
COMMUNICATION IDENTITY OF MAIZE FARMERS IN THE DIGITAL IMMIGRANT GROUP IN ACCEPTING INNOVATION THROUGH THE UTILIZATION OF DIGITAL PETANI APPS

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ABSTRACT

The development of digital technology has brought significant changes in the agricultural sector, including through the peTani Apps digital application that is expected to help farmers. However, adopting this technology is not always easy, especially for farmers in the digital immigrant group. This study aims to identify and examine the process of forming a communication identity of corn farmers in the digital immigrant group who accept innovations through digital peTani Apps. The research method used is descriptive qualitative with a case study approach processed and analyzed using NVivo. The research applied Michael Hecht's Communication Theory of Identity (CTI) in farmers' interaction with new technology. The results showed that farmers' communication identity levels, including personal identity, enactment identity, relational identity, and communal identity, play a significant role in technology adoption. Personal identity resulted in the finding that many farmers felt insecure and inexperienced in using advanced technology, which led to discomfort in using the application. Enactment identity shows that peTani Apps' digital technology innovation has not become part of farmers' daily routine due to difficulties in navigation and understanding functions. Relational identity reveals that community support and social relationships are crucial in adoption. Communal identity reflects resistance to change in communities with strong traditional norms. Overall, the app has not been widely adopted by digital immigrant groups. Social, cultural, and economic factors influence the adoption rate of these technologies, so more targeted strategies and greater support are needed to encourage equitable adoption among farmers.

Keywords: Communication Identity, Digital Immigrants, Maize Farmers, PeTani Apps, Technology Adoption.

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INTRODUCTION

The rapid development of technology in recent decades has fundamentally changed the landscape of social life. The basic principle of technology is that it is a tool or Extension of human capabilities designed to support life around the world. Today, technology has developed into a force capable of shaping human lifestyle and behavior. According to Nasution (in Januarti et al., 2018) the importance of technological progress lies in every innovation produced to have a positive impact on human life and open up new ways of carrying out various activities. In Vodea (2023), digital technology products that are very useful for business are mobile apps that are able to provide benefits in terms of promoting products, conducting sales transactions, and becoming a media communication channel.

But in today's digital era, being able to process information through mobile apps also requires the support of an internet connection so that information can be spread efficiently throughout the world. The Internet is a network that connects most of the computers in the world into one network

(Fatirul, 2020). Interestingly, Indonesia is the fourth largest country with internet users in the world. (Yonatan, 2023). Based on data obtained by We Are Social and Meltwater, 353.8 million Indonesian users access the internet via mobile phones (smartphones), and 212.9 million internet users throughout Indonesia (Aryanto, 2023).

By 2022, We Are Social reports that the number of internet users in Indonesia will reach around 202 million people. This represents an increase of around 10 million users or about 5% from the previous year. The latest data as of January 2023 shows that Indonesia's total population is estimated to reach 276.4 million people, an increase of 1.8 million people from the 2022 total. Thus, internet penetration in Indonesia currently reaches around 77% or around 212.9 million people. The advancement of information has a significant impact on the development of technology. Given the importance of information in the digital era, the growth of internet connectivity and the number of internet users in Indonesia is very important. Therefore, internet usage is a potential source for companies to incorporate the various functions offered by smartphones.



Figure 1. Data on Indonesian Internet Users as of January 2023

Source: We Are Social and Melwater 2023

Technology is no longer just an additional element in daily life but has become an integral part of every aspect of people's lives, including the agricultural sector. According to Prof. Tualar, Indonesian farmers must have a digital mindset (Maulana, 2022). In his view, the farming profession today is no longer a job that involves hard work on the farm but a profession that can optimize the development of information technology to increase productivity in agriculture. The Minister of Communication and Information Technology, Rudiantara, stated that many of the problems faced by farmers can be overcome through the application of mobile technology. He emphasized that technological advancements need to be widely utilized by the entire community, and the government needs to encourage farmers and Micro, Small, and Medium Enterprises (MSMEs) in Indonesia to go digital.

As reported in Republika.co.id news, the Minister of Agriculture, Syahrul Yasin Limpo, emphasized that the agricultural sector has a central role in shaping a strong economy. He argues that agriculture is the most effective sector in driving the community's economy and increasing the sustainability of national development (Amanda, 2020). Data from the Central Statistics Agency (BPS) confirms this: the agricultural sector makes a significant contribution to Indonesia's economic growth. The agricultural sector has an important role in the recovery of Indonesia's national economy by contributing 14.3% to GDP in the third quarter of 2020 (Perwitasari, 2022). The

agricultural sector grew by 1.35% over the same period, demonstrating its continued contribution to economic growth, making it a key pillar supporting national food security and sovereignty.

PT Syngenta Indonesia is a company engaged in agriculture, especially corn crops. According to Sulaiman et al., (2017) corn has an important role in the national economy and is the second largest contributor to GDP in the food crop subsector after rice. Corn is the main food crop and has developed into a superior agricultural product (Edy, 2019). In general, corn is not only used as a food substitute for rice but is also needed to meet the needs of animal feed. Maize is the main source of carbohydrates and protein after rice. In addition, maize is also used as a basic ingredient in the food industry, feed industry, and fuel production. Therefore, maize has a strategic position among food crops, has economic value, and has the potential to be further developed.

