**			

Strongly agree	0	20	51	71
Somewhat agree	9	44	39	92
Not sure	1	3	5	9
Somewhat disagree	5	11	10	26
Strongly disagree	0	0	2	2
Total	**15**	**78**	**107**	**200**
4. Availability of digital solutions and technologies	**Stock availability, prices, and delivery time are shared electronically and in real time**			
Strongly agree	2	24	52	78
Somewhat agree	10	23	38	71
Not sure	3	8	4	15
Somewhat disagree	5	18	13	36
Strongly disagree	0	0	0	0
Total	**20**	**73**	**107**	**200**
5. Government institutions engagement with agribusiness firms in DMP	**Shipment and logistics management are facilitated via the internet**			
Strongly agree	2	14	51	67
Somewhat agree	10	26	36	72
Not sure	1	8	1	10
Somewhat disagree	17	19	15	51
Strongly disagree	0	0	0	0
Total	**30**	**67**	**103**	**200**

Source: SPSS output data, 2019

The cross-tabulations results in Table 4.3 above show that, out of 106 agribusiness firms which use electronic intermediaries (e-markets) to a greater extent, only 34 strongly agreed that government provides incentives for the use of DMPs in their business practices. Likewise, only 67 of 200 firms strongly agreed that the government of Tanzania needs to engage with them electronically. Of the 107 agri-business firms with websites that support online advertisements of products and events to communities, only 51 strongly agreed that the nature of regulatory authorities encourages them to use digital information technology in their operations, projects, and transactions.

Likewise, only 78 agribusiness firms out of 200 strongly agreed on the wide availability of digital solutions and technologies relevant to the agribusiness industry to facilitate the sharing of stock availability, prices, and delivery time electronically and in real time. Also, only 67 out of 200 agribusiness firms strongly agreed that government institutions are ready to engage with them in DMPs.

4.1.3 Summary of the Firm's Financial Commitment

Figure 4.1 below depicts that the majority of the agribusiness firms use 41% to 60% of their total revenue per year as IT spending; this shows that these firms engage in digital marketing because they realize the benefits generated from the use of digital technologies in developing benefits associated with DMPs. In fact, most of their systems have already been strongly automated so as to capture the net benefits of employing digital information technologies to their line of business.

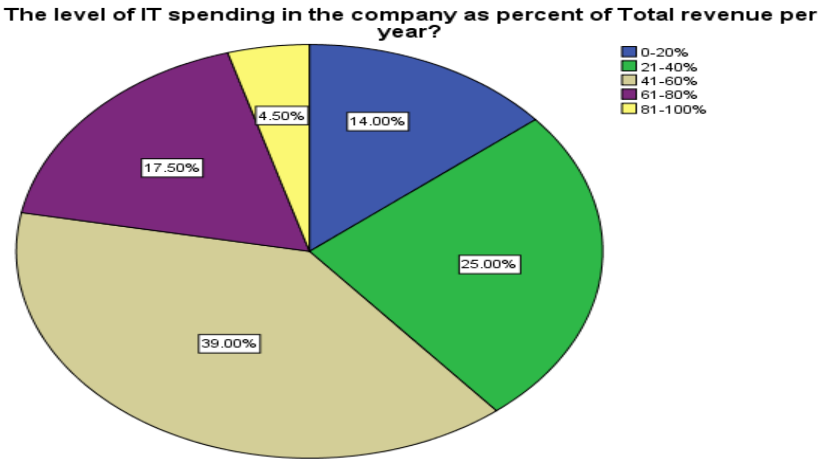

Figure 4.1 Summary of the level of IT spending as a percent of total revenue per year.

Figure 4.2 below depicts that the majority of the agribusiness firms allocate 41% to 60% of their total budget per year for the development of ICT infrastructure; these results are in line with the results of the level of IT spending in the company. This indicates that the IT expenditure for most of the agribusinesses firms matches the budget allocated for the development of ICT infrastructure. Thus, they justify IT expenditure in the organization in line with the study by Ghandour et al (2012), as a measure of agribusiness digital market success, along with other organizational benefits that managers determine their IT expenditure according to their satisfaction and profit generated from the use of digital information technology.

