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Transformation of Information Technology to Improve Human Resources of Farmers in the Indonesian Context: The Role of Farmer Cards

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Abstract. Different approaches in the introduction and socialization of farmer cards resulted in the adoption rate of farmers not following the planned target even though one of the objectives of the farmer card program was to improve farmer human resources. This study aims to analyze the perceived impact of the farmer's card on the level of adoption and improvement of farmer's human resources. Respondents selected based on cluster sampling came from the 6 districts that used the most farmer cards in Central Java. The data obtained through the survey were analyzed using Structural Equation Modeling. The five variables measured consisted of transformational leadership, the role of the government, facilitating conditions, perceived farmer cards, perceived farmer card adoption, and farmer human resources. The results showed that transformational leadership, the role of government, and facilitating conditions had a significant effect on perceived farmer cards. The perceived farmer card has a significant effect on the adoption of the farmer card. Adoption of farmer's card has a significant effect on farmer's human resources. The application of the farmer card results in a farmer database increased accuracy and government services to farmers. Future research needs to be directed at conducting development research related to increasing the capacity of farmer card information technology to make farmers more prosperous.

Keywords. technological innovation, information technology, adoption, farmer card, the role of government

Introduction

The fact shows that information technology (IT) has changed the distribution pattern of ideas or products to be faster, more precise, more comprehensive, and more controllable (Levy & Zaltman, 2005; Zhan & Chen 2021). The Central Java Provincial Government introduced farmer cards as information technology products (Azwar, 2000) to accelerate farmer competence. As a result of unexpected environmental changes, farmers and farmer groups, an informal organization in which most farmers are organized, have to adapt to the new

environment. Adaptation is the ability of an organization to react quickly to take advantage of opportunities and risks and turn them into business benefits (Macmillan & Tampoe, 2000). In this case, adaptation serves as a means to understand the capacity of individuals to constructively regulate their behavior in response to the new environment (Martin, 2012).

However, farmers' reactions are different in response to a new program introduced because readiness for change has not been manageable. In formal organizations, readiness to change is considered a central variable of attitude change (Choi, 2011) and a prerequisite for the successful implementation of changes (Bagrationi & Thurner, 2020). Empirical evidence has shown that readiness to change is a major predictor of resistance to change (McKay et al., 2013), and conversely, change support (Rafferty and Minbashian, 2018). The concept of readiness to change is interesting because employees' reactions to the change play an important role in any change in the organization (Bartunek et al., 2006; Oreg, Vakola, & Armenakis, 2011).

The resistance to change can be observed at the individual, group, organizational level, and many potential factors influence individual attitudes towards change (Rafferty, 2012). At the individual level, factors affecting an individual's attitudes to change can be personal or professional, such as personality, skills and experience, family and cultural background, and personal's context outside of work (Firican, 2020). According to Bejinariu et al. (2017), the highest resistance level occurs in the early stages of change initiatives. It is worth noting that the reason for the change, whether gradual or organization-wide, spontaneous or planned, is constant and serves as a mechanism of adaptation and growth (Firika, 2020).

In agriculture, when the government introduces and promotes a program, in this case, the farmer card, farmers are challenged to have specific competencies to internalize, accept, adapt, and adopt environmental changes (Hendayana, 2014). Farmers' decisions about whether and how to adopt new technologies are conditioned by dynamic interactions between the characteristics of the technology itself and various conditions and circumstances (Loevinsohn et al., 2012). Most adoption studies have tried to measure socio-demographic factors through farmer education, age, experience, and household size (Fernandez-Cornejo et al., 2007; Keelan et al., 2009; Mignouna et al., 2011; Lavison, 2013; Namara et al., 2013). Mignouna et al., (2011) consider household size as an adoption process in which larger households can relax the labor constraints required during the introduction of modern technology.