In Indonesia, corn is used in poultry feed formulations. The use of corn in Indonesian poultry feed formulations ranks first by contributing 64%-70.5% of poultry metabolic energy requirements. The remaining 30%-36% comes from feed ingredients such as soybean meal, corn gluten meal, meat and bone meal, and premixes which are sources of protein and other nutrients Saragih et al. (2023)

Table 1. Common Formulations of Poultry Feed

No.	Feed Ingredients	Proportion (%)		Availability	Description	
		Broiler	Layer		Broiler	Layer
1	Corn	45	40	Local		
2	CPO (Fat)	5	4	Local		
3	Bran/Bran, etc.	5	5,8	Local	64%	70,5%
4	Palm kernel meal/PKM	4	6	Local		
5	Vitamins, Minerals (Stone Flour, Stone Seeds)	5	14,7	Local		
6	Soybean Meal	25	17	Import		
7	MBM	4	4	Import	36%	29,5%
8	DDGS	2	2	Import		
9	Other Imported Materials (CGM, HCFM, dll)	5	6,5	Import		

Source: Saragih et al., (2023)

Maize in Indonesia has a multifunctional role and is now the second strategic agricultural commodity after rice. According to data from the National Food Agency (2023), about 75.42% of the total national maize demand in 2022, reaching 12.27 million tons, was used for feed. This amount increased by 25.42% compared to the previous year, which was around 9,786,563 tons for feed needs in 2021. Maize as a food commodity is one of the national strategic commodities that continues to expand its development to meet domestic needs. It is also directed as a major export commodity (Sulaiman et al., 2017). However, maize farming, as one of the main pillars of food in Indonesia, faces complex challenges, such as climate change, price instability, and the need to increase productivity.

In facing the complexity of these challenges, the agricultural sector in Indonesia has responded with the adoption of digital technology. Digital transformation, particularly through digital agricultural applications, is a reliable solution to increase the productivity and efficiency of maize farming. Based on previous data obtained from We Are Social and Meltwater (2023), more than 202 million Indonesians are connected to the internet. This creates a huge opportunity for the utilization of digital applications in the agricultural sector. In the process of digitizing various services, PT Syngenta Indonesia, as a company that focuses on agricultural solutions, faces the opportunity to integrate technological innovations to increase the productivity of maize farming. Coordinating Minister Airlangga stated that a key element for sustainable agricultural development in the future is

to improve the quality of farmers. The main focus is to encourage the growth of productive young farmers with the support of training and the application of production technology innovations in the agricultural sector (Limanseto, 2021).

Technology plays an important role in bringing agriculture to a more efficient and sustainable level (Astuti, 2019). In this context, the utilization and application of modern agricultural technology are key to increasing productivity and efficiency, thus supporting Indonesia's agricultural development towards sustainable agriculture. According to Fatchiya et al. (2016), the application of agricultural technology innovation plays an important role in increasing the productivity of the agricultural sector and creating opportunities for welfare improvement. One of the results is increased food security for farmers. Therefore, the use of technology by companies in modern agriculture is an important way to open up new opportunities to improve production efficiency, reduce risks, and increase comprehensive agricultural yields. These initiatives also help build close ties between companies and farmers, creating a mutually beneficial relationship for the overall advancement of agriculture.

One technological innovation that has received a lot of attention in this field is the use of mobile applications specifically designed to support farmers. PT Syngenta Indonesia itself has launched a farmer application called "peTani Apps." The main purpose of this application is to facilitate corporate communication between PT and its employees. Syngenta Indonesia, in collaboration with farmers, to form a positive transformation in the agricultural sector. The application contains information related to features that can be used to facilitate and provide real-time information on weather forecasts, the best farming techniques, the selection of appropriate crop varieties, and pest and disease control advice (Yogatama, 2021). With the presence of this communication platform through the app, companies can better understand the needs of farmers, as well as get more timely and relevant solutions to the challenges they face.

Farmers who want to get extensive information about the maize commodity and its details can download and install the peTani Apps. Based on data obtained from the official website of PetaniNK (2023), the number of peTani Apps users has reached 28,600+ users, 1,000+ kiosks, and 100+ traders. According to interviews conducted by researchers, part of the marketing team of PT Syngenta Indonesia RW said that:

"The purpose of PT Syngenta Indonesia launching peTani Apps is because we want to help farmers become corn experts through peTani Apps. Because there are many useful features that can facilitate farmers in finding information related to corn commodities, seeing the growth of corn plants in the field, and calculating fertilizer needs, there is a new launch called Dokter NK where NK Farmers can consult directly with corn experts regarding the problems they face." (Interview part of marketing team PT. Syngenta Indonesia RW, December 2, 2023)

As part of the digital transformation efforts in the agriculture sector, specialized mobile applications to support farmers, such as "peTani Apps" from PT Syngenta Indonesia, have become an innovative and sustainable option. This innovation creates a communication platform that allows companies and farmers to interact more effectively, forming a positive partnership.