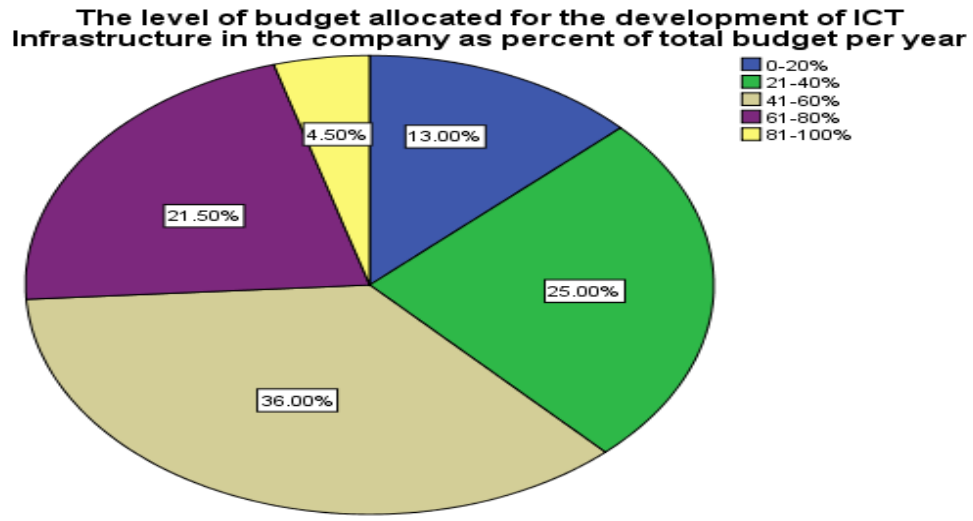

Figure 4.2 Summary of the level of budget allocated for the development of ICT as a percent of total revenue per year.

Figure 4.3 below depicts that the majority of the agribusiness firms have made long-term investments in the development of digital market assets with 81% to 100% level of long-term assets for the development of digital technologies that digitize their value chain processes and functions; to communicate, interact, and transact with their trading partners, and result in company profitability.

Figure 4.3 Summary of the level of long-term assets for the development of DM assets.

Table 4.4. Summary of firm's technology competence.

Number of digital information technological items	Number of companies using certain technology out of 200 companies	Percentage
On-farm electronic monitoring	9	4.5
Computerized farm accounting	23	11.5
Broadband internet connection	74	37
Website and internet-enabling tracking system	73	36.5
EDI (Electronic Document Interchange)	117	58.5
Global Positioning System (GPS)	96	48
Barcoding	55	27.5
Mobile and wireless technologies	159	79.5
Social networks	178	89
Online shops	76	38
Accounting systems	114	57

Source: SPSS output data, 2019

Table 4.4 above shows that there is limited use of on-farm electronic monitoring, computerized farm accounting, and barcoding to sense, monitor, track, and transact agribusiness activities. Very few agri-business firms e-enabled their supply chain with farm automation technologies (only 4.5% of on-farm electronic monitoring and 11.5% of computerized farm accounting) to provide real-time information in the pre-harvest maturity monitoring, ripeness determination, and postharvest treatment of agricultural products, respectively. However, there is a greater use of the digital marketplace for selling and buying via local online shops (such as Ninayo, Jumia Food, Fursa 101, and Hello Food), international online shops (such as Alibaba, eBay, and Amazon), and social networks (such as Facebook, Instagram, Twitter, Linked in, yellow page, Zoom Tanzania, and WhatsApp). There was greater access to business-to-business technologies such as electronic data interchange, accounting systems, global positioning systems, website and internet-enabled tracking along the agribusiness supply.

5. Path Analysis and Discussion of Findings.

The proposed model (Figure 5) was tested using path analysis in SPSS.

