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Overcoming Barriers to Digital Payment Adoption in Asset Agriculture (Livestock) Company: A Qualitative Exploration

Nurul Hasanah Uswati Dewi[A], Soni Harsono[B], Laqma Dica Fitrani[C], Herwin Ardianto[D]

Abstract

This study investigates the challenges faced by micro, small, and medium enterprises (MSMEs) in the Indonesian livestock industry in adopting digital payment systems. Despite government efforts to promote digitalization and financial inclusion, the adoption of digital payments remains limited in this sector. Through qualitative research employing in-depth interviews with 140 informants from 19 provinces, this study explores the barriers and obstacles encountered by livestock MSMEs in transitioning to digital payment transactions. The findings reveal that while informants acknowledge the benefits of digitalization, such as increased efficiency and market access, significant challenges persist, including inadequate internet access, limited digital literacy, and cybersecurity concerns. The results highlight the need for targeted initiatives to address these barriers, including improving infrastructure, providing digital literacy training, and strengthening cybersecurity measures. By identifying and addressing these challenges, policymakers can facilitate the successful adoption of digital payments in the livestock MSME sector, contributing to the achievement of relevant Sustainable Development Goals (SDGs) and promoting financial inclusion and sustainable agricultural practices.

Keywords: *Digitalization, Payment, Transactions, Livestock, MSMEs, SDGs.*

INTRODUCTION

The Indonesian Government is encouraging the development of digitalization in the development of MSMEs. Providing more comprehensive access to formal financial services is vital in improving community welfare, both access to placement of funds and business financing in traditional financial institutions. For this reason, the Indonesian Government is trying to integrate economic empowerment and financial inclusion activities to achieve a financial inclusion level of 90% by 2024. The Indonesian Government issued Presidential Regulation

[A]*Department of Accounting, Faculty of Economy and Business, Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia, Email: nurul@perbanas.ac.id*
[B]*Department of Management, Faculty of Economy and Business, Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia, Email: soni@perbanas.ac.id*
[C]*Department of Informastion System, Faculty of Engineering and Design, Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia, Email: laqma.fitrani@hayamwuruk.ac.id*
[D]*Department of Banking and Finance, Faculty of Economy and Business, Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia, Email: herwin.ardianto@perbanas.ac.id*

Number 114 of 2020 concerning the National Strategy for Financial Inclusion (SNKI), one of the priority target groups for inclusive finance, namely the agricultural sector, which targets farmers, livestock breeders, and fishermen. The farm sector is also one of the most significant pillars of the national economy, so the level of welfare of farmers, livestock breeders, and fishermen needs to continue to be encouraged. The Government is committed to developing financial literacy and entrepreneurial skills, especially for livestock farmers, as part of an inclusive and productive economic transformation effort by increasing knowledge transfer, technology, and partnership assistance. Efforts to scale up businesses by partnering with State-Owned Enterprises (BUMN) are expected to be able to accelerate smallholder livestock clusters. Apart from that, optimization of production results is also continuously encouraged through good supply and demand management, facilitating the distribution of subsidies, and encouraging regeneration by producing millennial breeders. The Government continues to strive to increase financing for farmer groups through credit distribution programs with relatively low interest rates. Regarding access to funding, the Government is also utilizing digitalization as a new option for society. Digitalization can encourage financial inclusion, which will impact overall economic activity, so digital financial acceleration is one of the development strategies for smallholder farmers.

