

Literacy Utilisation of Information Technology for Farmers in Badung Regency, Bali, in the Era of Industrial Revolution 4.0

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Very rapid changes have occurred as a result of the current 4.0 industrial revolution. One of them is the development of agricultural aspects, which initially only appeared in agricultural products, now it has expanded to the marketing process of agricultural products. The conditions that occur are not always ideal because farmers often suffer losses because of the decrease in selling price of crops and so on. This study aims to contribute to the government, community stakeholders, especially farmers, to enable the use of information technology in the fields of production, distribution, promotion in agriculture. Two problems addressed in this study are: (1) the literacy utilisation of information technology in the agricultural industry in relation to industrial revolution 4.0; and (2) the factors that hinder the said problematise qualitative methods. The data used in this study are qualitative and quantitative data. Meanwhile, the data sources are obtained in the form of primary and secondary data as well as the determination of informants by using purposive sampling techniques. The research location took place in Mengwi District, Badung Regency, Bali Province. The research results show that the optimisation ology literacy utilisation application in agriculture create skilled-human resources in relation to agricultural development in the industrial revolution era 4.0. The conclusions and suggestions of this study are the maximization of the application of information technology literacy in the era of revolution 4.0.

Keywords: *Literacy, Information Technology, Industrial Revolution 4.0, Farmers*



Introduction

The current development of information technology causes mediamorphosis. Mediamorphosis is the transformation of communication media, which is usually caused by the complex interrelationships between various perceived needs, competitive and political pressures, as well as various innovations and technologies, in which the media transformed due to the development of information technology. In the past, people, in general, obtained information from media such as radio, television and print media. Still, now thousands of times this information is entering the hands quickly through gadgets. The advancement of information technology now makes it easy for people from various walks of life. It is just unfortunate that mediamorphosis opens opportunities for the spread of misused information, for example, such as hoaxes, hate speech, to slander, which is directly accessible to community gadgets without verification.

Cok Raka Darmawan said “In addition, the Government of Badung Regency has also provided 997 location points, and 1,074 free wi-fi access points for all Regional Office Offices, Mangusada Regional Hospital, Sub-District Office, Village and Lurah Offices, Public Health Center, Banjar Hall, Elementary School and Junior High School, tourism objects in Badung”. He said through Fajar Bali.com media, March 13 2019 edition The ease of accessing information at this time is very well utilised to sustain decision making. Information access can be obtained from the latest news and applications that can be accessed via a smartphone. Indonesia is an agrarian country where most of the people pursue agriculture. However, information technology in agriculture has not been utilised properly. This article aims to support the use of information technology media through the application of information technology at the farm level, especially in Badung Regency. The review of the Badung Regency government policy is about improving the quality of intensification, technology and innovation, improvement of infrastructure facilities, efficiency and effectiveness in the use of natural resources and empowerment of human resources in agriculture, plantations, and animal husbandry.

In this case, information technology can facilitate the dissemination of information related to crop yields and harvest quality that can attract the desire of the community to buy crops produced by farmers. In other words, digital media can be used as a media of promotion among the wider community that can capture domestic and foreign communities so that can increase the interest of tourists who want to travel in Bali. The literacy is not only to support agriculture but to support digital marketing that will make tourists not only travel to tourist attractions in general, which makes the farm a place for new tourist destinations by making a neat, beautiful plantation arrangement and attracting attention as a place for recreation for tourists. Badung Regency also has world-famous tourist areas, including Kuta, Jimbaran, and Nusa Dua which are in the South Badung region. Agung said, “Potential of the agricultural sector, among others

in the District of Petang, in the North Badung region. Badung Regent said, the main cultural agriculture and superior cultural heritage agriculture". He said on media of the Agriculture and Food Service.

The information has an essential role in supporting the various activities of each person because the information has become a significant need of every individual. The development of science and technology in various fields has increased the amount of information produced, which is packaged in various forms and can be accessed easily and quickly. This causes an explosion of information and to obtain that information requires information literacy capabilities (Rufaidah, 2013). Information literacy has to do with information technology. Information Technology enables an individual to access information using media such as computers, application software, databases, and other technologies. Information literacy activities will be more easily achieved using information technology (American Library Association, 2000). New media increases the amount of information by a large amount. Still, the emergence of this new media has not been accompanied by the quality of human resources that prioritises cultural values and social values of the community. Flew (2002) states that the use of new media can be understood through three approaches, namely:

1. The first approach is new media in the form of tools used by humans to transform nature, increase social interaction and increase the capacity of human potential.
2. The second approach, new media, is understood according to the context and purpose of its creator related to the content offered or presented in the new media.
3. The third approach, new media as a knowledge system and in its development or use, will form new social and cultural meanings.