The internalization process that forms behavioral intentions (Harrison & Samson, 2000) so that farmers are ready to adopt seems to be perceived differently. Governments tend to approach the process of internalizing farmer cards as mandatory (Fichman & Kemerer, 1997; Orlikowski, 1993), whereas, from the perspective of the extension approach, farmers have the right to adopt or not adopt (voluntarily) (Rogers, 2003; Van den Ban & Hawkins, 2003). This condition has long been discussed among researchers with inconclusive results.

Regarding the case of Kartu Tani, differences in the internalization process of IT innovation, according to the theoretical framework of Rogers (1983, 1995) caused by the attribution of perceived innovations, which is very closely related to the perceived level of adoption, has been tested empirically as an independent variable by many researchers such as Davis (1989), Adams et al. (1992), Agarwal and Prasad (1997), Chau and Tam (1997).

However, previous research revealed that the predictive characteristics of perceived innovation tend to vary following differences in innovations (He et al., 2006). Meanwhile, in studying the relationship between perceived attribution and adoption, Agarwal and Prasad (1997), Chau and Tam (1997), Moore and Benbasat (1991) place innovation adoption as the dependent variable.

Based on this description, this study analyzes the influence of leadership, the role of the government, and facilitating conditions on the perception of farmer cards and farmer competencies through farmer card adoption. Therefore, this study aimed to analyze the effect of the farmer's card perception on the competence of the farmer through the application of the farmer's perception card.

Literature Review

Transformational Leadership

Burns (1978) defines the transformational leadership concept as a process in which leaders and followers help each other. This theory was developed and further developed by Bass and Avolio (1990) so that it can be used as a survey instrument to assess transformational leadership. Transformational leadership discusses how leaders in two-way communication make followers and subordinates aware of and accept the goals and mission of the organization by developing an emotional connection with their followers, increasing their awareness, and achieving goals that are higher than their interests. Furthermore, Bass and Avolio (1990) explained that transformational leaders have four dimensions; ideal influence, inspirational motivation, intellectual stimulus, and individual considerations.

In their research, De Jong and Den Hartog (2007), Raja and Palanichamy (2011) suggest that transformational leadership emphasizes organizational learning and employee creativity skills because they contribute to innovation. In addition, transformational leaders potentially influence employee perceptions by leveraging human capital (Birasnav, Rangnekar, & Dalpati, 2010), resulting in high return on investment, opportunities to participate in high-profile projects, and increased status and authority (Motley, 2007).

The Role of Government

When a technological innovation program is designed to be implemented by farmers, the government sets a target for achievement within a certain time unit (Directorate General of Agricultural Infrastructure and Facilities, 2013). At the pre-adoption stage, the government's role in the form of policies, rules, and legislation has a positive effect on innovation adoption (Aarons et al., 2011; Oldenburg & Glanz, 2008; Rogers, 2003). Furthermore, the application of laws and regulations, as well as accreditation standards, have an impact on increasing adoption (Aarons et al., 2011; Berta et al., 2005; Feldstein & Glasgow 2008; Mitchell et al., 2010), especially if they have cultural and political support (Glasgow et al., 2003).

In fact, according to Gopalakrishnan and Damanpour (1997), adoption within the organization (in the context of the farmer card, this organization is a non-formal organization of farmer groups that become the government's "channel" in introducing a program) occurs during the initiation and implementation stages of innovation. At the initiation stage, the organization becomes aware of the innovation, forms an attitude to accept it, and then evaluates

the new technology or idea (Gopalakrishnan & Damanpour, 1994); The initiation stage includes the stages of awareness, consideration, and intention. The innovation process can only be considered successful as long as the innovation is accepted and integrated into the organization (Rogers, 1995; Gopalakrishnan & Damanpour, 1997) and the individual adopters demonstrate a commitment to continue using the technology within a certain period which is referred to as intra-organizational innovation acceptance (Bhattacharjee, 1998). However, Rogers (1995), Ram and Jung (1991), who expressed their opinion from a pessimistic point of view clarified that the use of innovations at the individual level in organizations is tentative and dependent on organizational adoption decisions, which are referred to as "contingent innovation decisions" or "forced adoption."