Based on the results of the 2023 Agricultural Census of the Central Statistics Agency (BPS), the condition of agriculture in Indonesia has not changed much in the last ten years, and the use of technology is still minimal. The 2023 Agricultural Census results show the dominance of generation

X farmers (born 1965-1980) at 42.39%, followed by baby boomers (born 1946-1964) 27.61%, and millennial generation (born 1981-1996) 25.61% (Muhammad, 2023).

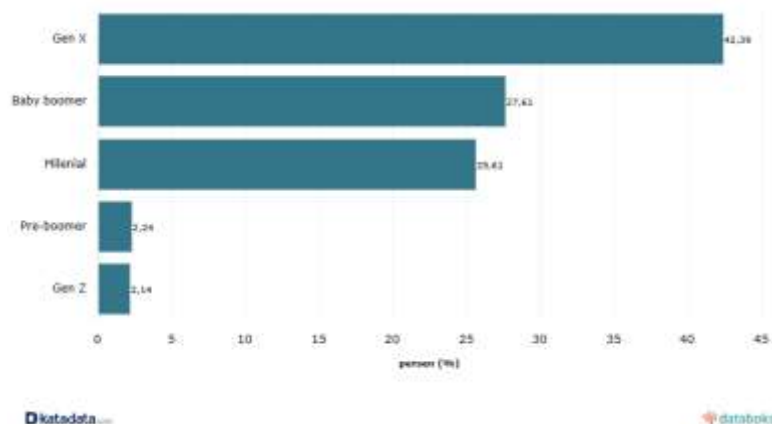


Figure 2. Distribution of Indonesian Farmers by Generation Group (2023)

Source: Databoks.metadata.co.id (2023)

According to data obtained from the Central Statistics Agency (BPS) in 2023, around 46.84% of farmers have adopted modern agricultural equipment and machinery (alsintan) and digital technology (Yunianto, 2023). The utilization of digital technology by farmers, which reached 46.84%, shows a positive trend in their readiness to adopt digital innovations. Although this figure has not reached all generations of farmers, it indicates that farmers, especially those over 39 years old, are increasingly open to the use of the Internet and digital applications. This creates a strong basis for understanding how the growth of digital technology has influenced farming practices (Rachman, 2023).

As pioneers of change in agricultural practices, the digital immigrant group, particularly maize farmers who actively participate in the digital ecosystem, is an important subject in understanding the impact of the rapid growth of digital technology. The digital immigrant generation refers to individuals who have been around since before and during the digital phase. (Mathar, 2016). Individuals in the digital immigrant generation category are those who were born before 1980, belonging to Generation X and baby boomers. They did not experience the development of the internet and computing together, so they need to put more effort into adapting to the language and practices of new digital technologies (Vina, 2022).

In this study, the term "digital immigrant group" refers not only to maize farmers who are new to or have recently adopted digital technologies but also includes those who have been involved in the agricultural digital ecosystem for a long time. Together, they form a group with unique characteristics, needs, and challenges in the context of agriculture. Their activities in using agricultural apps show that they are key players in integrating digital innovations in agricultural practices. This provides important insights into the impact of digital technologies on maize farmers' communication identities.

Meanwhile, in the context of peTani Apps, the role of farmers' communication identity is central to the successful adoption of this technology. Identity is generally defined as a group of meanings associated with the roles played by individuals in social structures (Burke & Stets, 2009). According to Butler, identity is considered as a performance of social recognition or otherwise where this action can be accepted by other individuals or groups (Setyorini, 2011). Meanwhile, (in Littlejohn

& Foss, 2017) indicates that identity is a crucial element that connects individuals to society, and communication serves as the link that facilitates this connection. Maize farmers' communication identities include aspects that shape the way farmers communicate, build relationships, and respond to change in a digital context. These involve elements of local culture, emphasized values, and farmers' digital experiences. Thus, the way farmers communicate, disseminate information, and shape their views on change has a significant impact on their interactions with these apps.

Communication identity is key to ensuring that a group, such as maize farmers in this context, can effectively accept, adopt, and integrate innovations through the utilization of digital technology, particularly peTani Apps technological innovations. Concepts such as personal identity, enactment identity, relational identity, and communal identity can be utilized to analyze the communication identity of maize farmers in the face of digital innovation. Thus, this research has relevance and potential to provide a broader perspective in the context of maize farmers' communication identity to design the methodology and analyze the findings. This research creates an unexplored space in the literature by exploring the relationship between maize farmers' communication identity and acceptance of digital innovations. The research focuses on exploring how the communication identity of maize farmers in the digital immigrant group plays an important role in the acceptance of innovations, particularly the utilization of digital technology in peTani Apps. So this research aims to analyze land use change and spatial planning in Bogor District and predict future land use trends. By understanding the dynamics of land use change, this research is expected to assist in formulating more effective and sustainable spatial utilization control strategies. The expected benefits of this research are to provide policy recommendations that can support better spatial management, and assist stakeholders in making the right decisions related to land and environmental management in Bogor Regency. In addition, the results of this research can also serve as a reference for future studies related to land use change and spatial planning in other regions.