Some factors that influence the use of new media by farmers are information quality, system quality, and user convenience (Laranti, 2017; Pradita, 2015). This new media can be accepted and used by agricultural, human resources. It is necessary to have media literacy, and information literacy regarding the use of new media carried out by various parties such as the government, media managers and developers as well as local Balinese community leaders especially in the Badung regency which has agricultural or regional land with agriculture.

There are many things that need to be done to improve agricultural literacy to make farmers more information. Information is important for farmers in Badung because they can improve their way of farming even better. The availability of information must be in the form of farmers' local language. It must be adjusted to suit their age and education level to ensure the shared-best knowledge and practical examples are delivered properly media can increase farmers' information literacy through the use of information technology. That will help farmers and agricultural investors to know which particular products are available in large quantities (Israel et al., 2006; cit Sokoya et al. , 2014). One of the opportunities is to utilise new media such as



the internet or applications in smartphones that can be accessed online. Therefore, researchers are interested in bringing up the research with the title, "Literacy Utilisation of Information Technology for Farmers in Badung Regency, Bali In The Revolutionary Era 4.0" agriculture in the era of the industrial revolution 4.0? What factors hinder the use of information technology policy in agriculture in the era of the industrial revolution 4.0? The general objective of this research is to make a good contribution to the government, community stakeholders, especially farmers to enable the use of information technology in the fields of production, distribution, promotion in agriculture. Specifically, the objectives of this study are to increase the use of information technology in agriculture in the era of the industrial revolution 4.0; and knowing the factors that hindered the use of information technology literacy in agriculture in the era of the industrial revolution 4.0. The benefits of this research are theoretical and practical benefits. Theoretical benefits are to contribute thoughts in the economic, agricultural sectors in the industrial revolution era 4.0, especially for increasing literacy in the use of information technology and the practical benefits of this research as follows.

According to Clercq, M. (2018) best practices for the use of information technology in agriculture and elimination for the use of information technology in production, distribution and promotion in agriculture. A search that was conducted by Hrinta (2011) explained that there are important things that affect the adoption of innovations in agriculture, namely: the influence of nature or characteristics, the effect of risk, communication behaviour, the effect of the decision on adoption of innovations. Az-Zahra et al. (2018) said that social literacy could involve intellectual skills, social skills, cooperative skills, and attitudes and values. Sari et al. (2009) state that the influence of age, level of formal education, the influence of characteristics, and the relative benefits, as well as the complexity of the characteristics of farmers in the adoption of innovation. Deepened by Rehman and Hussain (2016), a prelude to introducing the adoption of modern technology is the importance of use and its role in improving farmers in agriculture. Liao et al. (2018) say that there are two important limitations, the first being the determinant of the government's position in developing infrastructure in innovation, the second as a public policy effort. Deepened by Kobelev (2017), a systematic literature review can identify the most influential public policies and evaluate differences, the main goal, funding in the focused manufacturing sector, and prioritised technology. However, according to William Motes (2010), the beginning of modern agriculture, the key to potential success - more effective control of the many processes it uses, is supported by private and public parties and avoids the isolation inherent in traditional systems. Clercq et al. (2018) said that to showcase innovations, best practices, and smart solutions to overcome future challenges, especially the modern agriculture world. Whereas Nagy et al. (2018) said that the production process is more efficient, and achieves better productivity and economies of scale, increasing economic sustainability.



Methodology

The research uses descriptive method, which is describing the real condition of the subject and object of research. Types of data in this study include, qualitative data in the form of verbal words not in the form of numbers and quantitative data is the type of data that can be measured or calculated directly. Data sources in the form of primary and secondary data. Primary data directly collected by researchers or from their first source. The secondary data is data that already exists in the study site. The research location is located in Badung Regency; specifically, the target area is Mengwi District with consideration of agricultural potential.