Facilitating Condition

Facilitating conditions are defined as the extent to which a person believes that the organizational and technical infrastructure is available to support a system (Jogiyanto, 2007). According to Fiddin, Kamaliah, and Hardi (2013), conditions that facilitate increasing individual confidence that organizational infrastructure and technical and non-technical support from experts in operating systems in an organization are adequate to encourage individual's interest in using existing systems within the organization. For example, in their research, Thompson, et al. (1991) added a variable of use influence that affects the intention to use personal computers. The purpose of using computer technology ultimately affects the behavior of using the technology. In terms of utilization and use of a system, factors supporting the use of the system are conditions that facilitate, such as training on the use of the system.

This limitation is in line with the restriction used by Thompson (1997), which stated that the construct of facilitating conditions is an objective factor in the environment that facilitates an action to be carried out. Each of these constructs is operationalized to include aspects of the technological or organizational environment designed to remove barriers to using the technology. In the context of adopting farmer card technology, facilitating conditions (available fertilizer allocation, EDC in KPL, and Active Farmer Card) will encourage the use of transactions in the adoption of farmer card technology.

Perceived Farmer's Card

Perceived innovation, perceived adoption rate, and adopter behavior (Rogers, 1983, 1995) were correlated (Adams et al., 1992; Agarwal & Prasad, 1997; Chau & Tam 1997; Davis 1989), although the characteristics of the perceived innovation were different functioning as predictors tend to vary in distinctive innovation (He et al., 2006).

In recent years, the adoption of information technology innovations has attracted the attention of researchers, especially on the factors that influence adoption decisions (Venkatesh & Brown, 2001). Rogers's theory of diffusion of innovation (1983, 1995) is often cited by researchers studying adoption and diffusion of information systems and information technology (Adams et al., 1992; Agarwal & Prasad, 1997; Chau & Tam, 1997; Davis, 1989; Premkumar, Ramamurthy, & Nilakanta, 1994). However, there are differentiating factors that have not been widely used as the focus of research, which are the adoption of information technology

innovations (perceived farmer cards) at the level of non-formal organizations (farmer groups) with an emphasis on output, in the form of increasing human resources of the farmers.

Adoption of the Perceived Farmer's Card

Rogers's (1983, 1995) relational model shows that the level of adoption is influenced by relative advantage, compatibility, complexity, trials, observations that provide practical implications, and analytical guidelines for research on innovation adoption, but the effects on each of these attributes are different. Relative advantage is one of the best predictors of innovation adoption rates, while comparative compatibility is less important in predicting adoption rates (Rogers, 1995). In contrast, relative advantage and compatibility are usually but not always consistently associated with positive levels of adoption, and complexity is negatively associated with adoption rates (Tornatzky & Klein, 1982).

In Rogers (1995), the level of innovation adoption is the dependent variable, while some researchers such as Agarwal and Prasad (1997), Chau and Tam (1997), Moore and Benbasat (1991) put the adoption or utilization of innovation as the dependent variable in studying the relationship between perceived attributes and adoption. The researcher's findings underlie the idea of adopting farmer cards which are perceived as the dependent variable.

Some researchers suggest that intention models or behavioral decision theory from social psychology can provide a basis for research on IT adoption by firms and IT use by individuals (Harrison et al., 1997). In addition, the theory of planned behavior (Ajzen, 1988; Ajzen, & Madden, 1986) reveals that attitudes toward behavior, subjective norms, and perceived behavioral control determine actions. The predictive power of attitudes toward actual behaviors is supported by empirical studies (Mathieson, 1991). In this sense, the perception of decision-makers is an effective predictor and explanation of decision-making behavior.

Many researchers are inspired to study the adoption and use of innovations in the relationship between attitudes and social behavior (Bhattacharjee & Premkumar, 2004). For example, Davis (1993) applies attitude theory to study why users accept or reject information systems and how user acceptance is affected by system design features. Harrison et al. (1997) applied the theory of planned behavior to explain and predict the decision of small business executives to adopt information technology. In addition, Karahanna, Strub, and Chervany (1999) combined innovation diffusion and attitude theory in a theoretical framework to examine differences in pre-adoption and post-adoption beliefs and attitudes towards IT innovation. The results of this study confirmed the effectiveness of perceptions and attitudes in predicting and explaining the prospective adopters' acceptance.

