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Farmers' Behavioral Intention to Adopt Digital Livestock Platforms: The Mediating Role of Attitudinal Readiness

Shamsiah Banu Mohamad Hanefar[1], Ismah Osman[2]*, Suleiman Shlash Mohammad[3,4], Mohamad Idham Md Razak[2], Abdul Rahim Ridzuan[2], Ilknur Ozturk[5], Ririn Tri Ratnasari[6], Asokan Vasudevan[7]

[1]Faculty of Education and Liberal Arts, INTI International University, Negeri Sembilan, Malaysia, [2]Faculty of Business and Management, Universiti Teknologi MARA, UiTM Selangor, Selangor, Malaysia, [3]Department of Business Administration, Business School, Al-AlBayt University, Mafraq 25113, Jordan, [4]Research Follower, INTI International University, 71800 Negeri Sembilan, Malaysia, [5]Faculty of Economics, Administrative and Social Sciences, Nisantasi University, Istanbul [6]Centre for Halal Business Digitalization, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia, [7]Facu,lty of Business and Communications, INTI International University, Negeri Sembilan, Malaysia. *Email: ismah817@uitm.edu.my

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ABSTRACT

The rapid digital transformation of agriculture has intensified the need to understand the factors influencing farmers' adoption of digital livestock platforms, particularly in developing economies such as Malaysia. Although prior studies have largely relied on technology acceptance frameworks, limited attention has been given to how institutional pressures shape farmers' adoption intentions. This study addresses this gap by examining the effects of coercive, normative, and mimetic pressures on behavioral intention, with attitudinal readiness serving as a mediating mechanism. Drawing on Institutional Theory, coercive pressure is represented by facilitating conditions, normative pressure by social influence and halal compliance, and mimetic pressure by perceived innovativeness, performance expectancy, and effort expectancy. Data were collected from 254 livestock farmers in Malaysia using a self-administered questionnaire and analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that halal compliance, perceived innovativeness, and effort expectancy significantly enhance attitudinal readiness, whereas facilitating conditions, social influence, and performance expectancy do not show significant effects. Furthermore, attitudinal readiness significantly influences behavioral intention and mediates several relationships. The results indicate that mimetic pressures, particularly ease of use and innovativeness, exert stronger influence than coercive pressures, while normative pressures are effective mainly when aligned with religious values such as halal compliance. These findings suggest that successful adoption of digital livestock platforms depends not only on structural support but also on cognitive readiness and value congruence among farmers.

Keywords: Digital Livestock Platforms, Farmers, Behavioral Intention, Attitudinal Readiness, Halal Compliance, Institutional Theory, Sustainable Agriculture, Food Security
JEL Classifications: Q16, Q12, O33, M15

1. INTRODUCTION

The swift digital revolution of the agriculture industry has generated unparalleled prospects to improve productivity, transparency, and sustainability in global food systems (Bhardwaj et al., 2025; Pletsch et al., 2025). Emerging digital technologies, such as mobile platforms, the Internet of Things, blockchain, and data-driven farm management systems, are being increasingly advocated to enhance agricultural efficiency and fortify supply chain integration (Alshehri, 2023; Rejeb et al., 2021; Yang et al., 2025). In the livestock sector, these technologies present considerable promise to enhance animal monitoring, resource

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management, market connectivity, and traceability across the production and distribution processes (Baker et al., 2022; Zaabar et al., 2025). With the growing complexity and globalization of food systems, digital platforms have become essential tools that enable farmers to access real-time information, enhance decision-making, and engage more effectively in contemporary agricultural markets (En and Hui, 2023).

The Malaysian government acknowledges the significance of agricultural digitalization and is prioritizing the integration of digital technologies in agriculture via initiatives like the National Agrofood Policy 2.0 (NAP 2.0) and the Malaysia Digital Economy Blueprint (World Bank, 2024; Hassim et al., 2024). These endeavors underscore the significance of digital platforms, precision agriculture technology, and data-centric agricultural management systems in augmenting productivity, fortifying food security, and advancing rural economic development (Ramli et al., 2025; Rosnan and Yusof, 2023; En and Hui, 2023). Digital platforms can enhance herd management, provide real-time market data, and increase coordination within the supply chain for livestock farmers (Ariffin et al., 2021; Hashom et al., 2023; Mohammad et al., 2025).

Notwithstanding these prospective advantages, the effective execution of digital agriculture initiatives is contingent upon farmers' readiness to embrace and employ these technologies in their routine practices, a process frequently obstructed by the "digital divide" and infrastructural deficiencies in rural regions (Omar et al., 2024; Ab Rahman et al., 2024). Digital platforms enhance halal livestock production by improving operational efficiency, ensuring compliance with halal standards, and strengthening consumer trust. The integration of digital technologies in halal logistics also improves supply chain performance, particularly in terms of product quality and traceability (Nurhayati, 2023). Significantly, these platforms enhance supply chain efficiency and empower customers by offering transparent information about the halal status of products, which is crucial for establishing confidence and credibility in the halal market (Davids and Sabrain, 2022).

Researchers have extensively utilized theoretical models, including the Unified Theory of Acceptance and Use of Technology, to comprehend technology adoption behavior. This model posits that performance expectancy, effort expectancy, social influence, and facilitating conditions substantially affect users' behavioral intention to embrace new technologies (Ravindran et al., 2024; Mohammad, 2025). These frameworks have been extensively employed to elucidate technology adoption in diverse fields, such as digital agriculture and smart agricultural systems in Malaysia (World Bank, 2024; En and Hui, 2023). Previous research indicates that farmers are more inclined to accept agricultural technology when they regard them as beneficial, user-friendly, and bolstered by sufficient infrastructure and social networks (Chen et al., 2024; Omar et al., 2024).

In the livestock sector, the shift from traditional practices to digital livestock platforms is significantly affected by the perceived simplicity of monitoring animal health and the accessibility of technical support (Zaabar et al., 2025). Nonetheless, the adoption of technology in agricultural communities is influenced not only by the attributes of the technology itself but also by wider contextual, cultural, and value-oriented factors, including halal integrity and religious ethics, which exert significant normative pressures in the Malaysian context (Aji et al., 2024; Hakim and Supriyanto, 2024; Sutikno and Aji, 2024). More importantly, institutional forces; coercive, normative, and mimetic remain underexplored in digital agriculture, particularly in livestock (Burdon and Sorour, 2020). This gap persists despite evidence that adoption is shaped by social norms and regulatory frameworks (Hassim et al., 2024; Rosnan and Yusof, 2023; World Bank, 2024; En and Hui, 2023).

Hence, this study employs institutional theory, a vital paradigm for comprehending how digital platforms get legitimacy and social integration in the contemporary economy (Alam and Miah, 2024; Burdon and Sorour, 2020). The longevity of a platform in the digital ecosystem relies not just on its technical functionality but also on its conformity to prevailing societal norms and cognitive frameworks (Burdon and Sorour, 2020). This theory posits that platforms must contend with three principal institutional pressures: coercive pressures from regulatory authorities, mimetic pressures as companies emulate successful digital innovators, and normative pressures stemming from the collective expectations of users such as Generation Z (Lee et al., 2024). An important contribution of Institutional Theory is explaining how certain digital practices become widely accepted and routinely followed without question (Cook et al., 2023). For instance, digital livestock platforms have gradually reconfigured conventional farming practices from informal, experience-based decision-making into standardized, technology-enabled management systems (Yang et al., 2025). This transformation facilitates a cognitive shift whereby digital technologies are no longer viewed as external or disruptive innovations, but rather as legitimate and taken-for-granted components of modern agricultural practice, thereby accelerating their institutionalization among farmers (En and Hui, 2023; Fox et al., 2021).