METHOD

This study used qualitative research methods. This qualitative research relies on semi-structured interviews to collect data. This research utilizes interviews with corn farmers who are customers of PT Syngenta Indonesia and employees of PT Syngenta Indonesia. The population and sample in this study consist of three groups of informants. First, the key informant is the Digital Immigrant Corn Farmer group, which consists of 30 people from the Baby Boomers and Generation X generations who have worked as corn farmers for at least five years. Second, the supporting informant is RW, a private employee at PT Syngenta Indonesia, who is 28 years old and has worked as a Junior Sales Representative for five years. Third, the expert informant is Dr. Johar Arifin S.PT.MP., a lecturer and researcher at the Faculty of Animal Husbandry, Padjajaran University, who has extensive experience in agriculture and digital innovation. Data were analyzed using NVivo 12 Pro software to facilitate data coding effectively and efficiently. The analysis process involved data collection, reduction, presentation, and conclusion drawing/verification to accurately answer the research questions.

RESULTS AND DISCUSSION

Researchers discuss the findings using a reference to cluster analysis through the program provided by NVIVO to see the coding similarity between the findings of the coding reference in this

study. Cluster analysis that has been processed by researchers can be seen in chart 4.5. Each coding similarity of coding reference findings will be discussed through supporting literature in this study.

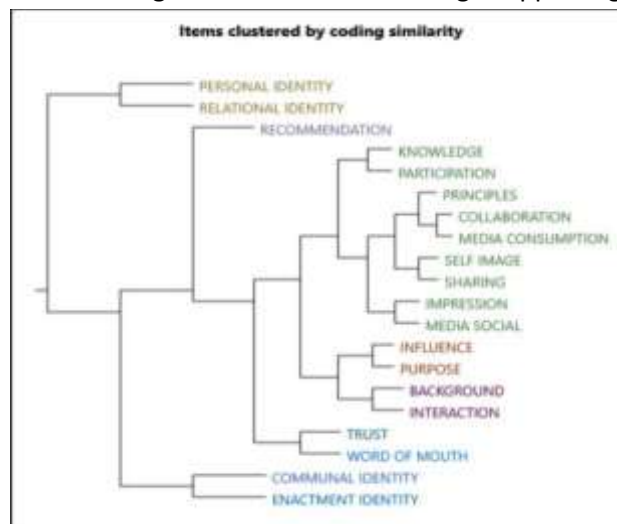


Figure 3. Research Cluster Analysis

Source: Processed by Researchers, 2024

The chart generated from the analysis using NVIVO above shows the relationship between important aspects that influence farmers' identity and social interaction in the context of peTani Apps digital technology adoption. In this study, several main clusters were identified, reflecting various dimensions of maize farmers' communication and identity. Based on the findings of the coding results through the cluster analysis data analysis method, it was found that personal identity and relational identity are two important elements that show how farmers see themselves as well as their relationships with others in the community or group of farmers. These two identities are linked to recommendation, which highlights the importance of recommendations from trusted individuals in the community. According to Rogers (2003) in his book *Diffusion of Innovations*, the adoption of new technologies is strongly influenced by the opinions of trusted individuals within the community. There is also a supporting statement delivered by key informant 1:

"And I also realize that not all farmers in my village have access or the ability to use such technology. Many of them may not be familiar or comfortable with the use of digital applications. As a farmer who is directly involved in agricultural activities in the field, I realize that direct communication and traditional information sharing are still very effective in our environment. In my opinion, it is still more effective in this village to share knowledge and experience directly, word of mouth". (Key Informant 1 DK, April 6, 2024)

"Yes, to influence it, not yet. Because in a village like this, it's not suitable, it depends on who's talking. So, it's still mouth-of-mouth that is more effective. If you look at the figure here, who is talking? For example, if I give a paper, who is this paper from? Well, because I have a history, I can be trusted by them; that's the term in the village. Even though I only give a paper, they believe me because I'm the one who said it." (Key Informant 1 DK, April 6, 2024)

Furthermore, there are key informants who say that the existence of groups can influence their views and behavior as maize farmers. This was conveyed by key informant 23:

"My membership in a farmer group has greatly influenced my views and behavior as a maize farmer. Through this group, I engage in various discussions, experience exchanges, and shared learning with fellow farmers. It broadens my horizons on better farming practices, inspires me

to adopt new innovations, and improves my skills in dealing with challenges in farming". (Key Informant 23 Mr. RD, May 2, 2024)

This statement was confirmed directly by expert informant Mr. Johar Arifin, who said:

"Farmers who are in communities that support the use of digital technology tend to be more open to trying the technology. Interaction with fellow farmers, agricultural extension workers, and agricultural experts who use digital technologies can provide positive examples and reduce fears or doubts about new technologies". (Expert Informant Mr. Johar Arifin, June 12, 2024)

In this case, recommendations are closely related to social systems. A social system is a collection of units that work together to solve problems and achieve common goals. This is supported by research conducted by Suryafma et al. (2023), which says that innovation diffusion theory explains how an innovation is adopted and communicated through certain channels within members of a social system within a certain period of time. This theory states that the speed of innovation is influenced by four elements, namely the characteristics of the innovation, the communication channels used to communicate the benefits of the innovation, the time the innovation is first introduced, and the social system in which the innovation is carried out or diffused.