Human Resources of the Farmer

Pasmore (2011) stated that changes in an organization are often caused by business growth, innovation, globalization, complex regulations, competition, and consumer preferences, all of which, in turn, affect employee performance. When the strategic environment changes, employees may become stressed, confused, frustrated, and even frightened. Such changes can harm employees, including attitudes and performance. However, often efforts to manage change are mostly focused on structural interventions (Armenakis & Harris, 2009), and

employee problems are often overlooked, as they are part of the decisions taken by top management.

Bernerth (2004) and Eby et al. (2000) explain that understanding individual perceptions of the work environment such as how employees perceive organizational actions (e.g., organizational support) that affect their work and performance is very important. Ultimately, employees are responsible for implementing change in the workplace, and individual perceptions and differences are likely to play an important role in this process. Organizations expect employees to maintain positive work attitudes and high levels of performance by learning new skills and procedures. The ability to drive the power for change in an organization is highly dependent on the extent to which employees are open, dedicated, and motivated to change.

Whenever a leader operationalizes a change, employees will react to the change. If employees misinterpret the leader's idea of implementing change, they may experience an uncertainty about the specific behaviors required to achieve the desired change (Sonenshein, 2010). As a result, tension can increase as employees attempt to learn new work routines while maintaining their previous level of performance.

The Effect of Transformational Leadership on the Perceived Farmer Card

Transformational leaders are an energizing energy source for work-related empowerment initiatives (Wang, Demerouti, & Le Blanc, 2017) to trigger career development, work-related information, knowledge, and experience. Consequently, leaders should be open and willing to share with employees every aspect that stimulates transformational interactions (Wang et al., 2005). Transformational leadership is a strategic antecedent for organizational capacity development and the basis for encouraging interaction, especially in renewable organizations (Tseng & Lee, 2014).

The transformational leader, as the influential change agent, visualizes and inspires subordinates to achieve the newly developed future (Vera & Crossan, 2004) and the need for change to be carried out through adaptation to accomplish the challenging goals of the changes occurring in the organization (Bass, 1990). In cooperation with employees, they seek to encourage creativity, change, experimentation, and risk-taking (Mittal & Dhar, 2015). The adaptive performance involves the ability to work creatively and learn new skills, the capacity to manage stressful situations, and the ability to accommodate diverse social contexts (Han & Williams, 2008; Pulakos et al., 2000). This capacity must be well-handled by transformational leaders by providing the basis for long-term organizational change that facilitates access to the organizational systems for higher purposes.

In this study, organizational change is analogous to a farmer group faced with innovation, named the farmer card. The farmer group leader directs the farmers to adapt to changes and adopt new programs by promoting a new perception of the farmer card. Thus, the proposed hypothesis is:

H1: Transformational leadership has a positive effect on the Perceived Farmer Card.

Transformational leadership has a positive effect on the Perceived Farmer Card

The role of the government in utilizing the existence of information technology is very important because, according to Sanja Marinkovic, Jovanna Rekicevic, Maja Levi Jaksic, (2016), the government plays an important role as one of the key factors for the success of technology adoption. In line with that, Fagerberg and Srholec (2007) suggest that countries that have succeeded in developing and maintaining capabilities and managing innovation systems and supported by government systems will benefit positively from the use of technology. In the pre-adoption stage, policies and regulations positively affect adoption, specifically related to innovation adoption (Aarons et al., 2011; Rogers 2003). At the adoption stage, legislation, regulation, and accreditation have an impact on increasing adoption (Aarons et al., 2011; Berta et al., 2005; Feldstein & Glasgow 2008; Mitchell et al., 2010). Therefore, the proposed hypothesis as follows:

H2: The Government's role has a positive effect on the Perceived Farmer Card.