Further, although prior studies highlight the importance of attitudes in shaping behavioral intention, the role of attitudinal readiness in digital agriculture adoption remains insufficiently explored (Chindasombatcharoen et al., 2024). Most research treats attitude as a direct predictor, overlooking its mediating role in translating technical and contextual perceptions into actual behavioral outcomes (Ahmed et al., 2024; Sandhu et al., 2024). In livestock farming, where farmers face uncertainty, limited digital literacy, and perceived risks, adoption is unlikely to depend solely on perceived usefulness or ease of use (Rosnan and Yusof, 2023). Instead, farmers must first develop readiness, including confidence, acceptance, and compatibility with existing practices (Ravindran et al., 2024). However, empirical evidence on this mediating mechanism remains limited, particularly in rural and developing contexts (Li et al., 2024). Moreover, existing models inadequately capture the sequential process from perception to attitude to intention (Fox et al., 2021).

Consequently, this study aims to examine the key drivers influencing farmers' behavioral intention to adopt digital livestock platforms. Specifically, it investigates the role of institutional

pressures including coercive, normative, and mimetic forces, in shaping adoption decisions, alongside the mediating effect of attitudinal readiness. From this perspective, the study incorporates technological, socio-cultural, and value-based considerations, particularly within the context of halal compliance and agricultural practices in Malaysia. The study contributes to the literature by integrating ethical, institutional, and behavioural perspectives to provide a more comprehensive understanding of digital platform adoption among livestock farmers, grounded in Institutional Theory (Burdon and Sorour, 2020). The paper concludes with a detailed discussion of the findings, followed by practical implications, policy recommendations, study limitations, and directions for future research.

2. LITERATURE REVIEW

2.1. Institutional Theory

This study, prompted by Institutional Theory, conceptualizes the adoption of digital livestock platforms as a process influenced by three types of institutional pressures; coercive, normative, and mimetic that affect farmers' behavioral intentions through the formation of attitudes (Lee et al., 2024). This perspective, in contrast to simply technological models, acknowledges that adoption behavior is situated within a wider socio-institutional context, where legitimacy, conformity, and collective views are crucial (Burdon and Sorour, 2020).

Coercive pressures denote the official and informal influences imposed by regulatory authorities, governmental laws, and institutional frameworks that dictate individual conduct (Alam and Miah, 2024). In this study, coercive pressure is defined by facilitating conditions, which include the provision of infrastructure, technical assistance, training, and institutional resources that facilitate the utilization of digital platforms (Omar et al., 2024). These conditions represent the "rules of the game" established by institutional entities, including the Malaysia Digital Economy Blueprint and government-driven agricultural initiatives, which structurally incentivize or indirectly coerce farmers to adopt digital technologies to maintain their integration within contemporary agricultural systems (Hassim et al., 2024; Rosnan and Yusof, 2023).

Secondly, normative pressures emerge from collective ideals, cultural expectations, and ethical norms that delineate socially acceptable behavior (Burdon and Sorour, 2020). In the livestock industry, these pressures are reflected in halal compliance and societal impact (Aji et al., 2024; Rejeb et al., 2021). Halal compliance signifies the significance of religious and ethical legitimacy, especially in Muslim-majority regions such as Malaysia, where adherence to Shariah rules and halal traceability is a crucial factor for acceptance and market access (Kurniawan et al., 2025). Simultaneously, social influence encompasses the expectations and viewpoints of peers, extension officers, and community leaders, which collectively mold farmers' perceptions of what is deemed appropriate or acceptable behavior in the adoption of digital platforms (Chen et al., 2024; Rosnan and Yusof, 2023).

Thirdly, mimetic pressures arise in uncertain settings, prompting individuals to emulate the behaviors of those regarded as successful or legitimate (Burdon and Sorour, 2020; Lee et al., 2024). This study characterizes mimetic pressures through effort expectancy, performance expectancy, and perceived innovativeness, which together indicate cognitive assessments that influence imitation behavior (En and Hui, 2023). Effort expectancy reflects the degree to which a platform is regarded as simple to learn and use, alleviating technological fear and uncertainty related to adoption (Sandhu et al., 2024). Performance expectancy denotes beliefs of prospective advantages, like enhanced herd monitoring and productivity improvements, functioning as a criterion for assessing efficacy (Ariffin et al., 2021; Ab Rahman et al., 2024; Zaabar et al., 2025). Perceived innovativeness denotes the degree to which the platform is regarded as contemporary and progressive, motivating farmers to conform to evolving technical trends to sustain competitive legitimacy (En and Hui, 2023).

2.2. Hypothesis Development

2.2.1. Coercive pressures

Facilitating conditions denote the degree to which individuals believe sufficient technical, organizational, and infrastructural support is available to facilitate the utilization of a specific technology (Ravindran et al., 2024). In technology adoption studies, facilitating conditions often encompass access to digital infrastructure, technical assistance, training programs, and institutional support that empower users to effectively engage with new systems (Omar et al., 2024). In the realm of digital livestock platforms, enabling conditions encompass the presence of dependable internet connectivity, mobile devices, technical assistance from agricultural agencies, and backing from platform providers or governmental initiatives that advocate for digital agriculture (Hassim et al., 2024; Rosnan and Yusof, 2023). When enabling structures exist, farmers are more inclined to feel assured in their capacity to utilize digital technologies, thus enhancing their psychological or attitudinal readiness to adopt these platforms (Chen et al., 2024).

Within the framework of institutional theory, facilitating conditions may be regarded as a manifestation of coercive pressure (Alam and Miah, 2024; Lee et al., 2024). Coercive pressures stem from formal regulations, policies, institutional frameworks, and regulatory contexts that influence organizational or individual conduct (Burdon and Sorour, 2020). Governments, regulatory agencies, and institutional entities frequently formulate policies and programs that promote or indirectly necessitate the adoption of specific technologies or practices (World Bank, 2024). In the agricultural sector, initiatives fostering digital transformation such as national digital agriculture strategies (e.g., the Malaysia Digital Economy Blueprint), government subsidies for smart farming technologies, and training programs facilitated by agricultural extension services establish structural conditions that affect farmers' adoption behavior (Hassim et al., 2024; Ab Rahman et al., 2024). These institutional supports clearly indicate that digital technologies are the anticipated or legitimate trajectory for contemporary agricultural operations.

Coercive institutional pressures do not directly compel farmers to adopt digital livestock platforms; instead, they influence the

context of adoption decisions by offering resources, infrastructure, and institutional incentives that promote technological engagement (Alam and Miah, 2024; Lee et al., 2024). Farmers are more inclined to cultivate favorable attitudes for digital platforms when they recognize robust supporting conditions backed by institutional frameworks (Omar et al., 2024; Ravindran et al., 2024). Thus, facilitating conditions enhance attitudinal readiness by diminishing perceived obstacles to technology utilization and reinforcing the institutional expectation that digital solutions are essential for the modernization and sustainability of the livestock sector. Consequently,

H_1: Facilitating conditions influence farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

2.2.2. Normative pressures

Halal compliance constitutes a vital normative aspect of commercial and agricultural practices in Muslim-majority nations (Sutikno and Aji, 2024). In livestock production, halal compliance denotes the conformity to Islamic standards regarding animal welfare, slaughtering methods, and the management of meat products across the supply chain (Ariffin et al., 2021; Rejeb et al., 2021). These principles serve as regulatory standards and include ingrained religious and cultural values that influence the conduct of producers, consumers, and supply chain participants (Aji et al., 2024). As a result, technologies that facilitate halal assurance, including digital livestock platforms that provide traceability and monitoring, are increasingly regarded as tools that enhance the credibility and legitimacy of halal practices in the agricultural sector (Alshehri, 2023; Yang et al., 2025).

Halal compliance, viewed through the lens of institutional theory, can be perceived as a type of normative pressure that shapes individuals' attitudes and behaviors (Lee et al., 2024). Normative pressures stem from collective ideals, ethical duties, and professional or societal standards that delineate acceptable behavior within a community (Burdon and Sorour, 2020). In Muslim communities, compliance with halal principles is commonly viewed as a moral and religious duty, and those engaged in halal-related sectors are anticipated to maintain these standards in their operating activities (Aji et al., 2024). Consequently, farmers within the halal livestock ecosystem are expected to encounter normative pressure to implement techniques and technologies that uphold halal integrity and adhere to Islamic principles (Alshehri, 2023).