Serah (2014) also explains that the factors that influence the innovation-decision process in the social system are:

1. **Social Structure:** The pattern of relationships between members of a social system that provides order and stability to behavior. Social structure can facilitate or hinder the diffusion of innovations.
2. **System Norms:** Patterns of behavior accepted by members of a social system as guidelines or standards. System norms may inhibit or support the acceptance of innovations depending on the degree to which the innovation conforms to existing values.
3. **Opinion Leaders:** Individuals who are able to influence the attitudes of others in the social system. Opinion leaders can be supporters or opponents of innovations, influencing the acceptance of innovations in the community.
4. **Change Agents:** Professionals tasked with influencing people in a social system to accept innovations. They receive specialized education or training for this role.

Knowledge and participation are important points given by key informants or maize farmers regarding the acceptance of the adoption of peTani Apps digital technology. According to Savitri et al. (2023), knowledge is important for farmers to increase their capacity. The knowledge they have and acquire can determine behavior and attitudes when making innovation adoption decisions. This is influenced by farmer characteristics, communication intensity, and innovation characteristics. Of course, knowledge is obtained through the participation of the community. In this case, the role of the local community or corn farmers in the application development process is very important. Analyzing the level of participation, understanding of community needs, and acceptance of new technology will provide insights into how the application can be successfully implemented. (Maglena et al., 2024).. Agricultural Information Sheet (2000) also states that farmer participation is very important because they are the ones who will directly feel the impact of the application of the technology. By participating, farmers will better understand and trust the technology they will be using, so their interest in the technology will grow over time. Furthermore, knowledge and participation are closely linked to principles that guide behavior and interactions within the

community. Principles such as honesty, hard work, helping each other, sharing, harmony, and openness in communication become the foundation for farmers to actively participate and develop their knowledge. Therefore, the growth of farmer groups (poktan) must consider common interests, natural resources, socio-economic conditions, familiarity, mutual trust, and harmonious relationships between members. This is important to maintain the sustainability of group life so that each member feels ownership and can enjoy the benefits of every activity carried out. (Anwarudin et al., 2021). In this study, all informants agreed that the values owned by farmer groups indirectly have a significant influence on the attitudes and identities of farmers who are members of them.

This means that the norms, beliefs, and practices maintained by farmer groups indirectly shape the way farmers identify themselves, including how they interact with new technological innovations such as peTani Apps. These experiences and indicators form the basis of strong collaboration between farmers, agricultural extension workers, and other relevant parties. Therefore, the social environment for farmer group dynamics is important. According to Lewin (Subekti et al., 2015), group dynamics are formed through interpersonal interactions between group members and the surrounding environment. This interaction produces mutually beneficial synergies. The success of strong synergy can be the foundation for farmer groups to achieve self-reliance. Media consumption, particularly through peTani Apps, plays an important role in facilitating farmers' access to the latest information and innovative solutions. Although the adoption of digital technology through peTani Apps is still in its early stages, the existence of good collaboration allows for further development to improve the acceptance and implementation of technological innovations among farmers. Thus, this study not only identifies the importance of collaboration and media consumption in technology adoption but also highlights the critical role of collective values and identity in shaping farmers' views and attitudes toward the technological innovations they receive. Therefore, innovation communication in agriculture is a process where farmers not only seek the latest information about agriculture but also actively explore and share knowledge with fellow farming actors in an innovative manner, with the aim of improving their agricultural productivity (Dharmawan et al., 2022).

Furthermore, self-image and sharing reflect how farmers see themselves or how farmers describe their role in the community. (Majid, 2019) and how they share their knowledge and experiences with fellow farmers (Prabwa, 2020). Farmers who have a positive self-image are more motivated to adopt new technologies and share their benefits with others. Information gained from the app and shared within the community helps strengthen social networks and increase technology adoption. This will form the continuity of the research, and the self-image in the enactment identity sub-analysis will form sharing, which is the process of sharing knowledge and experience brought by farmers into their community. In the cluster analysis results, impression, which discusses how individuals create an impression or image of themselves in interactions with others, is an important concern for farmers. In social interactions, each individual seeks to present his or her image or self-concept in front of others. (Kriyantono, 2017). This effort is known as impression management, where individuals intentionally use communication to form the desired impression of others towards themselves (in Siedharta et al., 2017). This contributes to shaping the positive self-perception farmers display to fellow farmers or other agricultural actors, as well as to technological innovations and strengthening social relationships among them through social media. Social media such as WhatsApp, Facebook, Instagram, and TikTok play a crucial role in facilitating communication and

interaction between farmers. Farmers can actively upload their daily activities, which helps explain the role of social media in shaping and maintaining communal relationships and individual identities within their social environment. This use of social media strengthens the adoption of better agricultural technologies and practices and encourages other farmers to follow their lead in implementing new technological innovations.