Effect of Facilitating Conditions on Perceived Farmer Cards

The availability of technical and organizational infrastructure supports the systemic perception and sensory information of an organization. (Oskamp & Schultz, 2005). According to Umstot (1988), perception is the process of filtering, organizing, and interpreting information from the environment. The higher a person's perception of the ease of using the system is, the higher the level of utilization of the information technology (Igbaria, 2000).

Thus, the conditional variables that facilitate the perception of technology that have indicators of acceptance of facilitation, availability of information, and availability of facilities and infrastructure indicate individual readiness to change due to innovative technology. In other words, adequate facilitation, individual readiness to change, and the level of user confidence that the available organizational and technical infrastructure is intended to support the use of technology will increase the adoption of technological innovations; in this case, is farm card technology.

On the other hand, Venkatesh et al. (2003) stated that the facilitating condition variable had a significant effect on the use of information technology only if it was moderated by age and experience. Thompson et al. (1991) identified that facilitating conditions did not affect computer use. In this case, Thompson et al. (1991) examined respondents with highly educated employees in national companies. While the educational background of most of the respondent farmers in this study did not graduate or complete elementary school.

H3: The Facilitating Condition has a positive effect on the Perceived Farmer Card.

The Effect of Perceived Farmer Cards on Perceived Farmer Card Adoption

Wang et al. (2014) stated that the perception of the usefulness of new technologies has a significant positive effect on behavior. Meanwhile, Sun (2003) and Gardner (2004) stated that the use of technology is the most important factor influencing user acceptance. According to Rogers (2003), the perception of technological innovation is related to relative advantage, level of suitability, level of complexity, ease of experimentation, ease of observation, and visibility.

From the point of view of Baron and Bryne (2000), failure to adopt information technology will result in organizations experiencing competitive losses because they are unable to adapt to environmental changes. Nijssen and Frambach (2000), Maylor (2001), Cooper and Edgett (2008) state that innovation will have a significant impact if the adoption of information technology goes well because information technology innovation is able to transform and develop ideas, knowledge, and technology so that they are beneficial to human resources (Brambor, Clark, & Golder, 2006). Therefore, the proposed hypothesis is:

H4: The perceived farmer card has a positive effect on Farmer Card Adoption.

The Effect of Perceived Farmer Card Adoption on Farmer HR

Information technology must be used appropriately and suited to the tasks (Thompson, 1997); so that it generates an impact on individual performance (Lucas & Spitler, 1999). The utilization of information technology can be measured from the intensity of use, frequency of use, and the number of applications or software used (Thompson et al., 1991).

According to Mangkunegara (2000), performance (work achievement) is the result of work in quality and quantity achieved by an employee in carrying out his duties following the responsibilities given to him. Mink (2003) expressed his opinion that individuals who have high performance have several characteristics, namely: (a) achievement-oriented, (b) self-confidence, (c) self-control, and (d) competence.

Joshi (1991) further stated that the successful application of modern innovative technology and management science is essential in increasing productivity and the competitive position of an organization. Karahanna et al. (1999) supported this statement and stated that the adoption process and use of information technology are significant to get benefits from information technology. Therefore, the proposed hypothesis is:

H5: The implementation of the perceived farmer card has a positive effect on human resources of farmers.

Methodology

This quantitative research was conducted using probability sampling and cluster sampling on the population who adopted farmer cards and had transactions above 30% from 35 districts/cities in Central Java Province. After analyzing the number of respondents 300, and the number of indicators used was 26.

Data were collected using questionnaires and in-depth interviews. A five-point Likert scale, from 1 = strongly disagree to 5 = strongly agree, was used. Data were analyzed using Structural Equation Modeling (SEM) combined with AMOS application. The validity and reliability tests were carried out to analyze the total correlated items.