This normative effect can mold farmers' attitudinal readiness, denoting their psychological readiness and inclination to adopt new technology (Rosnan and Yusof, 2023). Farmers may cultivate more favorable views toward digital livestock platforms when they are viewed as instruments that augment halal transparency, promote traceability, and support adherence to religious mandates (Ariffin et al., 2021). The congruence of technical innovation with religious beliefs diminishes ethical ambiguity and enhances the perceived legitimacy of digital systems (Aji et al., 2024; Sutikno and Aji, 2024). Consequently, halal compliance can enhance attitudinal readiness by strengthening the belief that utilizing digital livestock platforms is both operationally advantageous and socially and religiously suitable within the halal agricultural framework. Therefore,

H_2: Halal compliance influence farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

Social influence significantly shapes individuals' views and willingness to adopt new technology, especially in communal settings like agricultural communities (Omar et al., 2024). In rural agricultural settings, decision-making is frequently shaped by engagements with peers, community leaders, extension officers, and various stakeholders within the agricultural ecosystem (Chen et al., 2024). Social interactions establish expectations for suitable behaviors, which might affect farmers' perceptions and assessments of technological advancements (Rosnan and Yusof, 2023). Consequently, social influence facilitates the formation of attitudinal readiness, and inclination of individuals to adopt new systems or behaviors.

Institutional theory posits that social influence embodies normative demands stemming from collective values, professional standards, and societal expectations within a certain community (Lee et al., 2024). Normative pressures influence behavior by defining what is seen valid or desirable within a social group (Burdon and Sorour, 2020). In the agricultural sector, farmers frequently depend on the insights and advice of fellow farmers, cooperatives, and agricultural extension agencies when assessing new technology (Chen et al., 2024; Hassim et al., 2024). When prominent figures in the agricultural sector such as digital innovators or governmental bodies—endorse digital livestock platforms, these endorsements prompt other farmers to regard these technologies as credible and authoritative standards for conduct (Burdon and Sorour, 2020; Ab Rahman et al., 2024).

Thus, social impact enhances farmers' attitudinal readiness by affirming the belief that the use of such technology is advantageous and socially endorsed (Omar et al., 2024). Witnessing successful implementation by peers diminishes the perceived ambiguity and risk linked to digital technologies, thereby converting these innovations into "taken-for-granted" practices inside the community's social reality (Cook et al., 2023). Normative pressures within the institutional environment significantly influence farmers' attitudes and readiness for digital innovation, thereby promoting the dissemination of digital livestock platforms in agricultural communities (Lee et al., 2024; En and Hui, 2023). As a result,

H_3: Social influence has an effect on farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

2.2.3. Mimetic pressures

Within an institutional environment, effort expectancy, performance expectancy, and perceived innovativeness represent distinct cognitive drivers that influence adoption through different mechanisms of legitimacy and imitation. Effort expectancy reflects perceived ease of use, reducing uncertainty and facilitating adoption through mimetic processes grounded in feasibility (Venkatesh et al.,

2003; Davis, 1989). In contrast, performance expectancy captures perceived functional benefits and operates through outcome-based imitation, where individuals adopt technologies based on observable success and efficiency gains (Venkatesh et al., 2003). Meanwhile, perceived innovativeness reflects the extent to which a technology is viewed as novel and advanced, influencing adoption through legitimacy-seeking behavior and alignment with emerging industry norms (Rogers, 2003; Agarwal and Prasad, 1998). From an institutional perspective, these mechanisms correspond to mimetic pressures, whereby individuals emulate practices perceived as feasible, beneficial, or symbolically legitimate within their environment (DiMaggio and Powell, 1983; Scott, 2014; Burdon and Sorour, 2020).

Effort expectation denotes the level of simplicity involved in utilizing a specific technology (Ravindran et al., 2024). Within digital livestock platforms, effort expectancy denotes farmers' opinions of the ease associated with learning, operating, and integrating digital technologies into their current agricultural practices (Omar et al., 2024). Technologies seen as straightforward and user-friendly are more likely to be embraced by farmers with minimal experience in digital systems (Chen et al., 2024; Rosnan and Yusof, 2023). Farmers are more inclined to cultivate favorable views about a digital platform when they perceive that it necessitates minimal work or technical proficiency (Ab Rahman et al., 2024).

In the viewpoint of institutional theory, effort expectancy is associated with mimetic pressures, especially when farmers depend on the experiences of others to assess the intricacy of new technology (Alam and Miah, 2024). In agricultural societies, farmers frequently acquire knowledge informally through observation and peer interaction (Omar et al., 2024; Rosnan and Yusof, 2023). When early adopters exhibit the user-friendliness and practicality of digital livestock platforms within regular agricultural practices, other farmers may emulate their actions and exhibit increased receptiveness to adopting similar technologies (Burdon and Sorour, 2020). This imitation process exemplifies mimetic isomorphism, when individuals emulate actions deemed viable and productive within their context (Lee et al., 2024).

As farmers witness their peers effectively utilizing digital platforms with relative ease, their apprehension over the technology's intricacy lessens (Omar et al., 2024; Ravindran et al., 2024). This observational learning process can improve farmers' psychological readiness to experiment with digital technologies and incorporate them into their livestock management practices (World Bank, 2024). Thus, effort expectancy can enhance attitudinal readiness by strengthening the belief that digital technologies are manageable and accessible (Ab Rahman et al., 2024; Rosnan and Yusof, 2023). Due to mimetic pressures, farmers are increasingly predisposed to adopt technologies that seem user-friendly and are well accepted within their agricultural networks (En and Hui, 2023). Thus,

H_4: Effort expectancy influence farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

Performance expectancy denotes the extent to which individuals perceive that utilizing a specific technology will improve their performance or productivity. In the realm of livestock farming, performance expectancy denotes farmers' beliefs that digital livestock platforms can enhance operational efficiency, improve herd management, and grant access to essential market information (Omar et al., 2024; Zaabar et al., 2025). Farmers are more inclined to accept a technology when they perceive it as capable of yielding concrete advantages, such as enhanced productivity or superior decision-making (Chen et al., 2024). In institutional theory, the impact of performance expectancy can be elucidated through mimetic pressures, especially when individuals encounter uncertainty over the results of adopting new technology (Lee et al., 2024). Agriculturists frequently assess innovations by examining the experiences of peers who have already implemented them (Omar et al., 2024; Rosnan and Yusof, 2023). When digital platforms enhance the success of early adopters such as by augmenting efficiency or market reach, other farmers may replicate these techniques to get analogous advantages (Ariffin et al., 2021; Hashom et al., 2023). This imitative behavior exemplifies mimetic isomorphism, wherein actors emulate actions regarded as successful within their context (Lee et al., 2024).

Performance-related observations can influence farmers' readiness to adopt digital livestock platforms (Ravindran et al., 2024; Rosnan and Yusof, 2023). When farmers observe their counterparts attaining enhanced productivity or operational benefits using digital technology, they may become more psychologically inclined to adopt these systems themselves (Omar et al., 2024). The observed success of others offers confirmation that the technology is advantageous and dependable, thereby diminishing ambiguity and fostering a more favorable disposition toward digital innovation (Chen et al., 2024). Thus, performance expectancy might enhance attitudinal readiness by encouraging farmers to use technologies that exhibit tangible advantages in their agricultural communities (Ab Rahman et al., 2024; En and Hui, 2023). As a result,

H_5: Performance expectancy influence farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

Perceived innovativeness denotes the extent to which individuals regard a technology as novel, sophisticated, and capable of revolutionizing current practices (En and Hui, 2023). In digital agriculture, perceived innovativeness denotes farmers' beliefs that digital livestock platforms are contemporary and advanced instruments that can enhance farm management and market integration (Omar et al., 2024; Zaabar et al., 2025). Innovative technologies frequently garner attention and interest from farmers aiming to enhance production and competitiveness (Chen et al., 2024). The notion of technical novelty can affect farmers' motivation to investigate and engage with digital solutions, hence enhancing their readiness to use such platforms (Chen et al., 2024; Rosnan and Yusof, 2023).