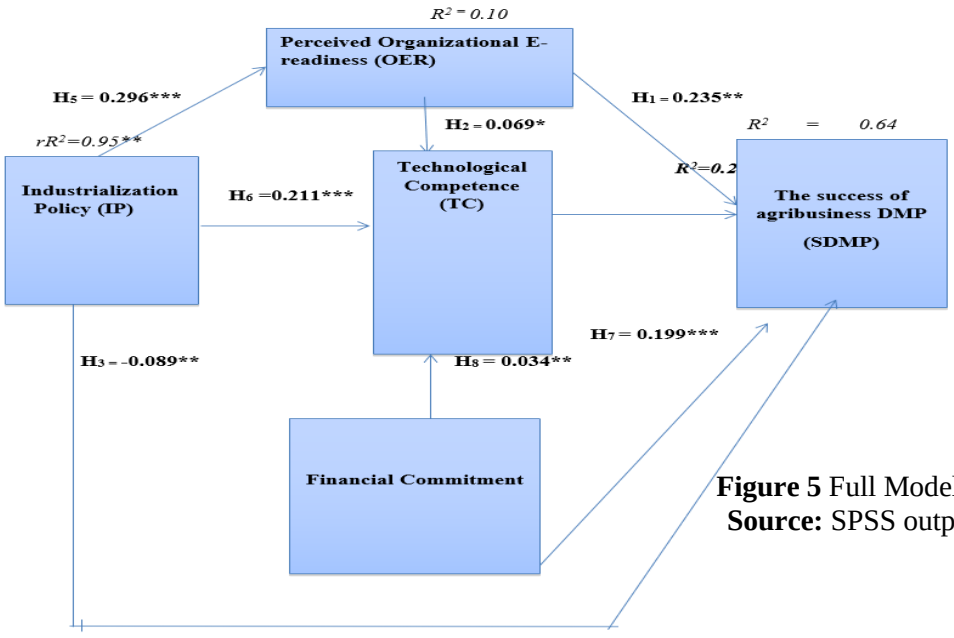

Figure 5 Full Model Test Results.
Source: SPSS output data, 2019

The asterisks (***), (**), and (*) represent 1%, 5%, and 10% level of significance, respectively. The model has evaluated whether it fits the data, and the results show that R-square is 0.64, which indicate that the model represents the data very well. The hypotheses were examined by estimating standardized path coefficients. The results (Fig. 5) show that the relationship between perceived organizational e-readiness, financial commitment, technological competence, and success factors of agribusiness digital marketplace was statistically significant and positive, whereas the government promotion through industrialization policy had a negative relationship with the success factor of the agribusiness digital marketplace. The results showed that the first model explains 64% of the variance in success factors of agribusiness digital marketplace. Further, the second model indicated that 22% of the variance in technological competence is explained by financial commitment, industrialization policy, and organizational e-readiness factors. The third model shows that industrialization policy explains 10% of the variance in organizational e-readiness. The findings is in line with the Keimasi and Chitsazan, 2015)

Organizational e-readiness

Organizational e-readiness is statistically significant and positively related to the success of the agribusiness digital marketplace, meaning that adequate awareness and resources to access and use digital technologies are essential for successful digital marketing implementations. These findings are in line with the findings by Kumar, Sinha and Gupta (2018) and Molla and Licker (2005) who concluded that an organization's capability concerning e-business awareness, commitment, and resources is very important for the success of e-business practices in agribusiness. This finding is also supported by that of Yilmaz et al (2020) who concluded that agribusinesses' knowledge on application of ICTs to trade with less effort influences their e-readiness to participate in the digital marketplace.

Industrialization policy

Government promotion through an industrialization policy is statistically significant and negatively related to the success of agribusiness DMPs in Tanzania; which provides evidence that the Tanzanian agribusiness supply chain appears to lack enough government promotion and incentives to stimulate the widespread use of digital solutions and technologies in agribusiness operations, projects, and transactions. On the other hand, research findings by Molla et al (2014), Zhu and Kraemer (2005), and Xu et al. (2009) suggested that the readiness of a firm to conduct business electronically depends not only on its efforts but also on the support from the government and regulatory institutions.

Technology Competence

Technology competence is statistically significant and positively related to the success of agribusiness DMPs; meaning that agribusiness firms with higher technology competence are more likely to make more use of digital technologies to attain benefits from the digital marketing of products or services. This finding is supported by those of Sean Xu (2010), Bryceson (2006), Clasen and Mueller (2006), and Zhu and Kramer (2005) who concluded that greater access to e-business technologies such as on-farm electronic monitoring, electronic data interchange, accounting systems, global positioning systems, website, and internet-enabled tracking along the agribusiness supply chain facilitate the exchange of information..

Nevertheless, the findings show that micro agribusiness firms have limited the use of e-business and e-enabling and digital information technological items to sense, monitor, track, transact, and support online advertisement and marketing of agricultural products and services. This is evidenced in Figure 5.1 which depicts that micro agribusiness firms have a limited use of on-farm electronic monitoring, computerized farm accounting, bar coding, electronic document interchange, website, and an internet enabling tracking system to sense, monitor, track, and transact agribusiness transaction and trading activities.