Table 1. Research Sampling

No.	District	Sub-District	Sample
1	Temanggung	Ngadirejo	60
2	Purbalingga	Kutasari	60
3	Banyumas	Sumbang	60
4	Wonogiri	Girimarto	60
5	Karanganyar	Mojogedang	60
Total			300

Source: Primary data, processed

Results and Discussion

CFA (Confirmatory Factor Analysis) was used to determine the indicators of the model. The CFA series shows the strength of each indicator in explaining the variables. From the CFA test, the expected loading factor of every indicator was > 0.5 , but the results showed that there was no indicator of the Loading Factor value of less than 0.5. Therefore, all indicators of the model can be used to predict the variables. After conducting the CFA pre-test, a full estimation of the structural model was carried out, and the test results are presented in Figure 1.

Figure 1: Full Estimation of Structural Model

To test the accuracy of the model, the Fit Index Model was used and the results are presented in Table 2.

Table 2. Fit Index Model

Goodness of Fit Index	Cut off Value	Result	Conclusion
Chi Square df =144	< 387.4	245.799	Fit
Significance Probability	≥ 0.05	0.000	Fit
RMSEA	≤ 0.08	0.049	Fit
GFI	≥ 0.90	0.93	Fit
AGFI	≥ 0.90	0.887	Marginal
CMIN/DF	≤ 2.00	1.707	Fit
TLI	≥ 0.90	0.966	Fit
CFI	≥ 0.95	0.977	Fit

Source: Primary data 2019, processed

The fit model index shows that the overall test criteria are in good category and meet the assessment criteria required or determined because the Chi-Square value is 245.799, and the critical value/Chi-Square table with df = 144 is 387.4. Because the Chi-Square calculated value is smaller than the table value, the research model does not differ from the population/model estimate, so it is accepted.

As shown in table 3, the results of the SEM regression estimation show that all variables are positive and significant. In other words, all hypotheses in this study were accepted.

Table 3. Regression Estimates

Variables			Estimate	SE	C.R.	P	Note
Perceived Farmer Card	<---	Transformational Leadership	0.280	0.076	3.674	***	Significant
Perceived Farmer Card	<---	The Role of the Government	0.224	0.070	3.183	0.001	Significant
Perceived Farmer Card	<---	Facilitating Condition	0.261	0.091	2.855	0.004	Significant
Adoption of Farmer Card	<---	Perceived Farmer Card	1.356	0.134	10.144	***	Significant
Farmers Performance	<---	Adoption of Farmer Card	1.209	0.078	15.408	***	Significant

Source: Primary data 2019, processed

The impact of leadership on technology perception has a regression weight of CR = 3.674, probability 0.000 at <0.05 . Thus, the transformational leadership variable proved to have a significant effect on the perceived farmer's card. The introduction of innovation to farmers created environmental changes and farmers' readiness to change that had to be managed by the leader of the farmer's group. (1) Assessing farmers' readiness for change (Weiner, Amick, & Lee, 2008); (2) Adjusting and planning strategies to suit the needs (Armenakis, Harris & Feild 1999) of the farmers; (3) motivate, assist, and share knowledge, skills, experiences (Tseng & Lee, 2014; Li & Yuan, 2017) to achieve a better life. In line with the findings of this study,

Abbasi (2017), Holt et al. (2007), Miller et al. (2006), Hussami et al. (2017) suggest that transformational leadership significantly and positively affects readiness to change. Herold et al. (2008) stated that transformational leadership influences followers' commitment in the forms of inevitably change initiatives as the function of the impact of personal change.

The government's role test on technology perception resulted in the value of CR Regression Weights = 3.183, probability = 0.001 at <0.05 . Thus, the role of government variables is proven to have a significant effect on technology perceptions. This finding shows the important role of the government regarding farmer adoption in the use of farmer cards. According to Rogers (2003), technology adoption gives the adopter the freedom to determine whether a technology will be adopted or not; completely depends on the decision of the adopter. The findings of this study follow up the suggestions put forward by Indrianingsih (2011); Syahputra (2012); Rifki (2014) that the role of government is an independent variable that needs to be observed. Holt (2007) suggested that readiness to change is a comprehensive attitude simultaneously influenced by the content, process, context, and individuals involved in a change. Meanwhile, Netto et al. (2016) stated that external factors in the adoption process in rural areas have a positive contribution to agricultural development, while Larrasquet et al. (2016) argued that adopters need understanding and principles in the technology adoption process. Thus, the dimensions of the government's role consisting of socialization, training, and counseling can provide changes to the perceived farmer card technology.