This research was conducted in Indonesia's agricultural industry, livestock sector, and strategic food sector. Increasing and managing livestock products is a Sustainable Development Goals (SDGs) program. SDGs are global action plans that world leaders, including Indonesia, agree upon to end poverty, reduce inequality, and protect the environment. Optimizing the strategic food sector is hoped that it can support the SDGs. Indonesia responded to the SDGs through Presidential Regulation (Perpres) No. 59 of 2017 concerning the Implementation of the Sustainable Development Goals and Presidential Decree No. 111 of 2022 concerning the Implementation of the Sustainable Development Goals. The SDGs or Sustainable Development Goals are contained in Presidential Decree No. 111 of 2022, which includes four points, namely (a) Maintaining a sustainable increase in the economic welfare of society. (b) Maintaining the sustainability of community social life. (c) Maintaining environmental quality and inclusive development. (d) Implementation of governance that can support the improvement in the quality of life from one generation to the next Law Number 18 of 2019 concerning food states the importance of achieving food security by realizing food sovereignty, independence, and safety. The strategic food sector can come from plants or livestock. Food security indicators can be seen by the availability of sufficient food, both in quantity and quality that is safe, diverse, nutritious, equitable, and affordable. This can enable people to live healthy, active, and productive lives sustainably. Food products of animal or livestock origin are essential in food security because they are one of the strategic food sectors. Referring to the website of the Directorate General of Animal Husbandry

and Animal Health, Ministry of Agriculture of the Republic of Indonesia (https://ditjenpkh.pertanian.go.id), strategic food commodities of animal origin include beef/buffalo, as well as purebred chicken meat and eggs. It is considered strategic because it is one of the foods of animal origin most consumed by the public or widely cultivated by breeders.

Financial reporting reflects the business performance of a Company. For companies that have agricultural assets, the company's performance must pay attention to assessing agrarian assets (Kieso, 2020). The unique characteristics possessed by biological assets consist of a process of growth, production, degeneration, and procreation, which can result in qualitative and quantitative changes in animal and plant life so that they can produce new assets formed from agricultural products or, in other words. The availability of information, such as that obtained from digital platforms, can support the added value that occurs in the agricultural sector (Mirah et al., 2022). The availability of this information is presented in the form of financial reports that will be used by external and internal parties, which is essential in making decisions (Alfiani & Rahmawati, 2019). Financial reports are one of the efforts to increase value added by improving the quality of information on entities, including MSMEs (Dewi et al., 2018). These products can be harvested from biological assets owned by an entity (Dewi et al., 2018). There are differences in assets in companies whose primary business is biological assets (Dewi, 2018).

Stoldt et al., 2018 research discuss how decision-makers use technology to assess digitalization steps during the supply availability planning process. Research shows the true benefit of digitalization in the long term lies in creating transparency in processes, especially for SMEs/MSMEs, which until now required manual data acquisition and evaluation or adequate data acquisition. Therefore, a digitalization process is needed to provide facilities for the business ecosystem. Digitalization offers manufacturers ways and means to adapt production systems to handle market demands. The power of digital disruption comes from the ability of digital technology and infrastructure to shape how individuals, businesses, and other constituents of the economy and society interact. Digital technology is an interaction technology that can be utilized to improve, expand, and enrich interactions between economic constituents and society (Autio, 2017). The challenges faced in developing MSMEs in the 4.0 era are related to digitalization. This is because there needs to be an interaction between MSMEs and suppliers, customers and partners. (Autio, 2017).

Kraft et al., 2022 also revealed that introducing and adopting Industry 4.0 concepts and technologies can contribute significantly to transforming agriculture into something called Agriculture 4.0. Technological factors are also considered essential for development and are supported by education and the openness of farmers' mindset towards Industry 4.0. Gebresenbet et al., 2023, carrying out research related to agricultural innovation and productivity in the agricultural sector. This can contribute to improving the competitiveness,

sustainability, and resilience of the farming sector as a whole, as well as digital transformation in agriculture and rural areas. Eastwood et al., 2021 revealed that livestock technology innovation 4.0 requires collaboration between the government and the private sector in the livestock industry. This is mainly related to the development of system innovation, including policymakers, farmers, consumers, and technology developers. Birner et al., 2021 also researched agricultural digitalization and showed that private companies, including global software companies and start-ups in the agricultural sector, drive agricultural digitalization. Berawi, 2020 also researched the adoption of digitalization, which offers explicit opportunities for circular economic transformation in agriculture and food systems.