The use of social media in the era of globalization is very useful for building interactive communication networks in the agricultural sector. Social media enables free communication and creates awareness about the importance of community life. Information can be absorbed transparently, supporting the strength of networks, trust, and existing norms and values. Social media, which is often used by farmers, can be utilized as a source of agricultural information, including cultivation, marketing, processing, and the latest technology. Anyone can access all social media *platforms*, especially extension workers and farmers, to improve their farming capabilities. (Alif et al., 2023). Agricultural information management, by extension, workers should make optimal use of social media, although currently, its utilization is still lacking. In the future, social media will be central in the dissemination of agricultural information. Agricultural extension officers must equip themselves with the ability to manage social media and encourage farmers to utilize it as an alternative source of information. Digital technology not only functions as an instrument but also becomes part of actions and behaviors both individually and collectively. In relation to the previous *cluster analysis*, social media helps farmers create positive impressions and shape favorable perceptions of themselves and technological innovations. This strengthens social relationships and increases technology adoption among farmers. Optimizing the use of social media by extension workers and farmers is important to increase farm productivity and success.

On the other hand, farmers also have a significant role and contribute to *influencing* fellow farmers and other agricultural actors to achieve a common goal (*purpose*). This influence can come from agricultural extension workers, fellow farmers, or other sources of information that influence the way farmers receive technological innovations such as peTani Apps. In addition, this influence also includes how experiences and recommendations from other individuals motivate farmers to try and adopt new technologies. The process of disseminating new technology information can be done by extension methods that involve both extension workers and farmer group leaders. It is expected that through this approach, the knowledge transfer process can run effectively, changing farmers' knowledge, attitudes, and skills in maize cultivation. According to Mardikanto (in Putra et al., 2016), Extension plays an important role in bringing new technological information into agricultural practice. Farmers who are active in seeking information and able to adopt new technologies play a crucial role in the successful dissemination of this information. Agricultural Extension aims to help farmers solve their problems satisfactorily, thereby improving their livelihoods. Therefore, an important value embraced in Extension is empowerment so that farmers can achieve self-reliance (Sadono, 2008). This was often conveyed by supporting informant RW, who stated that when conducting agricultural counseling related to the socialization of peTani Apps in the field, he, who also served as an agricultural extension agent from PT Syngenta Indonesia, always conveyed the jargon that peTani Apps had, namely "becoming a corn expert easily." This aims to *influence* farmers to adopt peTani Apps' digital technology. Seen from some of the statements he delivered:

"So, in the field, we often say one word that is indeed a benchmark or important for us, which is that we are not here to patronize but to provide knowledge and technology that can

collaborate with the technology they have adopted before." (Supporting Informant RW, May 3, 2024)

"For the values themselves, this automatically must have an effect on interaction because we have jargon in peTani Apps, which is to become a corn expert easily. So, farmers are definitely interested in this peTani Apps application, especially if the features that are already in the application are also complete. So, they can adopt some, for example, traditional technology into more modern technology in just one touch of a hand in the peTani Apps application. That's what the peTani Apps marketing strategy is like. So, we give the farmers just one phone, one application, and they can immediately become corn experts". (Supporting Informant RW, May 3, 2024)

"So, the peTani Apps can help local farmers, but not all of them can adopt it. But maybe for farmers who have used it, they might be able to communicate directly in their respective areas". (Supporting Informant RW, May 3, 2024)

It is this statement that relates that *influence* and *purpose* generated by farmers, agricultural extension workers, and other agricultural actors can create motivation and aspirations that drive farmers to take action. In the context of this study, the purpose can refer to farmers' aspirations to increase agricultural productivity, obtain up-to-date information, or adopt more efficient agricultural practices. Meanwhile, agricultural extension and other agricultural activity actors also have the goal of helping farmers address their problems in a satisfactory way, which can ultimately improve their quality of life. This approach emphasizes empowering farmers in order to achieve self-reliance (Sadono, 2008). According to Juwanda & Zikri (2022), innovative and technology-based agricultural management using machinery, farm equipment, and digital technology in farming aims to increase productivity, add value, improve competitiveness, strengthen the competitive position, and provide sustainable economic benefits. Understanding these objectives is important to identify the drivers behind technology adoption and to develop strategies that support their acceptance.

In the cluster analysis, "influence" and "purpose" are situated in the context of "personal identity" and "enactment identity," suggesting that how individuals see themselves and how they interact within their communities impacts their influence and purpose in adopting new technologies. This understanding is essential in designing strategies to promote technology adoption among farmers. Then, expert informants shared some proposed strategies to increase the adoption and use of peTani Apps among maize farmers. First, continuous training and education are important to help farmers understand the benefits of the app and overcome technical hurdles. In addition, tailoring the app to local needs and leveraging existing social relationships within the farming community can encourage acceptance. Identifying and engaging opinion leaders in the community and ensuring accessibility of the technology is also key to successful adoption (Expert et al., June 12, 2024).