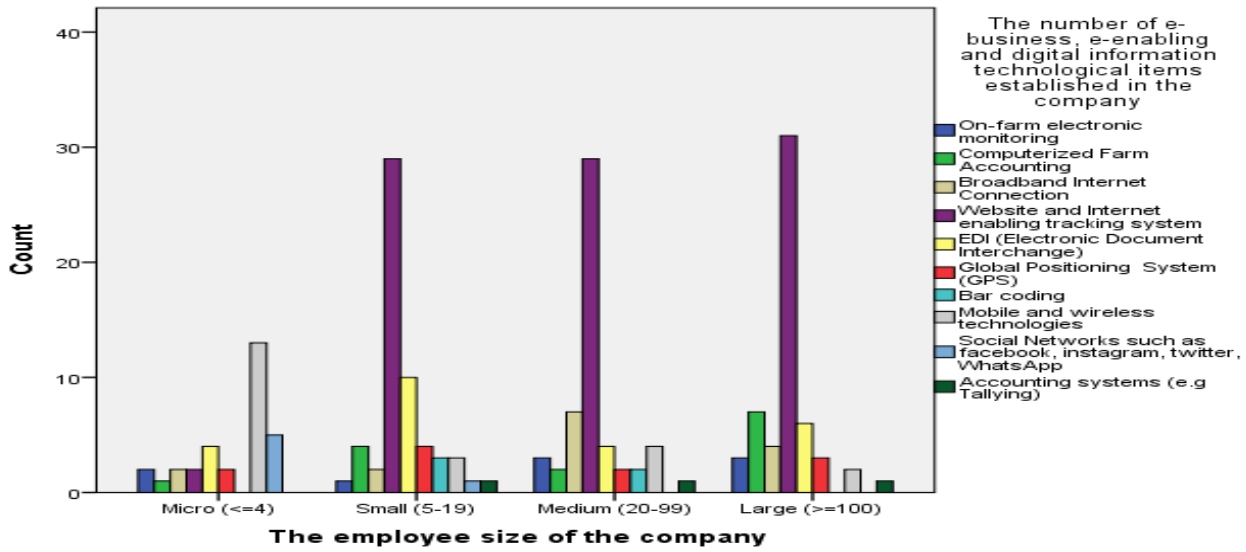

Figure 5.1 The firm's employee size and the level of technology competence.

Financial Commitment

Financial commitment is statistically significant and positively related to the success of agribusiness DMPs, meaning that firms with greater financial commitment to digital information technologies for the production, marketing, and distribution end of the agribusiness chain are more likely to develop e-business capabilities and use digital technologies to a greater extent to exchange the trading information with their partners electronically and in real time. This finding is supported by those of Mavondo (2005) and Zhu and Kraemer (2005) who concluded that financial resources are very crucial for IT investments in agribusinesses; which in turn enables the agribusiness firms to realize higher benefits generated from the use of such technologies.

Again, the findings of this study are in line with Weerasinghe, 2009 on the managerial innovation models, on the relative advantage of one technology (digital marketplaces) over the alternative (physical markets). Therefore, this study gives researchers a good way to compare why some firms succeed in digital marketing and some don't. From the findings, medium and large agribusiness have a greater financial commitment to digital information technology and use digital marketing to a greater extent, which implies that these firms have realized higher economic benefits from investing and using digital marketing technologies in their lines of business. This is evidenced in Figures 5.2 and 5.3, respectively.

Figure 5.2 depicts that medium and large agribusiness firms have a higher IT spending, that is, they use 61%–80% and 81%–100% of their total revenue per year for IT spending, respectively. This is because these firms have engaged in digital marketing and realized the higher benefits associated with the use of DMPs. Unlike the small and micro agribusiness firms, that use 0–20% and 21%–40% of the total revenue per year for IT spending, respectively.