The influence of conditions that facilitate the perception of technology shows the value of CR Regression Weights = 2.855, probability = 0.004 at <0.05 . Thus, the facilitating condition variables significantly and positively affect the perceived existence of technology. These findings suggest that the availability of technical and organizational infrastructure supports the systemic and organizational perception of sensory information about people or social situations (Oskamp & Schultz, 2005). According to Umstot (1988), perception is the process of filtering, organizing, and interpreting information from the environment. The higher a person's perception of the ease of using the system is, the higher the level of utilization of the information technology (Igbaria, 1997).

On the other hand, Venkatesh et al. (2003) stated that the facilitating condition variable had a significant effect on the use of information technology only if it was moderated by age and experience. Thompson et al. (1991) identified that the facilitated state did not affect personal computers. In this case, Thompson et al. (1997) examined respondents with highly educated employees in national companies. While the educational background of most of the respondent farmers in this study did not graduate or complete elementary school.

The effect of technology perception on the adoption of farmer card use shows that the value of CR Regression Weights = 10.144, probability = 0.000 at <0.05 . Thus, the technology perception variable proved to have a significant effect on farmer card adoption. The significance of H4 shows that the perceived technology perception variable and the perceived adoption of farmer card use that have a significant effect can be explained by the adoption of farmer card technology used where individuals interpret certain objects in different ways by using their senses and interpreting them. In this case, Desmayanti (2012) suggests that perceived usefulness is defined as how individuals interpret the usefulness or benefits of using the system. Wang et

al. (2003) found that the perceived usefulness of innovative technology had a significant positive effect on behavioral interest. Sun (2003) also emphasized that the use of technology is the most important factor in influencing user acceptance. This finding is also in line with the findings of Wang et al. (2003), Sun (2003), Oskmap and Schultz (2005), who examined perceptions, namely the reception and organization of sensory information about people or social situations, showed that the perceived influence of technology on the adoption of farmer card use was based on their interpretation of card information technology farmers used in the agricultural sector.

The effect of technology perception on the adoption of farmer card use shows the CR value of regression weight = 15,048, probability = 0.000 at <0.05 . Therefore, H_0 is rejected, and H_5 is accepted. Thus, the application of the farmer card variable proved to have a significant effect on the performance of farmers. The finding supports several studies focusing on individual characteristics in the HR management sector. For example, Colombo and Grilli (2005), Li, Zhao, and Liu (2006) found that the quality of the workforce is very important in organizational performance for the production sector, and is also very important for the human resource management sector because high-quality HR managers contribute to HR performance. Factors related to nature are for example personal characteristics, work motivation, gender, and emotional intelligence (Belfield & Marsden, 2003; Verhofstadt, De Witte, & Omey, 2007). The results of this study also support the findings of Delaney and Huselid (1996, 2003) and Becker et al. (2004) there is a positive relationship between an organization's strategic human resources and their performance, and human resource input plays an important role in increasing organizational competitiveness (Barney, 2007, 2003). Substantial research was conducted on human resources, and their implications for organizational performance were discussed extensively, and clearly, increased human capital results in greater competitiveness and performance (Agarwala, 2003). There is a growing consensus that the effective deployment of human resources is critical to organizational success (Barney & Wright, 1998; Akhtar et al., 2008). Hitt et al. (2001) also found a positive linear relationship between improvement in human capital and financial performance among law firms.