On the other hand, before interviewing the key informants, researchers often opened the interview by asking about the farmers' personal backgrounds first. Most farmers responded that they came from farming families. This information shows that farming skills and knowledge have been passed down through generations, forming a strong basis for their identity as farmers. This is supported by several key informant statements, namely:

"In my own opinion, I am a farmer who is somewhat familiar with the application, and also, I am a purely hereditary farmer, meaning that generations of families have all become farmers,

and then regarding corn farmers, maybe only about five years who really focus on being corn farmers." (Key Informant 2 SS, June 12, 2024)

"I followed my parents in farming from a young age. So, I know exactly what it means to be a farmer. I come from a farming family, so from a young age, I was used to farming and followed my parents to work in the fields. From them, I learned a lot about farming and managing the land well. Initially, our family grew rice and peanuts". (Key Informant 13 US, May 2, 2024)

"I am a descendant of farmers, even though my parents are civil servants, but I still farm in the village." (Key Informant 21 Mrs. FN, May 2, 2024)

"Yes, my father and mother are farmers, my younger brother also farms, we are farmers for generations." (Key Informant 29 Mrs. SR, May 2, 2024)

This strong attachment to family heritage also creates a sense of responsibility to pass on agricultural traditions and knowledge to the next generation. Farmer experience does not significantly influence the knowledge stage of innovations. This shows that the more experienced farmers are in farming, does not mean the better their knowledge of innovations. Experience as a farmer is obtained from generation to generation, so the knowledge that farmers have in cultivation is also very limited. Research conducted by Agatha and Wulandari (in Setiyowati et al., 2022) stated that farmers with longer farming experience tend to be more selective in accepting new innovations and not quick in making decisions. Farmers' education level does not have a significant influence on their knowledge. In this context, a higher level of education does not necessarily correlate with broader horizons or openness to innovation, as farmers tend to believe in ancestral teachings that have been passed down from generation to generation. Data obtained from the research location also shows that even though farmers are well-motivated, they still find it difficult to accept new information because they prefer to trust the traditional knowledge that they have had for generations.

The background or experience that maize farmers have can influence the way they interact with other farmer group members. Through these interactions, individuals gain feedback, validation, and new knowledge that can strengthen or change their identity. Social influence in innovation acceptance is also very visible, as farmers' backgrounds and life experiences influence how they accept and adapt to new innovations introduced through digital applications. Interaction with other farmers who have successfully adopted innovations can provide motivation and confidence for other farmers to follow in the same footsteps. This is reinforced by Serah (2014), who explains that there are four factors that influence the innovation-decision process in social systems, two of which are *opinion leaders* and *change agents*. *Opinion leaders* may come from farmers who have successfully used peTani Apps digital technology. This is reinforced by the statement of supporting informant RW, who stated:

"The best way is to cooperate with some farmers or millennial farmers who already use the peTani Apps; they can create a better relationship because they can disseminate information directly in the field." (Supporting Informant RW, May 3, 2024)

Meanwhile, *change agents* can come from agricultural extension workers who are professionally assigned by the company to influence people in the social system to accept innovations. They receive specialized education or training for this role. These change agents provide full attention, support, and direct assistance to farmers to maximize the use of peTani Apps.

Agricultural extension agents are a key element in supporting the transition to sustainable agriculture. Nurida et al. (2024) explained that agricultural extension officers have four key roles: facilitator, mediator, communicator, and consultant. As facilitators, they help millennial farmers access the technology and resources needed for sustainable agriculture. As mediators, they facilitate dialogue between farmers and relevant parties to reach a better understanding. As communicators, they deliver information and education to farmers on sustainable farming practices. Additionally, as consultants, they provide advice and technical guidance to farmers in implementing these practices.

In the context of this research, there is a mutually supportive relationship between *trust* and *word of mouth* (WOM). Trust forms the basis for farmers to accept both knowledge, experience, and innovations, while *word of mouth* serves as an effective tool for spreading information and strengthening trust. They need strong social ties, such as family or close friends, before they can trust information (Wicaksono et al., 2015). (Wicaksono et al., 2021).. This kinship relationship is important to provide emotional control and ensure marketing content is well delivered. This is in accordance with what Belch said (in Suminah et al., 2023) that WOM or *word of mouth* is able to provide trust and confidence to potential consumers in choosing a particular product or service because the recommendation comes from someone they trust. From the data obtained in the field, researchers found that farmers have good trust among fellow farmers. This can be described through several informant statements in interviews as follows:

"Yes, the point is that we work together, share experiences, provide advice, and provide input for the development of agricultural technology ."(Key Informant 1 DK, April 6, 2024)

"As a farmer who is directly involved in agricultural activities in the field, I realize that direct communication and traditional information sharing are still very effective in our environment. In my opinion, it is still more effective in this village to share knowledge and experience directly by word of mouth. But yes, I also try to take advantage of opportunities to provide input and share my commitment to modern sustainable agriculture, such as peTani Apps from Syngenta. I hope that with the collaboration between technology users and those who prefer traditional communication, we can achieve greater progress in the world of agriculture in our village". (Key Informant 1 DK, April 6, 2024)

"I tend to rely on direct communication and face-to-face talks with fellow farmers to discuss farming issues and share experiences." (Key Informant 3 NS, May 1, 2024)

"Yes, I think word of mouth is more effective. Because, in my group, the houses are close together. So it is easy to connect. Yes, so Gunung Sulah is more densely populated". (Key Informant 13 US, April 6, 2024)

Some informants say that they have more trust in who is speaking. When the person speaking is an individual they trust, this will lead to a positive reaction to spreading the information they convey by *word of mouth*.