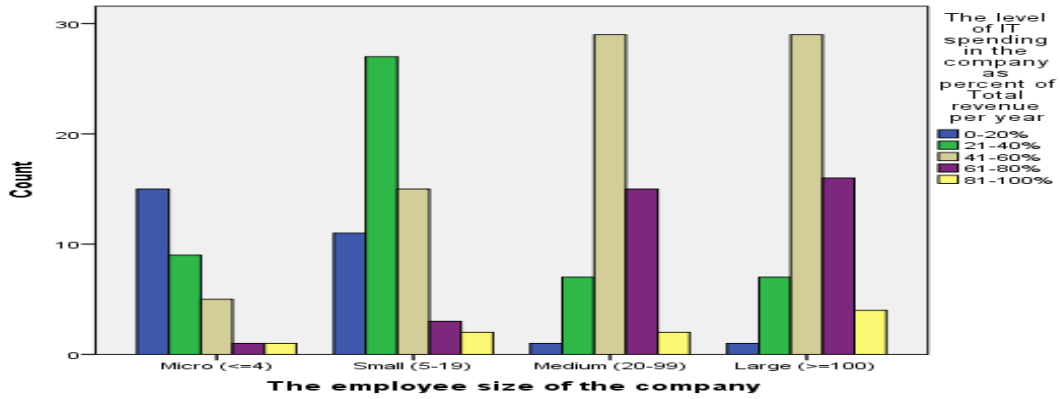

Figure 5.2: Firm's employee size and the level of IT spending in the company.

Further, Figure 5.3 below indicates that medium and large agribusiness firms have made a long-term investment on the development of digital market assets with 61–80% and 81 to 100% level of long-term assets for the development of digital technologies, respectively. This implies that these firms have a greater focus on long-term digital technology investments in terms of time and money, which is important to build technology competence and capture the performance. On the other hand, micro and small agribusiness firms make an investment with 0–20% and 21–40% level of long-term assets for the development of digital marketing, but their level of investment is low compared to that of large and medium agribusiness firms. This means that efforts are needed for these firms to recognize the need to assess the payoffs of the digital marketing investment, and capture the opportunities of the growing demands of digital marketing and the net benefits of employing digital information technologies to their line of business.

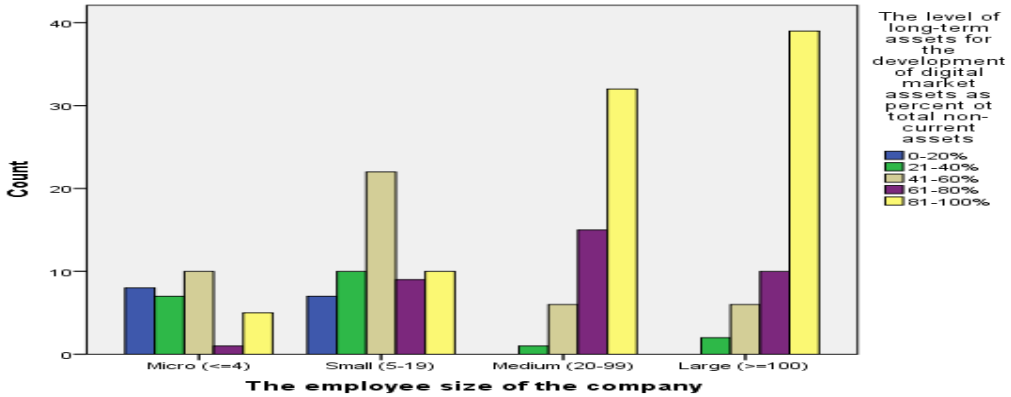

Figure 5.3. The firm's size and the level of long-term assets for the development of DMP.

5. Discussion

The study has managed to establish that firm's financial commitment and technological competence, organizational e-readiness, and government-provided incentives are essential factors for successful digital marketplace implementations (also supported by Ton et al. (2001), Sticker (2003), Bryceson (2006), Clasen and Mueller (2006), Zhu and Kramer (2005), Morteza (2013), and Lai et al. (2006), Enver (2007) and Munirah (2022)

The study was able to establish that the organizational e-readiness is statistically significant and positively related to the success factors of agribusiness DMPs; implying that firms with greater organizational e-readiness are more likely to use digital marketing to a greater extent, as it was postulated on the first study assumption (H_1).

The study established that the success of agribusiness DMPs is highly influenced by the firm's financial commitment to use digital information technologies, as it was postulated in the seventh hypothesis (H_7).