Data collection techniques consist of in-depth interviews, observation and document study. Data analysis techniques, carried out with three channels that activities occur simultaneously, namely, data reduction, data presentation, and conclusions. The population and sample in the study were identified with the informant. Determination of informants uses purposive sampling techniques (Matthew B. Miles, A. Michael Huberman, 2016) , where researchers determine the intended party as an informant based on expertise and competence, which consists of elements of government, farmers, netizens, community leaders. To check the validity of the data, triangulation was carried out by utilising the use of sources, methods, investigators and theories.

Results

Badung Regency is one of the regencies in Bali Province, Badung Regency was formerly named Nambangan. Badung's anniversary falls on September 20, the capital city of which is Mangupura, which has an area of 420.09 km². Badung Regency consists of six subdistricts which include Petang District, Abiansemal District, Mengwi District, Kuta District, North Kuta District, and South Kuta District. One of the samples in the Mengawi District, the details of the Mengwi District in terms of an area of 82 Km² if in terms of Population consisted of 57,853 men and 58,421 women with a total population of 2016 of 114,280 people. As for the Mengwi District, there are 15 villages and five villages.

revealed the big challenges faced by farmers in Mengwi sub-district are in accordance with Zhou et al. (2015), namely the aspects of knowledge, technology, economics, and social. Types of products produced by the Mengwi sub-district community according to the three sources that "The main types of products produced by the farmers in the Mengwi District are rice." Mengwi sub-district is known as an agrarian area both historically and geographically and only slightly touched with *palawija* which is a kind of grain and a little flower or a means of ceremonial material and even Hindus since long ago.

From the introduction of the application that can help according to the three speakers that "Farmers in Mengwi District do not know of an application that can support agriculture due to age which causes limited ability to access the application." In addition to the factors mentioned above, there is also a lack of interest in understanding literacy which causes farmers to lack understanding of how to implement IT technology that can actually produce added value. According to Wells (in Heryati et al., 2010, p. 46), there are four levels of literacy, namely performative, functional, informational, and epistemic. Literacy owned by the Mengwi District farmers has not fulfilled these four levels, because farmers have not demonstrated the ability to use IT.

From the use of communication tools according to the three speakers, "In the use of mobile phones, on average farmers only use it for communication such as sending messages and telephones." The factor is certainly from being vulnerable to age and also because they are reluctant to use other information technology because besides it is difficult to understand, apart from that it is also the level of education that is less supportive and because they are trapped in old traditional habits even though previously there has been counselling in collaboration with the District Government Badung related to the application of agricultural technology for millennial farmers. According to (Spitzer, Kathleen L.; Eisenberg, Michael B.; Lowe, 1996) literacy owned by farmers in Mengwi sub-district belongs to image and media literacy while computer, digital, and network literacy is not yet fully understood by farmers.