Small-scale farmers face significant challenges in adopting digital technologies. Effective government intervention is crucial to bridge this gap. This includes fostering collaboration among stakeholders and establishing a comprehensive regional development framework specifically designed to support digital solutions for small-scale farmers (Smidt & Jokonya, 2022). Traditionally, livestock farming has focused primarily on farmer characteristics. However, recent research suggests the need to consider additional factors, such as technology attributes, the interaction between technology and farmers, and institutional and psychological factors (Shang et al., 2021). Furthermore, the reliance of most agricultural SMEs on free digital tools highlights a critical issue: digital capital disparity acts as a barrier to broader adoption and exacerbates inequality. While government initiatives to promote digital adoption exist, their effectiveness appears limited (Saruchera & Mpunzi, 2023).

Research on the specific downstream sector of Indonesia's livestock industry remains limited. Despite this knowledge gap, the agricultural sector continues to be a vital pillar of the Indonesian economy, and the government is rightly concerned with the well-being of farmers and breeders. A robust livestock industry plays a crucial role in supporting the Sustainable Development Goals (SDGs) program. By ensuring access to food from the livestock sector, we can contribute to achieving key SDGs, including: (1) ending poverty in all its forms everywhere; and (2) achieving food security, eliminating hunger, improving nutrition, and promoting sustainable agriculture. This research investigates the challenges faced by the Indonesian government in digitalizing the livestock industry, particularly for Micro, Small, and Medium Enterprises (MSMEs). A key knowledge gap exists regarding the barriers hindering livestock MSMEs from adopting digital payment systems. This gap impedes the effectiveness of digitalization initiatives and the achievement of relevant Sustainable Development Goals (SDGs) within the sector. The primary objective of this study is to identify and analyze the key challenges faced by livestock MSMEs in adopting digital payment systems and how these challenges might impact the achievement of relevant SDGs. This research seeks to develop recommendations that empower various stakeholders, including livestock farmers, digital payment service

managers, and the government, to create effective strategies and regulations for promoting digital payment services specifically tailored to livestock MSMEs.

LITERATURE REVIEW

Digitalization

Innovation is responsible for half of a country's economic growth. Innovation capability is a success factor and has become a business necessity. The increasing digitalization of the economy has highlighted the importance of digital transformation and how it can help businesses remain competitive in the marketplace (Kraus et al., 2019). Innovation can be created by utilizing several information technology roles that have developed massively. The influence of technological globalization plays a significant role in offering benefits and supporting sustainability in the business world (Fitrani et al., 2022).

The rise of digital technologies, encompassing everything from computers and laptops to smartphones and smart applications, has woven them into the fabric of our daily lives. With nearly all aspects of human work now reliant on these digital tools, it's safe to say the invention of the computer has been one of the most transformative and impactful advancements in human history (Triandini et al., 2024). The digital economy is an economic activity whose main factor is data in digital form, which contributes to the formation of the information space, taking into account the needs of society to obtain quality and reliable information (Kuzmich, 2021). The priority area for the emergence of technological innovation is the food sector, both from agriculture and livestock, as evidenced by several supporting applications such as *sobaternak, ternaknesia, Segari, Edenfarm, tanihub* and others. Digitalization of the food sector will lead to the availability and openness of information for running business and improving food trade routes (Vărzaru, 2024).

Digitalization creates new business models based on increasing connectivity, overcoming distance problems, reducing communication barriers, strengthening business development factors, and changing the way of creating added value, leading to increased productivity and the economy (Neamțu et al., 2019). In addition, Digitalization or digital transformation is driving change in companies, including small businesses, by building new internet-based technology that has implications for society (Rachinger et al., 2019).