Institutional theory posits that perceived innovativeness correlates with mimetic pressures, which occur when individuals replicate techniques seen successful or advantageous in unknown circumstances (Alam and Miah, 2024). Agricultural societies often witness farmers observing and learning from the experiences of peers who implement new technologies (Omar et al., 2024; Rosnan

and Yusof, 2023). When digital livestock platforms are regarded as cutting-edge instruments employed by forward-thinking or prosperous farmers, others may replicate similar methods to maintain competitiveness and prevent obsolescence (Burdon and Sorour, 2020). This imitative conduct exemplifies mimetic isomorphism, wherein individuals embrace innovations not solely for their inherent worth but also due to the perceived success and legitimacy of initial adopters (Lee et al., 2024). Perceived innovativeness operates beyond functional evaluation by signaling legitimacy within the institutional environment."

This imitative influence can profoundly affect farmers' readiness to adopt digital technologies (Ravindran et al., 2024). Witnessing the effective implementation of innovative digital platforms by contemporaries diminishes ambiguity and bolsters confidence in the technology's prospective advantages (Omar et al., 2024). As farmers observe the beneficial results such as improved supply chain transparency and productivity, achieved by early adopters, they cultivate more receptiveness to embracing analogous technology (Ab Rahman et al., 2024). Consequently, perceived innovativeness enhances attitudinal readiness by motivating farmers to adopt successful innovative practices observed within their agricultural networks (Lee et al., 2024; En and Hui, 2023). Therefore,

H_6: Perceived innovativeness influence farmers' attitudinal readiness toward behavioral intention of using digital livestock platforms.

2.3. The Linkage between Attitudinal Readiness and Behavioral Intention

Attitudinal readiness significantly influences individuals' behavioral intentions to adopt new technologies, especially in contexts where institutional frameworks affect decision-making (Lee et al., 2024). Attitudinal readiness denotes an individual's willingness to interact with technological advancements, indicating the degree to which individuals feel confident, motivated, and receptive to adopting new systems (Chindasombatcharoen et al., 2024). In the realm of digital livestock platforms, attitudinal readiness denotes farmers' cognitive acceptance of digital technologies as effective instruments for optimizing livestock management, augmenting productivity, and improving market connectivity (Glaros et al., 2023). When farmers cultivate favorable dispositions for digital innovation, they are more inclined to convert these dispositions into a robust intention to accept and employ such platforms in their daily agricultural practices (Ahmed et al., 2024).

According to institutional theory, behavioral intentions are frequently influenced by overarching institutional pressures; coercive, normative, and mimetic that affect individuals' attitudes and beliefs toward innovation (Lee et al., 2024). Institutional environments comprise regulatory frameworks, social conventions, and collective ideas that direct individual behavior within a specific system (Alam and Miah, 2024). Farmers are more inclined to cultivate positive attitudes towards digital platforms when they function within an institutional framework that fosters digital transformation in agriculture, facilitated by national policies, technological assistance, and industry standards (Hassim et al., 2024; Lee et al., 2024). Institutional effects shape farmers' attitudinal readiness by legitimizing the adoption of digital technologies within current agricultural methods (Alam and Miah, 2024).

As farmers enhance their preparedness to use digital technology, this readiness acts as a crucial conduit for transforming institutional influences into tangible behavioral intentions (Ahmed et al., 2024; Sandhu et al., 2024). Institutional pressures alone may not immediately result in technology adoption unless individuals first cultivate a favorable psychological disposition towards the technology (Chindasombatcharoen et al., 2024; Li et al., 2024). Attitudinal readiness serves as a catalyst that transforms institutional signals and technology potential into a definitive intention to embrace digital livestock platforms (Fox et al., 2021). Thus, elevated levels of which are anticipated to markedly enhance farmers' intention to utilize digital platforms, thereby promoting the widespread adoption of digital innovations in the livestock farming sector (Lee et al., 2024; En and Hui, 2023). As a result,

H_7: Attitudinal readiness influence farmers' behavioral intention toward using digital livestock platforms.

2.4. The Mediating Role of Attitudinal Readiness

Attitudinal readiness can be understood as a mediating mechanism in institutional theory, as institutional pressures generally do not directly affect behavioral outcomes but instead function through individuals' cognitive and psychological assessments of those pressures (Lee et al., 2024; Ravindran et al., 2024). Institutional theory asserts that conduct is influenced by coercive, normative, and mimetic constraints inherent in the social and organizational context (Alam and Miah, 2024). Individuals actively analyze, integrate, and assess these pressures prior to formulating intentions or taking action (Chindasombatcharoen et al., 2024).

In the realm of digital livestock platform adoption, facilitating conditions, social influence, halal compliance, perceived innovativeness, performance expectancy, and effort expectancy exemplify various types of institutional pressures that indicate the legitimacy and appeal of embracing digital technologies (Omar et al., 2024; Rejeb et al., 2021; En and Hui, 2023). These forces initially influence farmers' attitudinal readiness, receptiveness, and willingness to adopt digital innovation (Chindasombatcharoen et al., 2024).

Farmers are more inclined to utilize digital platforms when they recognize that these platforms are backed by institutional frameworks, socially validated, spiritually compatible, and practically beneficial (Alam and Miah, 2024; Ab Rahman et al., 2024). This attitudinal readiness serves as a medium via which institutional demands are converted into behavioral intention (Sandhu et al., 2024). In the absence of such attentiveness, institutional signals may fail to facilitate adoption, as individuals may continue to exhibit hesitation or resistance (Chindasombatcharoen et al., 2024; Li et al., 2024). Consequently, this serves as a pivotal mediating mechanism elucidating the transformation of institutional forces into farmers' intentions to embrace digital livestock platforms (Fox et al., 2021).

Facilitating conditions symbolize the presence of technical infrastructure, institutional support, and resources that empower

users to utilize a specific technology (Ravindran et al., 2024). In the realm of digital livestock platforms, enabling conditions may encompass internet connectivity, digital devices, training programs, and assistance from agricultural authorities (Hassim et al., 2024; Omar et al., 2024). According to institutional theory, these structural supports signify coercive constraints stemming from formal policies and regulatory frameworks that promote the adoption of modern technology techniques among farmers (Alam and Miah, 2024; Lee et al., 2024). Institutional structures can improve farmers' readiness, since sufficient resources like those offered by the Malaysia Digital Economy Blueprint, mitigate uncertainty and foster confidence in digital innovation (Rosnan and Yusof, 2023).

Social influence designates the degree to which individuals believe that significant others anticipate or promote their use of a specific technology (Chen et al., 2024). Agricultural communities frequently depend on the advice and experiences of peers, extension officers, and community leaders when assessing new technology (Rosnan and Yusof, 2023). Institutional theory conceptualizes these influences as normative pressures, wherein collective expectations and social norms within the agricultural network dictate behavioral choices (Alam and Miah, 2024). When prominent figures in the agricultural sector advocate for digital livestock platforms, farmers exhibit increased confidence and receptiveness to adopting these technologies (Lee et al., 2024; Omar et al., 2024).

Halal compliance represents conformity to Islamic principles regulating the production, handling, and distribution of livestock products (Ariffin et al., 2021; Rejeb et al., 2021). In mostly Muslim agricultural settings, upholding halal integrity serves as both a regulatory obligation and a manifestation of religious and ethical principles (Sutikno and Aji, 2024). From an institutional standpoint, halal compliance is a type of normative pressure, as farmers are required to adhere to halal norms within the livestock supply chain to preserve institutional legitimacy (Aji et al., 2024). Digital livestock platforms employing IoT and blockchain enhance traceability and verification of halal practices, thus, instill confidence in halal integrity (Alshehri, 2023; Yang et al., 2025). Farmers' recognition of these technologies as facilitators of religious duties and ethical consumption enhances their willingness to embrace digital platforms, thereby reinforcing their intention to adopt such technologies (Alam and Miah, 2024; Hakim and Supriyanto, 2024).