"I believe more in direct communication or word of mouth from people who are more expert in corn here. I prioritize conventional beliefs that have been passed down from generation to generation. I prefer to rely on communication methods that have proven effective in carrying out agricultural activities, namely direct communication". (Key Informant 28 AS, May 2, 2024)

"Yes, establish communication, like to ask about agricultural solutions with those who are more expert or who study so their knowledge is broader; even though my mother is already old, she is still active in asking questions." (Key Informant 19 AD, May 2, 2024)

The statements of these informants were supported by supporting informants who mentioned that direct communication or *word of mouth* among maize farmers is still effective in a communal environment. They tend to prefer to gather somewhere to talk. In addition, information from people they trust will generate curiosity, and then the information can spread more widely. This can be seen from the statement he made:

"So, this is based on direct experience and communication. Indeed, I see that the elderly like to gather in a saung, house, or field where they can talk to each other. If I look at the farming area itself, if there is one good corn or they see a good agricultural culture, they will wonder, 'Why did you get such results? Where did the seeds come from? What dose of fertilizer was used? What is the planting distance? Then what kind of fertilizer application can be added? Well, all of this is in peTani Apps. So, this peTani Apps application can help local farmers, but not all of them can adopt it. But maybe for farmers who have used it, they might be able to communicate directly in their respective areas'". (Supporting Informant RW, May 3, 2024)

Expert informant Mr. Johar Arifin also highlighted the importance of social influence in the adoption of agricultural technology. According to him, respected leaders who adopt new innovations can influence group members to follow suit. However, negative experiences or distrust within the group can hinder the adoption of innovations. It is important for companies such as peTani Apps from PT Syngenta Indonesia to provide tangible evidence of the effectiveness of their technology through field demonstrations and direct support, so that farmers can see direct benefits in their daily farming activities. Furthermore, Mr. Johar Arifin provided another agricultural technology recommendation that can be used to provide tangible evidence of the benefits of their technology and provide hands-on support that can help farmers see concretely how the technology can facilitate their daily activities, namely the use of *drones* to monitor crop conditions and look for early signs of pests or diseases more efficiently and quickly to control the problem before it damages the crop extensively.

By understanding this relationship, new technology introduction programs such as peTani Apps can be more effectively designed to meet the needs and characteristics of maize farmers. Trust plays an important role in shaping farmers' personal and communal identities. Farmers who have confidence and trust in new technologies, such as the peTani Apps digital app, tend to share their positive experiences through *word of mouth*. This creates a positive cycle where testimonials from their peers reinforce farmers' confidence.

The final discussion of this research refers to the coding results through the *cluster* analysis data analysis method. It was found that *communal identity* and *enactment identity* are strongly related. Groups play an important role in shaping the way individuals perceive and express their identity and in motivating the adoption of new technologies that can improve their efficiency and productivity as farmers. According to Nurmawati (in Ardana et al., 2023), the values, beliefs, rules, and norms that surround a community group will influence the attitudes and actions of individuals in the community. In this context, a strong communal identity can encourage solidarity and support among farmers, which in turn can accelerate the acceptance of new technologies. Bouman et al. (2020) also supports this assertion by showing that interventions that emphasize environmental group values and identity can be highly effective in encouraging climate action, especially when focusing on groups that individuals strongly identify with, even if members of those groups have weaker group values. Frequent social identities, such as school classes or work groups, have a strong

and sustained influence on individuals' climate behavior and can internalize environmental values into their identities. Thus, interventions that emphasize group values and identity can play a significant role in shaping individual behavior, both in the environmental context and in adopting new technologies in the agricultural sector.

CONCLUSION

Based on the research results, it can be concluded that the peTani Apps digital technology innovation has not been effectively adopted by maize farmers in the digital immigrant group. The communication identity of farmers, which includes personal identity, enactment identity, relational identity, and communal identity, plays a crucial role in the adoption process of this technology. Many farmers feel insecure and inexperienced with advanced technology, leading to discomfort in using the app (personal identity). The peTani Apps has not yet become part of farmers' daily routine due to difficulties in navigation and understanding the app's functions (enactment identity). Support from the community and social relationships is vital; without successful examples and motivation from peers, farmers tend to be skeptical of new technologies (relational identity). Additionally, there is resistance to change in communities with strong traditional habits and norms (communal identity). While some farmers have successfully adopted peTani Apps, overall, it has not been widely adopted by digital immigrant groups. Social, cultural, and economic factors affect the adoption rate of this technology. Therefore, a more targeted strategy and greater support are needed to encourage equitable adoption among all group members. With a more holistic approach tailored to local conditions, it is hoped that peTani Apps digital technology innovations can be adopted more effectively, thereby increasing agricultural productivity and efficiency. This research suggests that future studies identify specific factors that hinder technology adoption among immigrant digital maize farmers using case studies and ethnographic approaches. It also recommends developing theories that consider the diversity of farming communities and employing a mixed methodology to explore the effectiveness of interventions in increasing technology adoption. Practically, peTani Apps implementation strategies should be tailored to farmers' specific needs, including intensive training and personalization of app content. Continuous training programs and technical support are also important to improve technology literacy. Building community support networks and collaborating with government, educational institutions, and the private sector are necessary to provide the infrastructure and resources that support widespread technology adoption.

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