Digital technology provides alternatives and connects farmers or breeders directly so that distribution efficiency can be achieved so that farmers or breeders can obtain optimal profits and market their products more widely (Oktavia & Fathin, 2022). Having procedures and policies supporting and increasing digital transformation in the food sector can be the key to distribution efficiency and increasing food profitability in farmer and livestock groups. (Misiuk & Zakhodym, 2023)(Misiuk & Zakhodym, 2023) shows that the main of which are information systems for determining actual and potential resource needs, selection of potential suppliers and organization of purchase and sale operations (field of

resource provision); technologies for monitoring the state of farm animals, optimizing the diet and veterinary measures, forecasting the state of the animal, disease outbreaks, livestock productivity (production); online platforms for selling livestock products, electronic document management services, etc. (sales of products).

MSME Performance

Financial sustainability is the ability of a company to balance its internal strengths with external market forces. It's both a foundation for successful innovation and a result of those innovations driving improved profitability. This financial health isn't just a one-time snapshot; it's the ability to maintain stability over the long term. In a competitive environment, financial sustainability becomes crucial for planning future growth (Stoyancheva & Angelova, 2021).

According to research proposed by Rahmawati, 2019, company performance has two types of performance: financial and non-financial. Financial performance is influenced by factors such as economic conditions, changes in government policy, technological developments, and production costs. Financial support is the basis for accelerating the growth of a business. A company that can increase its competitiveness and competitive advantage usually has good financial performance, this can be proven by financial performance values in the form of ratios or indices. According to (Aulová et al., 2019) The performance of a business is an important gauge not only for the management of the business itself, but also for external entities that come into contact with the business, and this is precisely why it can be interpreted and comprehended in various ways.

Agricultural Livestock Industry

Agricultural Livestock Industry is an industry whose primary output is from animal or crop production. The general nature of biological or agricultural assets is that biological assets can be sold at any time at various levels of growth at specific market prices. For example, goats can be sold at any time or age at a fairly certain market price. Another characteristic is that the longer the life of the biological asset, the higher the price. For example, the older a teak tree has not been cut down, the higher the price. These two concepts are the basis for recognizing revenue along with growth. In the accretion concept, the value of biological assets continues to increase due to the entity's reasonable efforts. In addition, these biological assets are the result of main operating activities. Therefore, income is already formed in this situation, along with the growth of biological assets. However, this income has yet to be realized, so it is not appropriate to recognize it in the profit and loss statement. If using the accretion concept, the measurement of a biological asset can be based on fair value minus costs to sell (Dewi et al., 2018).

Sustainable Development Goals (SDGs)

SDGs are a global and national commitment to improve society, including 17 global goals and targets for 2030 declared by both developed and developing countries at the UN General Assembly in September

2015. These 17 goals are: (1) No Poverty; (2) No Hunger; (3) a Healthy and Prosperous Life; (4) Quality Education; (5) Gender Equality; (6) Clean Water and Adequate Sanitation; (7) Clean and Affordable Energy; (8) Decent Work and Economic Growth; (9) Industry, Innovation and Infrastructure; (10) Reducing Inequality; (11) Sustainable Cities and Settlements; (12) Responsible Consumption and Production; (13) Handling Climate Change; (14) Ocean Ecosystem; (15) Land Ecosystem; (16) Peace, Justice and Strong Institutions; (17) Partnership to Achieve Goals (https://sdgs.bappenas.go.id/)

Indonesia focuses on 7 of the 17 SDGs goals, namely ending poverty, no hunger, healthy and prosperous lives, gender equality, ocean ecosystems, and partnerships to achieve goals, as well as industry, innovation, and infrastructure. Optimizing the strategic food sector is hoped that it can support the SDGs program. The strategic food sector can come from agriculture or livestock. It is considered strategic because it is one of the foods of animal origin most consumed by the public or widely cultivated by breeders.