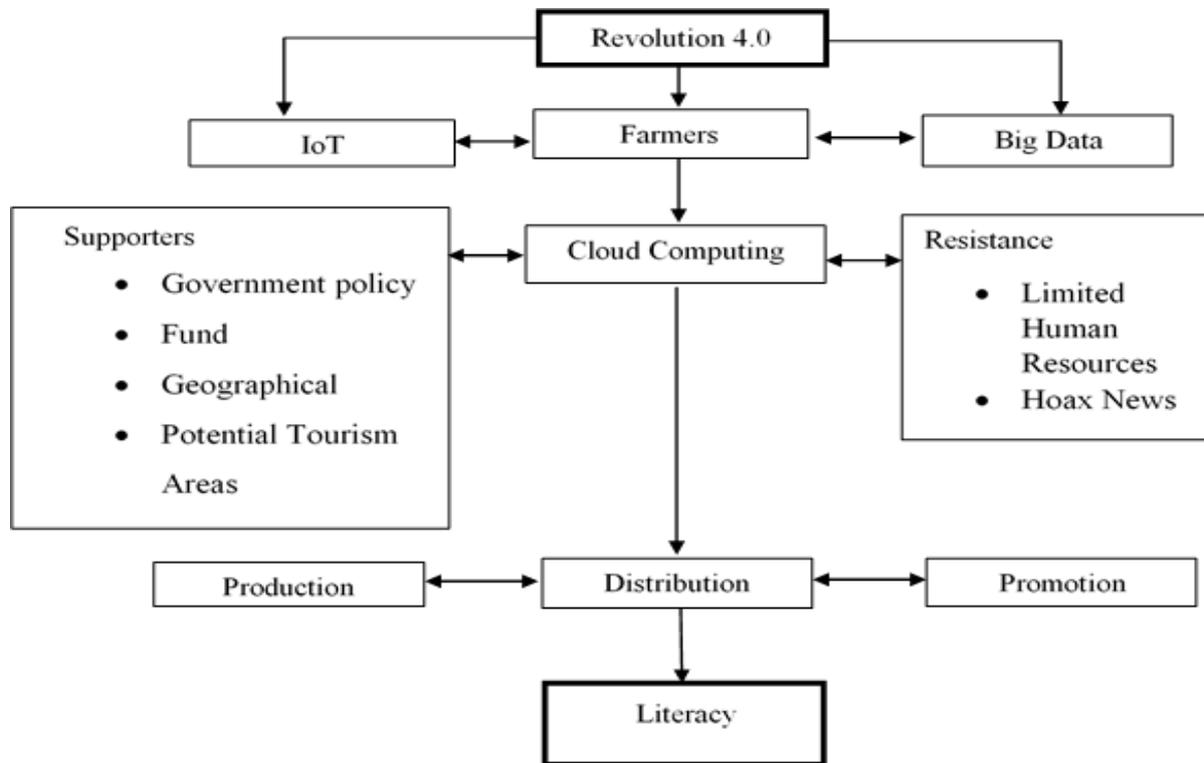
In traditional pattern marketing, according to the three speakers, "Traditional marketing implemented by farmers in Mengwi Regency is marketing to loggers." The urgency of daily needs makes farmers stick with such marketing patterns. However, there is often a unilateral decision to make a price determined by the farmers' loggers experiencing losses. On the other hand, the role of BUMDA in the Mengwi sub-district is not yet effective because it still has limited funds. Farmers in Mengwi Subdistrict are classified as traditional farmers because according (Rahardjo, 1999, p. 63), traditional farmers are dependent and controlled by nature because of the low level of education and technology and the business is aimed at supporting the family (Subawa et al., 2020). This opinion is confirmed that the Balinese people in general still depend on rural credit institutions as economic mobility.



In the constraints of farmers marketing traditionally, according to the three sources, "The constraints experienced by farmers are unstable prices, especially during the harvest season which causes the price determined by the loggers to be low and detrimental to farmers in Mengwi Regency." According to Mardikanto, the determinants of information technology literacy can be done through three approaches, namely: the communication approach, social psychology, and the agribusiness system. Counselling that has been done has fulfilled the three approaches, but in the agribusiness system, especially in terms of marketing, farmers' literacy is not enough. In its development according to the opinion (Subawa & Widhiasthini, 2020) technology can expand the marketing network supported by hegemony that makes social media as the main tool or its application and supported by new public services by the government.

From the existing information technology recommendations, according to the three speakers, "So far there have been no recommendations through supporting or alternative applications, it's just that. The existing technology is only related to planting such as spacing or cropping patterns which give little space for planting or also called *jajar legowo* on the other hand, influenced because of farmers' lack of interest in information from agricultural technology instructors in addition to being said to be complicated but also due to factors -factors age and few young farmers who intervene in the use of information technology, especially in helping agriculture. According to Doyle in Aprianti (2010, p. 11), farmers are said to have good literacy when they have fulfilled eight elements.