This is in line with the findings by Mavondo (2005), Zhu and Kraemer (2005) and Boston (2002). Moreover, the study findings reveal that firms with a greater financial commitment to digital information technologies are more likely to build higher technological competence, as it was postulated in the eighth hypothesis (H_8). This is in line with Boston (2002).

The study reveals that the success of the agribusiness digital market is highly influenced by the firm's technological competence, as it was postulated in the sixth hypothesis (H_6). This finding is also in line with that of the technological perspective frameworks by Rogers (2003) and managerial innovation models by Damanpour (1991).

The path model results indicate that government promotion through an industrialization policy relationship has a negative relationship with the success of agribusiness DMPs. This finding does not support the third hypothesis (H_3) that government promotion of the use of modern technology will stimulate the use of digital technologies and more likely to bring about the success of agribusiness DMP. This is because the Tanzanian agribusiness supply chain appears to lack adequate government promotion and incentives to stimulate the widespread use of digital information technologies in agribusiness operations, projects, and transactions. This finding is in line with Molla et al (2014) and Kumar et al (2021)

However, the study reveals that the government support on the use of digital information technology in the agribusiness supply chain is more likely to achieve a greater technological competence and organizational e-readiness as it was postulated in the fourth (H_4) and fifth (H_5) hypotheses, respectively. This is in line with Munirah (2022).

6. Conclusion

6.1.1 Facilitators: Government Agencies, Policy Makers, and Development Agencies

The government and policymakers should note that there is a possibility of high penetration of digital marketing usage in the agribusiness sector in Tanzania; agribusinesses are more ready to participate, make application and use of digital information technology, develop managerial and technical capability, and spend and invest in long-term assets for the development of ICT infrastructure and digital market assets.. Therefore, strong government promotion of DMPs and involvement of potential policymakers from government institutions, development agencies, and private sectors (involved in the agribusiness supply chain), are vital in facilitating access to digital marketing opportunities.

Furthermore, initiatives by the government, policymakers, and development institutions should be made to support and speed up the wide use of digital information solutions and technologies in agribusiness, for example, through (i) the creation of favourable regulatory conditions to ease the use of DIT in agri-business operations, projects, and transactions; (ii) creation of an electronic system for acquiring goods transportation clearance online and in real time; (iii) organizing a session, workshops, and conferences for discussion with key stakeholders along the agribusiness value chain to push the use of DMPs; (iv) encouraging agro-entrepreneurs to register their businesses in order for them to acquire a business license and recognition to conduct business transactions, marketing, and trading services via online shops and trading platforms.

The government should build capacity to enhance digital tools utilization in the agribusiness sector, and ensure the availability of digital market assets and equipment at low cost (through tax exemptions. In implementing this, the primary focus should be on creating awareness on agribusiness DMPs, describing opportunities, benefits, and marketing strategies of DMPs to all key players along the agribusiness supply chain. Publicity for DMPs is very important in the promotion of digital marketing usage; hence there should be the creation of public awareness and acceptance on the use of digital technologies for production, marketing, and trading activities. This should be done through the use of available technical human resources that can share their experiences and knowledge in workshops and conferences, and provide detailed insight into the government institutions. Moreover, this can be done through advertisement in media, including advocating radio and television shows and programs on the use of agribusiness DMPs.

Also, the government and development agencies can launch programs and conduct a number of awareness campaigns that encourage their engagement with agri-businesses electronically.

The secondary focus of the government should be on the provision of incentives to key players along the agribusiness supply chain that motivate them to use digital information technologies for marketing their products and services. The Government of Tanzania (GoT) should support start-up agro-processing projects involving the use of digital marketing of products and services; GoT should allocate more funds to the research and implementation of agribusiness DMP projects, conduct digital promotion of small-scale agricultural production, and acquire important lessons, and best practices. GoT should also adopt relevant digital technologies from the world leading countries in agri-business DMPs such as China, Australia, USA, and India. The government should continue to seek funds from multilateral organizations such as USAID and FAO, to implement agro-projects that encourage the use of digital information technologies.