METHOD

This research utilizes data from two sources: the Central Statistics Agency's Indonesian livestock industry directory and Google listings for businesses categorized as "strategic food," including beef cattle, laying hens, and broiler chickens. We recruited a participants: 78 beef cattle farmers, 27 broiler chicken farmers, and 35 laying hen farmers, located across various provinces in Indonesia. These provinces include East Java, Central Java, West Java, North Sumatra, South Sumatra, West Sumatra, Yogyakarta, West Nusa Tenggara, East Nusa Tenggara, East Kalimantan, Lampung, Banten, Bali, Central Kalimantan, Bengkulu, Central Sulawesi, DKI Jakarta, South Sulawesi, and South Kalimantan. Informed verbal consent was obtained from all participants. We contacted potential participants directly by phone or in person and administered the questionnaire after securing their consent.

This research uses the help of NVIVO software for the data analysis process resulting from interviews with informants. NVIVO is software commonly used to analyze qualitative research data. The NVIVO version used for data analysis in this study is 12 plus. In contrast to SPSS or PLS, which uses data in the form of numbers, NVIVO uses data in documents, sound recordings, video recordings, images, and several other sources to support the results of its interviews.

The following section details the data analysis process: the first step of the data analysis technique is data reduction. Data reduction is a stage for summarizing, sorting out the main things, focusing on important things, and looking for themes and patterns. After that, the second step is data presentation. Data presentation is presenting data in brief descriptions, charts, relationships between categories, flowcharts, and the like. In qualitative research, data presentation uses narrative text. The third step is to draw conclusions and verify. Conclusions are temporary; if the conclusions are followed by valid and consistent

evidence when collecting data in the field, then the conclusions are credible.

RESULT AND DISCUSSION

The research stages were carried out by interviewing cattle breeders, laying hens and broiler chickens (strategic food sector), which began by sending emails and conducting telephone and direct interviews. To explore the phenomenon of digitalization, researchers conducted a Focus Group Discussion (FGD) with the Chair of the Association of Indonesian Poultry Breeding Entrepreneurs to understand the conditions and phenomena in the poultry industry.

Regional Variations

Based on the provincial distribution of informants, information was obtained that 140 informants were spread across almost all provinces in Indonesia. The most significant number of informants was in East Java province, with 61 informants (43.57%), followed by Central Java, with 32 informants (22.86%) and West Java with 10 informants (7.14%), several regions with D.I. Yogyakarta, DKI Jakarta, and Banten. Meanwhile, every archipelago outside Java is spread across Sumatra, Kalimantan, Bali and Nusa Tenggara. The distribution of informants can be seen in Table 1.

Table 1. Distribution of Informants' Areas of Origin

Provincial Distribution	Amount	Percentage (%)
North Sumatra	2	1.43%
South Sumatra	2	1.43%
West Sumatra	6	4.29%
Central Sulawesi	1	0.71%
South Sulawesi	2	1.43%
East Nusa Tenggara	1	0.71%
West Nusa Tenggara	3	2.14%
Lampung	2	1.43%
East Kalimantan	2	1.43%
Central Kalimantan	1	0.71%
South Kalimantan	3	2.14%
East Java	61	43.57%
Central Java	32	22.86%
West Java	10	7.14%
DKI Jakarta	1	0.71%
D.I Yogyakarta	6	4.29%
Bengkulu	2	1.43%
Banten	1	0.71%
Bali	2	1.43%
Amount	**140**	**100.00%**

Source: Data processed

Indonesia's provinces exhibit significant demographic variations in terms of culture, habits, and information technology infrastructure. To account for these differences, informants were selected from several regions with the highest livestock production volume and established businesses.

Perceived Benefits of Digitalization

The results of research on beef cattle and poultry show that informants feel that digital (non-cash) transactions speed up work, increase productivity, and increase efficiency, which are very beneficial for MSMEs. The cattle and poultry research results show that applying digital technology can improve efficiency, scalability, customer engagement, utility, customer satisfaction, customer retention, and the reputation of MSMEs.