Perceived innovativeness signifies the extent to which individuals regard a technology as novel, sophisticated, and capable of enhancing current practices (Ravindran et al., 2024). In livestock farming, digital platforms including data analytics, monitoring tools, and digital traceability systems are regarded as new solutions that improve farm management (En and Hui, 2023; Zaabar et al., 2025). Institutional theory posits that perceptions are influenced by mimetic forces, wherein individuals replicate actions deemed effective or advanced in their milieu to evade obsolescence (Lee et al., 2024). Exposure to the successful use of innovative digital tools by peer farmers positively shapes attitudes toward the adoption of similar technologies. (World Bank, 2024; Omar et al., 2024).

Performance expectancy denotes the conviction that utilizing a technology would enhance work performance and productivity (Ravindran et al., 2024). Digital platforms in livestock farming may facilitate farmers in monitoring herd health, optimizing resource management, and accessing expanded market prospects (Ariffin et al., 2021; Hashom et al., 2023; Zaabar et al., 2025). Farmers recognize the value of innovations when they witness the concrete advantages realized by early adopters, including enhanced supply chain efficiency and food security (Ab Rahman et al., 2024). In institutional theory, such findings create mimetic pressures that push farmers to replicate techniques deemed advantageous (Alam and Miah, 2024; Lee et al., 2024).

Effort expectancy indicates the extent to which individuals regard a technology as user-friendly and congruent with their current practices (Ravindran et al., 2024). Farmers are more inclined to cultivate positive perceptions of digital platforms when they perceive the technology as easy to understand and utilize, especially for small-scale rural operations (Rosnan and Yusof, 2023; Sandhu et al., 2024). Observing their associates effectively utilize digital tools with minimal challenges alleviates technological apprehension and enhances willingness to engage with online platforms (Omar et al., 2024). From the standpoint of institutional theory, this illustrates mimetic pressures, wherein farmers replicate techniques deemed feasible and advantageous within their particular socio-technical milieu (Chen et al., 2024; Lee et al., 2024). Consequently,

$H_{1b\text{-}6b}$: Attitudinal readiness mediates the relationships between the following linkages: Facilitating conditions (H_{1b}), halal compliance (H_{2b}), social influence (H_{3b}), effort expectancy (H_{4b}), performance expectancy (H_{5b}), and perceived innovativeness (H_{6b}) towards farmers' behavioral intention of using digital livestock platforms.

3. RESEARCH METHODOLOGY

3.1. Participants and Sampling Method

This study's emphasis on livestock producers is conceptually and practically warranted regarding digital platform adoption. Livestock farming constitutes a sub-sector of agriculture that increasingly depends on continuous monitoring, real-time data management, and supply chain traceability, all of which can be substantially improved by digital platforms (Alshehri, 2023; Zaabar et al., 2025). In contrast to crop-based agriculture, livestock operations encompass dynamic processes including animal health monitoring, feeding regimens, breeding management, and disease control, necessitating timely and precise information (Ariffin et al., 2021; Zaabar et al., 2025). Consequently, digital livestock platforms have significant opportunities to enhance operational efficiency, decision-making, and production within this industry (Ab Rahman et al., 2024).

Moreover, the livestock sector is essential for maintaining food security and facilitating the halal supply chain in Malaysia, especially for meat production and distribution (Ariffin et al., 2021; Ab Rahman et al., 2024). The incorporation of digital platforms in livestock production pertains not only to technology progress but also to concerns over traceability, transparency, and adherence to

halal requirements (Rejeb et al., 2021). Livestock farmers represent a pertinent demographic for analyzing the influence of factors such as halal compliance, institutional pressures, and technical perspectives on behavioral intention (Sutikno and Aji, 2024). From a research standpoint, concentrating on livestock producers also fills a void in the literature, as several existing studies on digital agriculture adoption primarily focus on crop farming or general agricultural practices (Zaabar et al., 2025). This study focuses on livestock farmers, offering context-specific insights about the use of digital platforms in a sector where digitalization directly influences productivity, sustainability, and supply chain integrity (Hashom, et al., 2021).

Academic authorities and experts in agricultural technology and research methodologies assessed the survey questionnaire to ensure content validity (Chen et al., 2024). To ensure measurement quality, a pilot study involving 20 livestock producers was conducted to examine the clarity, relevance, and comprehensibility of the questionnaire items (Li et al., 2024). The reliability and contextual appropriateness of the measurement tool were improved by minor modifications based on feedback obtained during the pilot phase (Ahmed et al., 2023). Additionally, procedural remedies were employed to mitigate common technique bias, such as providing explicit instructions, ensuring respondent anonymity, and distinguishing between predictor and criterion variables in the questionnaire. These measures were implemented to improve the overall rigor, dependability, and validity of the data collection process.

The data collection employed an online survey method, deemed suitable due to the rising prevalence of smartphones and digital communication tools among farmers, alongside the increasing focus on digital agriculture initiatives advocated by governmental and agricultural organizations (Rosnan and Yusof, 2023). The implementation of online distribution allowed for expanded geographic reach, minimized logistical challenges linked to field-based data collecting, and promoted effective data acquisition among scattered farming groups (Ravindran et al., 2024); furthermore, conducting the poll in a digital format provided congruence with the study's setting, as digital livestock platforms are inherently technology-driven (En and Hui, 2023).

A total of 254 responses were gathered and preserved for analysis following a review for completeness and consistency (Table 1). To improve data dependability, screening questions were implemented to guarantee that only participants engaged in livestock farming took part in the survey. Additionally, response time evaluations and duplicate-entry filters were implemented to reduce invalid responses. The sample exhibited a predominance of male respondents (85.8%), whereas female participants represented a lesser fraction (14.2%, n = 36). This distribution illustrates the gender mix of the livestock farming sector in Malaysia, which is conventionally male-dominated due to the physically arduous nature of livestock husbandry and cultural norms related to agricultural labor. Nonetheless, the engagement of female responders signifies an increasing participation of women in agricultural endeavors and digital integration. Additional demographic profile encompassed age, farming experience, type of livestock managed (e.g., cattle, poultry, goats), monthly income, yielding a thorough comprehension of respondents' socio-economic background and agricultural attributes.

Table 1: Profile of respondents

Demographic	Categories	Respondents (n)	Percentage
Gender	Male	218	85.8
	Female	36	14.2
Age (Years)	18-30	52	20.5
	31-40	78	30.7
	41-50	69	27.2
	51 and above	55	21.6
Farming experience	<5 years	58	22.8
	5-10 years	86	33.9
	More than 10 years	110	43.3
Type of livestock	Poultry	97	38.2
	Cattle	68	26.8
	Goat/Sheep	89	35
Monthly income (RM)	RM1,200 and below	41	16.1
	RM1,201-RM5,000	149	58.7
	RM5,001-RM10,000	49	19.3
	RM10,001 and above	15	5.9

The authors' own data based on the survey

3.2. Instrument

The measurement scales employed in this investigation were sourced from previous research. Initially created in English, these measurement scales have undergone back-translation into Malay (Triandis and Brislin, 1984; Behling and Law, 2000). A professional translator and a multilingual researcher were employed for the back translation and validation of the decoded versions (Hair et al., 2019). Twenty farmers were requested to partake in a pilot test to assess the clarity and interpretations of the measurement items. All recognized misconceptions along this procedure were addressed. All inquiries were evaluated utilizing a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." All dimensions in this study were assessed using multi-item measures developed from previously validated research, with wording modified to align with the context of digital livestock platform adoption among farmers.

Perceived innovativeness was measured using items adapted from Rogers (2003) and later operationalizations by Agarwal and Prasad (1998), reflecting the extent to which farmers perceive digital platforms as novel and advanced. A sample item is: "Using digital livestock platforms represents an innovative way of managing farming activities."