Framework 1. Literacy Process Chart 4.0



Elements, whereas farmers in Mengwi District only fulfils one element, namely farmers are able to realise their information needs while seven other elements have not been fulfilled. So that the process needs to be continued and even there is an element of "coercion", which usually can take place quickly, but if through persuasion or education the adoption process takes place more slowly (Soewardi, in Mardikanto, 2000, p. 40), in the sense of being done with better procedures and continuously. In particular, the approach to the extension of youth farmers must be more concerned, especially emphasising understanding optimally. Optimisation of the agricultural sector will be facilitated by the existence of cloud computing where cloud computing is a collaboration between the use of computer information technology and internet-based development. The factors supporting the application of information technology include government policies, funds, geography, and also the potential of the region. However, there are also inhibiting factors such as HR limitations and hoax news that arise amid the rapid development of information. Surely this obstacle is continuously being pursued so that it no longer inhibits the optimisation of IT development in the agricultural sector. The object of the main target of this research is the production, distribution, and promotion carried out by farmers who will be examined from the standpoint of literacy owned by farmers as subjects who process agriculture. As for digital literacy aimed at improving the ability to read, analyse, and use information in the face of the digital world (Big Data), here technology literacy serves to provide an understanding in the workings of machines and technological applications. Human

literacy is shown in improving communication skills and mastery of design science or the like (Aoun, 2017).

However, the intention of individuals in using technology is often influenced by several factors, both usability, economic, and extrinsic (Kwon & Song, 2012); as for the perception of financial costs (Wang, Sy, & Fang, 2010); and perception of benefits (Lee, 2009). On the other hand, sustainable behaviour to adopt technology is determined by a number of backgrounds, such as self-benefit and social norms (White & Simpson, 2013). The existence of a benefit that is obtained by consumers when using technology will lead to sustainable behaviour. In the mechanism, it becomes a perception of the benefits that indicate strengthening the sustainable behaviour of consumers in adopting the technology. From this, it becomes an important role in the perception of benefits as an effort to modernise the relationship and also in relations with sustainable behaviour. The perception of benefits (*perceived benefit*) in this research covers a benefit and usefulness (*utility*) and economic value.

The Concept of Adopting Individual Technology

Technology adoption and diffusion behavior have many points of view on TRA (*Theory of Reasoned Action*) developed by Fishbein and Ajzen in 1975. This explains that what determines individual behavior is individual intentions, which are influenced collectively because of individual attitudes and also subjective norms (Tanoglu, Basoglu & Daim, 2010) - supported by Ajzen in 1991, TPB (*Theory of Planned Behavior*), which includes perceived behavioral control, which determines three types of individual behavior in using technology. In other cases, Hedonist motivation has been included as a predictor in many consumer behavioural studies (Venkatesh et al., 2012) besides that in past research in the context of the use of consumer technology (Brown & Venkatesh, 2005).

In the perception of the use of a consumer context technology, price is an important factor. Where because consumers bear all costs associated with the purchase of the device or service itself. In the context of the use of technology itself, habit is highly proven to be an important factor that influences the use of technology as in the study of Kim and Malhotra (2005). In a different perspective where it is demanded that service providers have to do simple research which is the initial determinant of who the consumer is, age, and also how to understand social and environmental conditions.

Conclusions and Recommendations

Literacy in the use of technology and information related to agriculture in the era of the industrial revolution 4.0 has not been fully implemented. The factors that hinder it are generally divided into two, namely internal factors and external factors. Internal factors include farmer



age, farmers' lack of interest in learning information technology, and the small number of young farmers. This is in line with research (Ajzen, 1991) that a person can decide at will to do or not to do this behavior. Although some behaviors may in fact meet these requirements quite well, performance is largely dependent at least to some extent on non-motivational factors such as the availability of necessary opportunities and resources (eg, time, money, skills, cooperation from others). Collectively, these factors represent people's actual control over the behavior.

Meanwhile, external factors include the lack of training on the application of information technology, while the counseling that has been done is less effective because there is no evaluation. This explains that what determines individual behavior is individual intentions, which are influenced collectively due to individual attitudes and also subjective norms (Tanoglu et al., 2010) - supported by Ajzen in 1991, TPB (*Theory of Planned Behavior*), which includes perceived behavioral control, which determines three types of individual behavior in using technology. In other cases, Hedonic motivation has been included as a predictor in many studies of consumer behavior (Venkatesh et al., 2003, 2016). Improved education related to the use of information technology in agriculture which is associated with the concept of Hinduism in Bali must be done so that farmers have qualified literacy. The proposed education is not only theory based but must also be complemented by practice and periodic evaluation for its application to be effective. The purpose of this counseling is to maximize human resources in Mengwi Regency and provide motivation to young farmers to have the enthusiasm to participate and innovate in agriculture in Mengwi Regency in the era of the industrial revolution 4.0.



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