In research on beef cattle and poultry, most informants felt that digital (non-cash) transactions made payment transactions more accessible, accelerated payment transactions, digital (non-cash) transactions provided a sense of security, and informants felt that digitalization made it easier to introduce MSMEs. Apart from that, informants felt that using digital (non-cash) applications was easy to learn, easy to use, very flexible and increased knowledge about digital transactions.

This research shows that digital technology makes it easy for customers to find sellers, making the market very open. Besides that, digital technology for MSMEs makes it easier for them to understand economic conditions, helps their relationships with suppliers, and improves relationships with their trading partners. This research shows that applying digital technology can improve efficiency, scalability, customer engagement, utility, customer satisfaction, and customer retention. Apart from that, internal policies also impact reputation, development, and interaction between MSMEs. It is interesting to note that MSME players feel that digital technology makes it easier for customers to find sellers, the market is very open, it is easy to understand economic conditions, helps supplier relationships with MSMEs and makes relationships with trading partners better, but the findings in this research were 83 informants stated that they had problems with internet access when using digital (non-cash) applications and 22 informants did not understand how to use digital (non-cash) applications. These obstacles have an impact on their perception of performance.

Barriers to Digital Payment Adoption

To gather in-depth data from informants, researchers employed a semi-structured interview protocol. This protocol included open-ended questions such as: (1) business type, (2) business duration, (3) use of digital transactions, (4) obstacles to digital transactions, and (5) frequently used transaction types. This approach allowed informants to elaborate on their experiences. Researchers then coded the collected responses for further analysis.

Additionally, researchers explored broader challenges related to digitalization and cash transactions. Informant responses revealed these key issues:

"I often find counterfeit money when making cash transactions"

"I have difficulty using internet banking"

“Internet access in hard-to-reach farm areas”

"I feel afraid of fraud in transactions using internet banking or transfers"

The following analysis is to conduct coding related to the answers to informants about the obstacles faced in digital transactions in table 2 and figure 1:

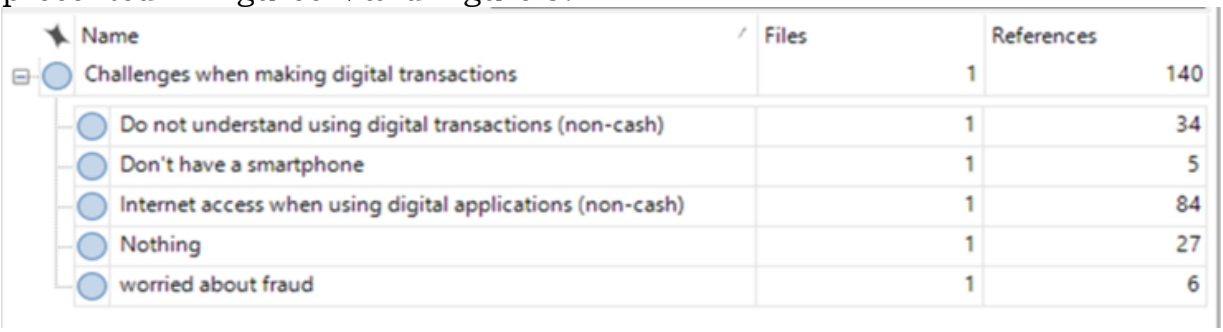
Table 2. Challenges of Digital Transactions

No	Challenges when making digital transaction	Total
1	Do not understand using digital transactions (non-cash)	34
2	Don't have a smartphone	5
3	Internet access when using digital applications (non-cash)	84
4	Nothing	27
5	Worried about fraud	6

Source: Data processed

Figure 1. Challenges of Digital Transactions Chart

Analysis conducted using NVIVO 12 Plus revealed the results presented in Figures 2 and Figure 3.