Performance expectancy, effort expectancy, social influence, and facilitating conditions were measured based on the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003). Performance expectancy captures perceived benefits (e.g., "Using digital livestock platforms improves my farming productivity"), while effort expectancy reflects ease of use (e.g., "Learning to use digital livestock platforms is easy for me"). Social influence measures perceived

social pressure (e.g., "People important to me think I should use digital livestock platforms"), and facilitating conditions assess the availability of resources and support (e.g., "I have the necessary resources to use digital livestock platforms").

Halal compliance was adapted from studies on Islamic consumption and technology adoption such as Aji et al. (2024) and Lada et al. (2009), capturing farmers' perceptions of adherence to Islamic principles. A sample item is: "Digital livestock platforms comply with halal and Shariah principles in livestock management."

Attitudinal readiness was adapted from technology readiness and attitude literature, including Parasuraman (2000) and Venkatesh et al. (2003), reflecting farmers' psychological readiness to adopt digital platforms. A sample item is: "I am mentally prepared to adopt digital livestock platforms in my farming activities."

Behavioral intention was measured using items adapted from Venkatesh et al. (2003) and Davis (1989), capturing farmers' intention to adopt the technology. A sample item is: "I intend to use digital livestock platforms in my farming operations in the future." All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4. DATA ANALYSIS

The analysis of data derived from 254 valid responses was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS. PLS-SEM was chosen for its appropriateness in exploratory research, predictive modeling, and its capacity to manage intricate models with numerous constructs and indicators, especially when the data does not necessitate stringent normality assumptions. Moreover, PLS-SEM is employed due to its emphasis on prediction and theory construction rather than model fit, rendering it appropriate for investigating behavioral intention in nascent situations like digital livestock platform adoption.

The analysis was performed in two phases. The measuring model (Table 2) was initially assessed to evaluate the reliability and validity of the constructs. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR), whereas convergent validity was measured by average variance extracted (AVE). The Heterotrait-Monotrait ratio (HTMT) was employed to assess discriminant validity. The structural model was evaluated to investigate the proposed links among constructs. Path coefficients (β), t-values, and P-values were derived by a bootstrapping process to assess the significance of the connections. Furthermore, the coefficient of determination (R^2) was employed to assess the model's explanatory capacity, while effect size (f^2) was analyzed to measure the contribution of each exogenous construct. The mediation effects were investigated to ascertain the indirect impact of attitudinal readiness on behavioral intention.

The research evaluates discriminant validity by the heterotrait–monotrait (HTMT) ratio of correlations, as advised by Henseler et al. (2015) and subsequently enhanced by Franke and Sarstedt (2019). A threshold value of 0.85 is deemed more conservative, whilst 0.90 is viewed as a more liberal criterion for determining discriminant validity. Table 3 illustrates that the majority of HTMT values are below the suggested threshold of 0.90, signifying that most conceptions exhibit sufficient discriminant validity. All HTMT values are below the critical threshold of 0.90, indicating that the constructs are empirically distinct (Table 3).

4.1. Structural Model Assessment

Gefen et al. (2000) identified two criteria for evaluating the structural model (Figure 1), the model's explanatory power,

Table 2: Measurement model

Construct	Item	Loading (>0.5)	Cronbach alpha (>0.7)	Composite reliability (>0.7)	AVE (>0.5)
Perceived innovativeness	Pin1	0.699	0.770	0.857	0.669
	Pin2	0.853			
	Pin4	0.889			
Performance expectancy	Pe1	0.822	0.797	0.880	0.709
	Pe2	0.852			
	Pe3	0.852			
Effort expectancy	Ee1	0.719	0.717	0.840	0.638
	Ee3	0.872			
	Ee4	0.797			
Social influence	Si1	0.811	0.822	0.885	0.719
	Si3	0.866			
	Si4	0.866			
Facilitating conditions	Fc2	0.793	0.703	0.827	0.615
	Fc3	0.732			
	Fc4	0.824			
Halal compliance	Hc1	0.575	0.735	0.756	0.521
	Hc2	0.930			
	Hc5	0.605			
Attitudinal readiness	A2	0.927	0.853	0.932	0.872
	A3	0.941			
Behavioral intention	Bi1	0.575	0.768	0.863	0.679
	Bi2	0.930			
	Bi4	0.605			

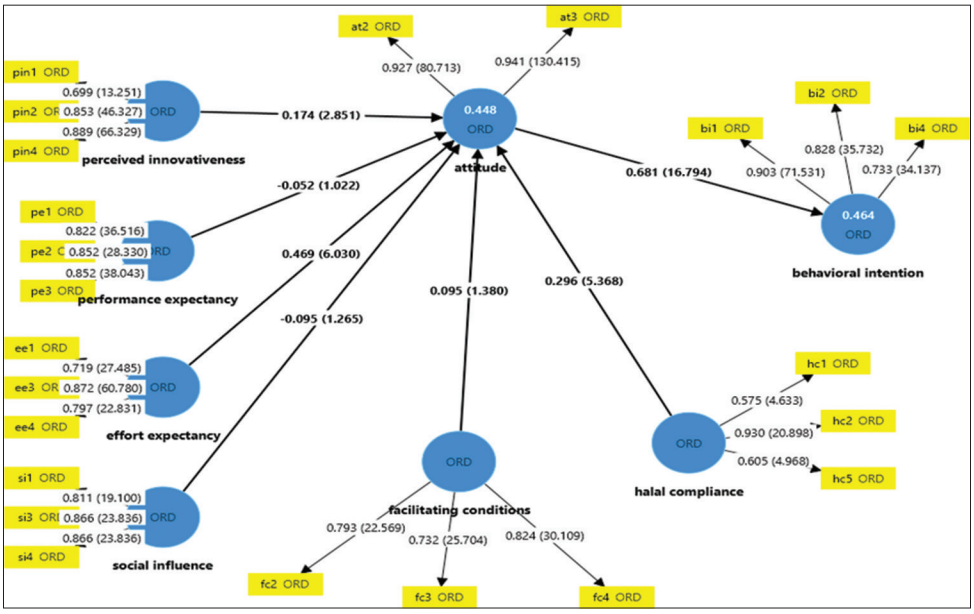
Results from the authors' survey data

Table 3: Discriminant validity via HTMT

Construct	1	2	3	4	5	6	7
Attitude							
Behavioral intention	0.807						
Effort expectancy	0.655	0.681					
Facilitating conditions	0.559	0.829	0.687				
Halal compliance	0.351	0.649	0.263	0.331			
Perceived innovativeness	0.544	0.669	0.526	0.593	0.553		
Performance expectancy	0.410	0.744	0.707	0.581	0.239	0.609	
Social influence	0.396	0.524	0.692	0.569	0.247	0.389	0.384

Results from the authors' survey data

Figure 1: Hypothesized model of the study



Source: Authors' survey data

R-square, and the coefficient of determination; as well as the value and significance of the path coefficients, which represent the estimated path relationships associated with the standardized betas in regression analysis.

Cohen et al. (2013) classify R-square values as small if they range from 0.02 to 0.13, medium from 0.13 to 0.25, and large from 0.26 or higher. In the proposed model, Structural Equation Modeling (SEM) was employed to examine the relationships between institutional factors and farmers' behavioral intention to use digital livestock platforms. As shown in Table 4, halal compliance ($\beta = 0.296$, $P < 0.001$), effort expectancy ($\beta = 0.469$, $P < 0.001$), and perceived innovativeness ($\beta = 0.174$, $P < 0.01$) were found to have statistically significant positive effects on attitudinal readiness.