6.1.2 Supporters: BDS Providers, Financial Institutions, and ICT Industry

The involvement of providers of business development services (BDS), financial institutions, and the ICT industry is very important in providing resources for implementing, building, and developing sustained DMPs and related ICT infrastructure for the agribusiness industry. BDS providers, financial institutions, and the ICT industry should offer agribusiness entrepreneur skills and training, and financial and technical support to both the government of Tanzania and agri-business key players (such as agro-processors, farmers, inputs suppliers, logistics and transport companies, traders, and consumers.) in order to provide understanding, confidence, and competence that help agri-businesses to participate and realize benefits from the use of DMPs.. Also, they should organize a session, workshops, and conferences for discussion with key stakeholders along the agribusiness value chain on how to enhance the active use of websites for all agribusiness firms.

Financial institutions such as banks should support start-up agro-processing projects encompassing the use of digital marketing of products and services. Also, they should come up with products which innovate or invent new technologies for marketing agricultural products. Moreover, financial institutions such as TADB should offer loans to agribusiness DMP participants to invest in long-term assets for the development of digital market assets, under reasonable and guaranteed conditions. By doing so, financial institutions should make agribusiness DMP participants committed to digital marketing usage. Agri-business DMP participants need to be more committed by conducting online advertisements and remote displaying of products or services during production and marketing. This advertisement should be obligatory for agribusiness DMP participants using funding from financial institutions.

The ICT industry key players (such as TCRA, telecommunication companies) should play a major role in developing technological resources and assets that provide access to database and information relevant for the agribusiness industry. The emphasis should be on the establishment of digital information centers for connecting agribusiness key stakeholders; improvement of agri-business information technology; and marketing strategies to include face to face, teleconferences, and online live chat programs for agribusinesses to interact with existing and prospective customers. In addition, the ICT industry can play a role in disseminating e-business knowledge, showcasing, designing, and establishing relevant ICT applications.

6.1.3 Key Players

The key players engaging in the DMPs need to seek more opportunities that enhance the know-how, capabilities, and the stock of ICT resources to manage and facilitate their business projects and routines effectively online and in real time. This can be done by maintaining reliable, assured market, and the display of market prices through the internet. By doing so, it will open doors for the younger generation to be leaders in presenting and topping new digital information technologies into Tanzania agricultural systems which have the potential to empower rural farmers to market their products more effectively.

6.1.4 The Creation of Online Mobile Trading Platform

The key players faced challenges of accessing the appropriate business development services (BDS) and financial services as well as auxiliary services from facilitators (government agencies and development institutions) to foster their performance.

Therefore, the researcher recommends the designing and establishment of the **online trading platform supported by mobile technology** to bridge the information and transaction/market gap, and facilitate effective and efficient online transactions and information sharing among key players along the agribusiness value chain. This is supported by Ogbeide and Ele (2020). The researcher also recommends connecting these key players with facilitators and supporters of the agribusiness supply chain in Tanzania and the East African Community.

6.1.5 Developing and distributing Agricultural Insurance Solutions to farmers.

This involves combination of Mobile Technology as well as Satellite remote sensing technologies; whereby, Machine learning and Satellite data are combined to understand how Climates behave. Example; to know how the area has been affected by floods; Therefore, this policy brief recommends the designing and deliverance of Innovative Agricultural Insurance and Digital products to help farmers endure yield risks, improve their farming practices and bolster their income over time. This is also supported by FAO, 2023; Pilot Digital Village Initiative in Africa.

6.3 Areas for Further Research.

In presence of wide predictions of the potential of doing agri-business over the Internet, the agri-businesses are advised to join and use the electronic intermediaries (digital markets) for online purchase or sale of products. However, there is a general outcry that agri-business firms throughout the agribusiness value/supply chains face a severe challenge to develop into a functional online trading platform for the produced raw materials and processed agricultural products. This study has managed to provide insights on the first challenge by providing information on the success factors of agri-business digital marketplaces in Tanzania. Another area of interest that the researcher suggests is trying to look at government incentives (economic, market-based incentives and advocatory incentives) that promote agri-businesses and private sector participation in the development of digital marketplaces, ICT related infrastructure and digital marketing projects in Tanzania. In this way, we will be able to know the incentives-based instruments targeting private sector in the promotion of digital marketing adoption, as private investment is also crucial in promoting the use of digital marketplaces in Tanzania. It will also enhance a combination of private financing and public funding in the development of digital marketplaces and future projects associated with building and developing sustained digital marketplaces. Thus, bring balance to the interest of both public (demand side) and investors (supply side). Another area of interest should be on the actions of other institutional agents towards the development of digital marketplaces in Tanzania.

7. Acknowledgement

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