Name	Files	References
Challenges when making digital transactions	1	140
Do not understand using digital transactions (non-cash)	1	34
Don't have a smartphone	1	5
Internet access when using digital applications (non-cash)	1	84
Nothing	1	27
worried about fraud	1	6

Figure 2. NVIVO Analysis Output for Informant Answers

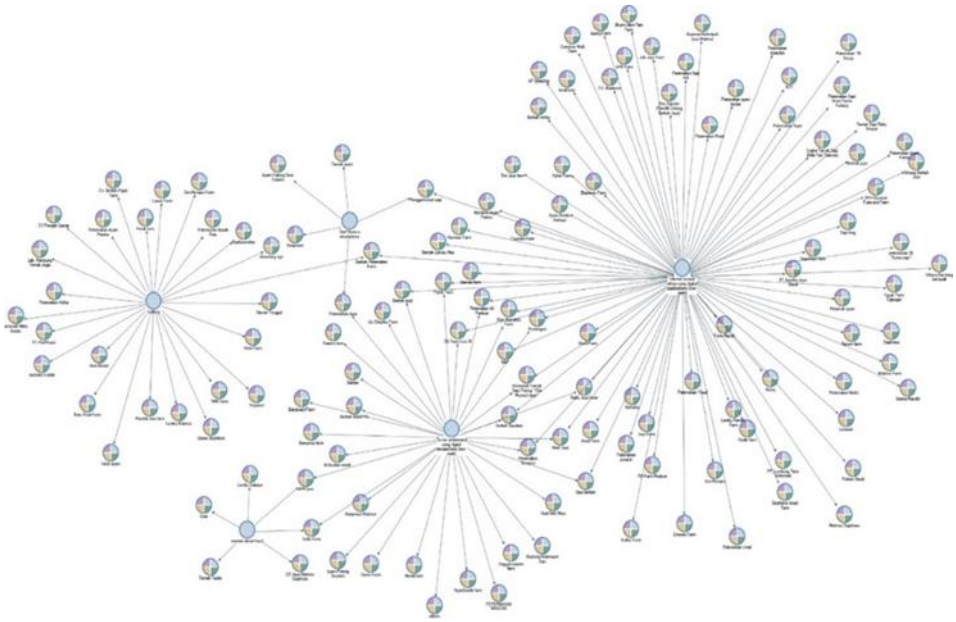


Figure 3. Project Maps NVIVO Analysis Output for Informant Answers

In interviews regarding barriers to the use of digitalization in livestock MSMEs, several options can be answered by informants, where this statement can be answered more than once. Answers that can be chosen include (1) no obstacles, (2) do not have a smartphone, (3) internet access when using digital (non-cash) applications, (4) do not understand using digital (non-cash) transactions, and (5) worry about fraud. The project map can be visualized in the form of a hierarchical diagram as in Figure 1, where 27 informants answered that there were no obstacles, five informants answered that they did not have a smartphone, 84 informants answered that they had internet access when using digital applications (non-cash), 34 informants answered that they did not understand using digital transactions (non-cash), and six informed informants were worried about fraud.

Informant profiles were categorized based on business scale, age, digital payment use, and barriers to such use. The research revealed a positive perception among breeders and entrepreneurs of broiler cattle, laying hens, and broiler chickens regarding livestock sales digitalization. They believe that increased digitalization leads to higher sales volume and easier payment management. This study's findings align with Shang et al. (2021) in highlighting the importance of considering additional factors beyond farmer characteristics when promoting digital adoption in livestock farming. These factors include technology attributes, the interaction between technology and farmers, and institutional and psychological factors.

This study suggests that while livestock farmers have some experience with digitalization, its growth is not optimal, particularly in MSME and cooperative farms. Most informants found digital (non-cash) transactions to be more accessible, faster, and secure. They also perceived digitalization as beneficial for MSME promotion. Additionally,

informants reported that digital applications were easy to learn, use, and offered increased knowledge about digital transactions.