In contrast, facilitating conditions ($\beta = 0.095$, $P > 0.05$), social influence ($\beta = -0.095$, $P > 0.05$), and performance expectancy ($\beta = -0.052$, $P > 0.05$) did not show significant effects on attitudinal readiness. Accordingly, hypotheses H_2, H_4, and H_6 were supported, while H_1, H_3, and H_5 were not supported. Furthermore, attitudinal readiness demonstrated a strong and significant positive effect on behavioral intention ($\beta = 0.681$, $P < 0.001$), supporting H_7. The model explains 45% of the variance in attitudinal readiness and 46% of the variance in behavioral intention. Ultimately, the majority of the R-square values exceed 0.26, thus demonstrating robust support for the structural model (Fornell and Larcker, 1981; Hair et al., 2018).

4.2. Mediating Effects of Attitudinal Readiness

The mediating role of attitudinal readiness was examined to assess whether it significantly transmits the effects of institutional and technological factors on farmers' behavioral intention to use digital livestock platforms. The results (Table 5) indicate that attitudinal readiness significantly mediates the relationships between halal compliance ($\beta = 0.202$, $P < 0.001$), perceived innovativeness ($\beta = 0.119$, $P < 0.01$), and effort expectancy ($\beta = 0.319$, $P < 0.001$) and behavioral intention. These findings suggest that these factors influence behavioral intention indirectly through enhancing farmers' attitudinal readiness toward digital platforms. In contrast, the mediating effects of attitudinal readiness were not supported for facilitating conditions ($\beta = 0.065$, $P > 0.05$), social influence ($\beta = -0.065$, $P > 0.05$), and performance expectancy ($\beta = -0.035$, $P > 0.05$), as their indirect effects were not statistically significant. Accordingly, hypotheses H_{2b}, H_{4b}, and H_{6b} were supported, while H_{1b}, H_{3b}, and H_{5b} were not supported. Overall, these results highlight that attitudinal readiness serves as a significant mediating mechanism for selected institutional and mimetic factors, reinforcing its role in translating key drivers into behavioral intention among farmers.

Table 4: Summary of the hypothesis testing

Hypo	Path	Original sample (O)	Standard deviation	T statistics (|O/STDEV|)	P-values	R^2	f^2	Result
H_1	(Coercive) Facilitating condition-> attitudinal readiness	0.095	0.069	1.380	0.168		0.009	Not Supported
H_2	(Normative) Halal compliance-> attitudinal readiness	0.296	0.055	5.368	0.000*		0.245	Supported
H_3	(Normative) Social influence -> attitudinal readiness	−0.095	−0.096	1.265	0.206		0.015	Not Supported
H_4	(Mimetic) Effort expectancy -> attitudinal readiness	0.469	0.078	6.030	0.000*	Attitudinal readiness=45%	0.309	Supported
H_5	(Mimetic) Performance expectancy -> attitudinal readiness	−0.052	0.051	1.022	0.307		0.012	Not Supported
H_6	(Mimetic) Perceived innovativeness -> attitudinal readiness	0.174	0.061	2.851	0.004		0.029	Supported
H_7	Attitudinal readiness -- > behavioral intention	0.681	0.041	16.794	0.000*	Behavioral intention=46%	0.342	Supported

*P<0.05, ***P<0.001, NS: Not Support, P>0.05. Source: Authors' survey data

Table 5: Mediating effect of attitudinal readiness

Relations		Standard beta	Standard deviation	T statistics	P-values	Result
H_{1b}	Facilitating conditions -> attidudinal->bi	0.065	0.049	1.335	0.182	Not supported
H_{2b}	Halal compliance -> att-> behavioral intention	0.202	0.040	5.043	0.000	Supported
H_{3b}	Social influence -> att-> behavioral intention	−0.065	0.051	1.274	0.203	Not supported
H_{4b}	Effort expectancy -> att-> behavioral intention	0.319	0.052	6.113	0.000	Supported
H_{5b}	Performance expectancy -> att-> behavioral intention	−0.035	0.034	1.038	0.299	Not supported
H_{6b}	Perceived innovativeness -> att-> behavioral intention	0.119	0.041	2.916	0.004	Supported

*P<0.05, ***P<0.001, NS: Not support, P>0.05. Source: Authors' survey data

5. CONCLUSION, DISCUSSION AND THEORETICAL CONTRIBUTIONS

This study enhances Institutional Theory by empirically differentiating the effects of institutional forces. The existence of many non-significant interactions underscores critical complexities in the functioning of institutional forces regarding the adoption of digital livestock platforms (Alam and Miah, 2024; Lee et al., 2024). The negligible impact of facilitating conditions on attitudinal readiness indicates that coercive pressures—such as infrastructure provision, institutional support, and policy-driven digitalization—may not be adequately internalized by farmers as motivational incentives (Omar et al., 2024; Ravindran et al., 2024). Although these conditions diminish structural obstacles, they do not inherently foster attitudinal readiness, especially in rural agricultural contexts where the adoption of technology is frequently determined more by perceived significance than by simple accessibility (Hassim et al., 2024; Rosnan and Yusof, 2023). It indicates that only supplying the requisite infrastructure, resources, or authoritative directives is inadequate for securing users' mental and emotional engagement (Omar et al., 2024). Legitimate readiness cannot be compelled solely by structural support; it necessitates intrinsic alignment with the user's values and a favorable user experience (Chindasombatcharoen et al., 2024).

The insignificant effect of social influence suggests that normative pressures within farming communities may be relatively weak or fragmented (Chen et al., 2024). Unlike more interconnected or urban contexts, farmers often operate in dispersed environments where peer endorsement and collective expectations exert limited influence, particularly when trust in informal networks outweighs broader social persuasion (Ahmed et al., 2024; Rosnan and Yusof, 2023). In contrast, halal compliance emerges as a more salient normative force, indicating that value-based norms grounded in religious obligations exert stronger influence than general social pressures (Alam and Miah, 2024; Rejeb et al., 2021). This implies that, within this research context, deeply embedded cultural, religious, and industry-specific standards serve as the primary drivers of acceptance (Aji et al., 2024; Sutikno and Aji, 2024). Consequently, farmers' attitudes are shaped not merely by peer behavior but by adherence to established ethical and quality principles, reflecting a value-driven rather than socially driven decision-making process (Kurniawan et al., 2025).

The insignificant effect of performance expectancy suggests that mimetic pressures driven by observable benefits may not be sufficiently visible or convincing in this context (Chindasombatcharoen et al., 2024). This may be attributed to limited exposure to successful adopters or a lack of clear evidence demonstrating improved outcomes, thereby constraining farmers' tendency to imitate others (Omar et al., 2024; En and Hui, 2023). In contrast, the significance of effort expectancy and perceived innovativeness indicates that simplicity and perceived novelty serve as more influential cues for imitation than performance-based outcomes, particularly under conditions of uncertainty regarding technological benefits (Fox et al., 2021). Furthermore, farmers' attitudinal readiness appears to be shaped more by the perceived ease of use and perceived innovativeness, than by its actual functional advantages (Li et al., 2024; Sandhu et al., 2024). This implies that overcoming initial resistance to adoption depends largely on delivering intuitive and innovative user experiences,

rather than solely emphasizing improvements in performance (Ravindran et al., 2024).

The comprehensive model robustly confirms that attitudinal readiness effectively and significantly converts into behavioral intention (Chindasombatcharoen et al., 2024). The model accounts for over half of the variance in both readiness and intention, confirming that psychological preparation is the essential link to actual adoption (Ravindran et al., 2024). These findings indicate a highly specialized adoption environment (Lee et al., 2024; Rejeb et al., 2021). To address the study issue of motivating behavioral intention, stakeholders must shift their focus from broad social pressures, rigid performance measures, or fundamental infrastructural support (Hassim et al., 2024; Omar et al., 2024). Success relies on a twofold strategy: maintaining rigorous adherence to fundamental cultural and specialized norms while providing an intuitive and innovative user experience (Kurniawan et al., 2025). The significance of halal compliance underscores the influence of religio-cultural norms as a primary institutional mechanism, hence expanding Institutional Theory into the realm of Islamic and halal-oriented decision-making (Alam and Miah, 2024; Davids and Sabrain, 2022).