To protect and empower farmers, the government needs data provided by the central statistics bureau, field technicians, as well as other sources. However, the data is often different and not updated. As a result, because precise data are not available, government assistance is often not well targeted; For example, fertilizers are often misused, and farmers often do not get fertilizers that meet their needs. In 2015, the Central Java Provincial Government developed a program called the farmer's card to facilitate the distribution of subsidized fertilizers to meet the exact amount, type, time, place, and target. In practice, the farmer card also functions as a farmer database. This program is in line with the findings of Shaofen and Guoqing (2003). They stated that farmer card functions to empower and protect farmers. Therefore, the data of all farmers are recorded and updated every month following the dynamic condition of the farmers. Thus, the farmer card can also function as an agricultural information center (Kiplang'at, 1999).

In addition, as a database, farmer cards ensure the accuracy of farmer data in real-time so that decision-makers have a basis in identifying, designing, and implementing agricultural development programs. Thus, the subsidies given to farmers will be accurate by using farmer

cards based on RFID information technology (Liu, Zang, & Li, 2011), including reducing problems that arise in the distribution of subsidized fertilizers (Djamaludin 2018). As a result, the implementation of the farmer card improves the services provided by the government related to the distribution of subsidized fertilizers and education programs; In addition, farmer cards can be used for agricultural extension activities (Tavernier et al., 1996; Picciotto & Anderson, 1997). Because extension workers can access data on farmers' business conditions through farmer cards, they can easily provide extension services according to farmers' needs.

Furthermore, farmer card helps the government to provide technological facilitation, seeds, compensation, prices, and income subsidies so that farmers' production and welfare can be better. In addition, the farmer's card ensures the identity of the farmer's profession and the legal rights of the farmer. Previously, the legal rights profession of farmers has not been recognized; even farmers lost to the need for factories. Farmers are not categorized as entrepreneurs, SMEs, and employees. Before the law, the profession of farmers has no legality. For instance, they have adequate status because most of them are poor and underdeveloped. Therefore, with the farmer card, the farmers are clearly defined who they are.

Conclusion

The farmer card adoption model is influenced by leadership, condition of information technology facilities, and the role of government, all of which are mediated by farmers' perception of farmer card technology. From these five variables, the leadership variable is the result of a combination of variables measuring social support and farmer group dynamics. The latent variable of leadership has been realized with the support of the group leader and the village government.

The farmer card also functions as a farmers' database so that farmers' empowerment and protection are easy to be carried out; the accuracy of farmer data in real-time is guaranteed; identifying, designing, and implementing agricultural development programs is easy for decision-makers. In addition, the government services to farmers can be improved, not only for the distribution of subsidized fertilizers, but also for education programs, technology facilitation, seeds, compensation, and price and income subsidies for farmers. In addition, the farmer's card can confirm the farmer's professional identity and the legal identity of a farmer.

The application of farmer card information technology still has weaknesses. Farmers are still reluctant to use it because there is not much profit except for subsidized fertilizer redemption.

This study uses a quantitative approach, even though the adoption of the farmer card technology innovation includes social interactions that will be closer to the truth if an extensive in-depth interview is carried out. One aspect that the interviewer must pay attention to is the local culture trusted by the informants. For example, Javanese culture is influenced by the "sanepa" culture (stating ideas implicitly). Thus, the interviewer must prepare proper materials and techniques following the culture/culture of the informant group. The unit of analysis of this research is farmers and farmer groups, while the process of adopting technological innovation, in this case, the farmer card, involves various elements, skills, attitudes, and behaviors of farmers as

beneficiaries, extension workers, KPL, BRI, and the government which takes place continuously.

Future research needs to consider the application of qualitative methods or mixed methods in exploring the process of adopting technological innovations, both agricultural-based technology, and information-based technology because the research subjects still hold communal and paternalistic agrarian culture. Theory of Rogers that used in this study did not thoroughly explain the influence of the variables of perception, attitude, and behavior. It has not also responded to the environmental changes due to technological innovation exposure. Thus, although not complete, the findings of this study can empirically modify the theory developed by Rogers in the context of technology adoption. The process of adopting a technology innovation in the context of agricultural development involves various sectors and sub-sectors, one of which is financial institutions and banking. For this reason, the study of the role of financial institutions/banks as providers of information technology in the adoption of farmer card technology needs to be investigated more deeply.

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