Small-scale farmers face significant challenges in adopting digital technologies. Therefore, effective government intervention is crucial to bridge this gap. As suggested by Smidt & Jokonya (2022), this intervention could involve fostering collaboration among stakeholders and establishing a comprehensive regional development framework specifically designed to support digital solutions for livestock farmers. However, the research also highlights areas requiring government attention. Firstly, informants reported a significant lack of digitalization, with some even encountering counterfeit cash at slaughterhouses. Secondly, the biggest obstacle to digital transactions was identified as unreliable internet access. Limited understanding of digital transactions and fear of fraud were also mentioned as concerns.

In conclusion, the data analysis underscores the importance of digital tools for improved agricultural performance, as exemplified by downstream applications in the livestock industry (digitizing payment systems for sales, marketing, and distribution). While farmers have high expectations for the convenience of cashless transactions, practical challenges remain. These include unreliable internet access in rural areas and a lack of digital literacy among farmers. To address these barriers, this study recommends a two-pronged approach: strengthening digital infrastructure in rural areas and livestock centers, and promoting digital literacy regarding online payments among farmers. This approach can mitigate the risks of counterfeit money circulation and fraudulent transactions. Overall, this research offers valuable insights into the digitalization challenges faced by Indonesia's livestock industry. These findings can inform government decision-making, paving the way for a more robust and technologically integrated sector. The research solely examines obstacles within the livestock industry, limiting its ability to compare the challenges of digitizing payment transactions with those faced by other sectors.

CONCLUSION

Based on the results of research, direct interviews with breeders, and obstacles to the use of digitalization among breeders, which were conveyed through questionnaire answers (informants could provide answers to more than one obstacle), the livestock sector at the MSME and Cooperative scale still has obstacles in increasing sales with digitalization. So, the government's role is needed to increase digital literacy for breeders, namely through (1) The government needs to increase digital financial literacy for MSME and cooperative scale livestock business owner, especially in strategic food commodities (beef cattle and poultry) considering that cash transactions carried out by farmers often involve counterfeit money. (2) Ease of access to the internet network in livestock areas because signal problems are still felt to dominate farmers not to carry out digital transactions. Just like the government's policy towards natural tourist attractions, where at tourist

attractions, internet networks from providers and WiFi are in the open. (3) The government is expected to provide security guarantees for information systems to the public, especially in digital transactions.

This study highlights the significant challenges faced by livestock MSMEs in Indonesia in adopting digital payment systems, particularly related to internet access and digital literacy. To achieve the relevant SDGs, policymakers must address these barriers through targeted initiatives, such as improving infrastructure, providing digital literacy training, and ensuring robust cybersecurity measures.

This study contributes to the understanding of the challenges faced by livestock MSMEs in Indonesia in adopting digital payment systems. The findings reveal that while informants recognize the potential benefits of digitalization, significant barriers persist, including inadequate internet access, limited digital literacy, and cybersecurity concerns. These challenges hinder the effective implementation of digital payment systems and impede progress towards achieving relevant SDGs in the livestock sector. To overcome these obstacles, policymakers must prioritize targeted initiatives. Firstly, investments in improving internet infrastructure and connectivity in rural and agricultural areas are crucial to enable seamless digital transactions. Secondly, comprehensive digital literacy programs should be implemented to equip livestock MSMEs with the necessary skills and knowledge to navigate digital payment platforms effectively. Thirdly, robust cybersecurity measures and awareness campaigns are essential to address concerns about fraud and promote trust in digital payment systems. By addressing these challenges through a multi-faceted approach, the Indonesian government can facilitate the successful adoption of digital payments in the livestock MSME sector, contributing to financial inclusion, sustainable agricultural practices, and the achievement of relevant SDGs, such as no poverty, decent work and economic growth, and industry, innovation, and infrastructure. Future research could explore the effectiveness of specific interventions in overcoming the identified barriers, as well as investigate the potential socio- economic impacts of widespread digital payment adoption in the livestock industry.

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