The mediating analysis offers important insights into the psychological mechanisms underlying farmers' adoption decisions, particularly within a context shaped by Islamic values, as reflected in halal compliance (Alam and Miah, 2024). The findings demonstrate that attitudinal readiness functions as an effective mediating pathway only for specific intrinsic attributes—namely halal compliance, perceived innovativeness, and effort expectancy (Aji et al., 2024; Sutikno and Aji, 2024). This suggests that farmers' intentions are primarily influenced by internal evaluations, including the alignment of digital platforms with religious values, the perception of technological novelty, and the ease of use (Agarwal and Prasad, 1998; Alam and Miah, 2024; Sandhu et al., 2024).

In contrast, external influences such as social pressure, facilitating conditions and performance expectancy do not significantly translate into behavioral intention through attitudinal readiness (Chen et al., 2024; Omar et al., 2024). This indicates that, in this context, adoption is less driven by collective endorsement or structural support and more by individual cognitive and value-based assessments. Consequently, strategies relying on social proof or infrastructural provision alone may be insufficient. Instead, greater emphasis should be placed on enhancing perceived usability, innovation, and alignment with ethical and religious values to effectively shape farmers' attitudes and drive adoption (Hassim et al., 2024; Rosnan and Yusof, 2023).

5.1. Managerial Implications

The results present significant implications for platform developers, agriculture-tech companies, and industry professionals engaged in digital solutions for the livestock industry. The significant impact of effort expectancy highlights the necessity for an exceptionally intuitive and user-friendly platform design. Developers must prioritize simplicity, intuitive navigation, and minimal technological complexity to cater to farmers with diverse levels of digital literacy. This indicates that usability testing and farmer-centric design methodologies are essential for improving adoption results.

Beyond usability and halal integrity, platform managers must address the emerging "trust gap" regarding data ownership and ethical governance (Singh et al., 2024). Farmers are increasingly concerned that agri-tech providers may profit from their raw data or that sensitive farm locations could be exposed to third parties (Rozenstein et al., 2023). Consequently, managers should implement ethical data governance frameworks that prioritize farmer autonomy, including secure storage, end-to-end encryption, and transparent "informed consent" mechanisms for data sharing (Han et al., 2025).

In the Malaysian livestock sector, which is evolving from small-scale farming to more structured commercial systems, managers should utilize blockchain-based traceability to enhance economic value (Ariffin et al., 2021; Hashom et al., 2023). This technology can be integrated with HACCP standards and Islamic dietary principles to enable real-time verification, supporting the development of a "Smart Halal Supply Chain" (Krishnan, 2025; Rejeb, 2018). By ensuring secure and transparent records of animal health and slaughtering processes, firms can position their digital solutions as a premium standard in both domestic and global halal markets (Ali et al., 2021).

Managers must recognize that adoption intentions are hindered by a lack of clarity in technology service agreements (Bekee et al., 2024). To mitigate this, firms should adopt standardized data collection methods (such as ISO guidelines) and ensure that contracts clearly define data usage rights to prevent "price speculation" in livestock markets (Dougherty et al., 2023). This is particularly critical for Malaysian SME enterprises, where technological readiness is heavily dependent on the reliability and transparency of vendor support (Diana et al., 2024).

Instead of promoting isolated platforms, industry professionals should focus on creating networked digital ecosystems (Singh et al., 2024). This involves collaborative data-sharing models where aggregated, anonymized data from multiple intensive livestock operations can be used for predictive analytics while protecting individual farm signatures (Rozenstein et al., 2023). Such ecosystems enable farmers to collectively tackle climate challenges and food security issues, shifting the value proposition from individual productivity to community-wide resilience (Osrof et al., 2023).

Finally, while initial adoption is driven by social influence and innovativeness, long-term continued use is contingent on the platform's ability to minimize "work impediments" (Fox et al., 2021). Managers should employ co-creation methodologies, involving livestock farmers directly in the iterative design of decision-support tools (Hassim et al., 2024; Li et al., 2024). This ensures a "contextual fit" where the technology does not disrupt existing agricultural routines but rather enhances the speed and effectiveness of information extraction (Osrof et al., 2023; Rozenstein et al., 2023).

5.2. Policy Implications

The research offers significant insights for policymakers aiming to further digital transformation in Malaysia's livestock and halal sectors (World Bank, 2024; Hassim et al., 2024). The findings indicate that governmental initiatives should transition from merely providing infrastructure to adopting a more user-centric digitalization strategy (Omar et al., 2024). Despite enhanced access to digital tools, their adoption is dependent on usability and perceived relevance (Rosnan and Yusof, 2023). Policymakers should consequently allocate resources to capacity-building efforts that prioritize practical skills, user experience, and ongoing assistance for farmers (Chindasombatcharoen et al., 2024).

Secondly, the significant impact of halal compliance highlights the necessity to enhance digital halal certification frameworks (Kurniawan et al., 2025; Rejeb et al., 2021). Government authorities ought to promote the incorporation of halal certification and monitoring systems into digital platforms, so ensuring comprehensive traceability throughout the livestock value chain (Ariffin et al., 2021). This will not only bolster trust among farmers but also solidify Malaysia's status as a leader in the global halal economy (Ariffin et al., 2021; Davids and Sabrain, 2022).

Thirdly, the limited impact of performance expectancy indicates a disparity in trust and perception of the tangible advantages of digital platforms (Chindasombatcharoen et al., 2024). Policymakers must tackle this issue by fostering openness, uniformity, and accountability in digital ecosystems (World Bank, 2024; Rejeb et al., 2021). This may involve formulating protocols for platform stability, data security, and dispute resolution systems to bolster user trust (Lee et al., 2024).

Moreover, due to the restricted impact of social influence, conventional awareness campaigns may prove inadequate for fostering adoption (Chen et al., 2024). Policy initiatives ought to prioritize demonstration-based strategies, including pilot projects, model farms, and community-oriented digital adoption programs (Hassim et al., 2024; Rosnan and Yusof, 2023). These projects can offer concrete proof of value and mitigate perceived dangers linked to new technology (Ahmed et al., 2024; World Bank, 2024).

The crucial influence of attitudinal readiness underscores the significance of behavior-focused policy interventions (Chindasombatcharoen et al., 2024). Policymakers must develop initiatives that progressively cultivate favorable perceptions of digital adoption, incorporating incentives, and tailored assistance for various farmer demographics (Omar et al., 2024). These methods can promote a more sustainable and inclusive digital transformation in the livestock sector (Alam and Miah, 2024).

5.3. Limitation and Future Research Contribution

This study has various limitations that suggest opportunities for future investigation. The study primarily examines livestock farmers in West Malaysia, perhaps constraining the applicability of the findings to other agricultural sectors or geographic regions. Agricultural practices, technical access, and institutional frameworks may vary by area, especially between Peninsular and East Malaysia or among different agricultural types. Subsequent investigations may broaden this model to more agricultural sectors or perform cross-regional analyses to improve external validity. Secondly, the study used a cross-sectional methodology, collecting farmers' perceptions at a singular moment in time. Given that technology adoption is a dynamic process, longitudinal studies are advisable to investigate the evolution of attitudinal readiness and behavioral intention over time, especially as digital platforms become increasingly integrated into agricultural activities.

This study incorporates institutional theory, concentrating mainly on specific conceptions that exemplify coercive, normative, and mimetic constraints. Additional pertinent variables, including trust in digital platforms, perceived risk, digital literacy, and the efficacy of government policies, were excluded and may further elucidate adoption behavior. Subsequent study may integrate these elements to develop a more exhaustive model. Furthermore, while attitudinal readiness was analyzed as a mediating variable, different mechanisms such as trust or perceived value might be investigated as mediators or moderators to yield more profound insights into the adoption process.

Future research may utilize mixed-method approaches, incorporating qualitative interviews or experimental designs, to triangulate results and improve robustness. Future study should focus on refining the theoretical model, broadening contextual coverage, and investigating supplementary psychological and institutional factors to enhance the understanding of digital platform adoption in the agricultural industry.

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