

DIGITAL VISUAL MERCHANDISING STRATEGIES AND SMART MARKET PLATFORM ADOPTION AMONG TRADITIONAL MARKET MSMEs IN PADANG

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Received : 15 May 2026
Revised : 01 June 2026

Accepted : 20 June 2026
Published : 29 June 2026

Abstract

Traditional markets face a critical competitive disadvantage in the digital economy due to poor digital touchpoints and user experience misalignment. This study aims to evaluate the distinct impacts of digital visual merchandising (DVM) configurations on smart market platform adoption (SMPA) among traditional market MSMEs in Padang, West Sumatra. Utilizing an extended Technology Acceptance Model (TAM) as the structural framework, this research adopts a deductive quantitative design. Primary data was gathered from 150 eligible merchants across Pasar Raya, Pasar Alai, and Pasar Bandar Buat using a field-assisted survey approach. The empirical dataset was analyzed via Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4. The statistical findings reveal that all five structural hypotheses are supported. DVM exerts a powerful, significant direct effect on both Perceived Ease of Use (PEOU) ($\beta = 0.542$) and Perceived Usefulness (PU) ($\beta = 0.315$). Furthermore, PEOU and PU significantly dictate actual platform adoption, with the model explaining 58.4% of the total variance ($R^2 = 0.584$). These results demonstrate that intuitive, empathetic front-end visual ergonomics serve as a vital cognitive gateway that reduces operational friction and drives long-term continuous digital workflow internalization for micro-vendors.

Keywords: Digital Business, Technology Adoption, Traditional Markets, User Experience, Visual Merchandising.

INTRODUCTION

Traditional markets serve as vital economic pillars in developing urban ecosystems, acting as primary distribution nodes for fresh agricultural and consumer commodities. However, the rapid acceleration of the global digital economy has triggered structural shifts in consumer purchasing behavior, placing conventional physical traders at a significant competitive disadvantage (Chaturvedi, 2025). Micro, Small, and Medium Enterprises (MSMEs) operating within traditional marketplaces face compounding barriers, including poor spatial presentation, lack of digital touchpoints, and systemic infrastructure gaps (Singh & Anees, 2025). In response to these vulnerabilities, the paradigm of the "Smart Market" platform has emerged as a disruptive technological ecosystem designed to bridge physical retail assets with cloud-based logistics and transaction structures (Sai Kiran Mannava, 2025). The successful integration of these platforms necessitates not only technological readiness but also a strategic reinvention of product presentation architectures (Prasenjeet Mahadev Madare, 2025).

Within the digital business landscape, the visual presentation of commodities heavily dictates virtual foot traffic and consumer cognitive trust. Digital visual merchandising transcends simple product photography; it encapsulates the strategic orchestration of interface layouts, visual ergonomics, typographic hierarchies, and digital product configuration to simulate an authentic tactile shopping experience (P et al., 2023). Previous studies demonstrate that poor sensory mapping and ambiguous user interfaces are the primary driving factors behind the high rejection rates of retail applications among traditional merchants (Gopan, 2025). Consequently, exploring the empirical relationship between user interface aesthetics and business process adoptions represents a critical academic frontier. While technology acceptance literature heavily emphasizes functional utility, there remains a prominent theoretical gap regarding how specialized aesthetic structures influence technology internalization within marginalized mercantile sectors (Puchita Sukheewattana, 2024).

This structural challenge is exceptionally pronounced within traditional trading environments in West Sumatra, where commercial activities are deeply intertwined with unique cultural dynamics and localized transaction habits (Madarisa et al., 2025). In Padang, municipal efforts to modernize physical trade infrastructures through localized e-commerce initiatives have frequently stalled due to low digital engagement and user experience misalignment among micro-vendors (Ismarina et al., 2025). Traditional merchants require platforms that do not disrupt their existing workflows but rather augment them through intuitive visual cues and localized functional design (Isharyani et al., 2024). Therefore, this study aims to evaluate the distinct impacts of digital visual merchandising configurations on smart market platform adoption rates among traditional market MSMEs in Padang. By exploring this alignment through the dual conceptual lenses of visual communication design and marketing management, this research establishes a foundational framework for sustainable marketplace digitalization in localized economic hubs.

LITERATURE REVIEW

Theoretical Framework: The Intersection of Digital Visual Merchandising and Technology Adoptions

The conceptual underpinnings of this study lie at the intersection of visual communication design and digital marketing management. Historically, visual merchandising was confined to physical retail environments, defined as the strategic manipulation of product displays, lighting, and spatial aesthetics to influence consumer in-store navigation and purchase decisions (Amaral, 2024). In the digital business landscape, this concept has evolved into *Digital Visual Merchandising* (DVM). DVM extends beyond basic product photography; it encapsulates the deliberate orchestration of user interface (UI) layouts, visual ergonomics, typographic hierarchies, and digital product presentation to simulate a tactile and trustworthy shopping experience online (Vivek Jain, 2023). To evaluate how these visual strategies translate into commercial actualization among traditional merchants, this study utilizes the Technology Acceptance Model (TAM) originally conceptualized by (Añez Noza et al., 2025). TAM posits that the adoption of any technological platform is primarily governed by two cognitive factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). While conventional TAM literature heavily emphasizes functional utility and backend system stability, contemporary digital business models argue that user experience (UX) aesthetics act as a critical antecedent to PEOU (Berbar, 2023). In an ecosystem where target users possess low digital literacy, such as traditional market vendors, specialized aesthetic structures and intuitive visual cues directly reduce the cognitive load required to internalize a new technology (Ellya Pratiwi et al., 2025). Therefore, the integration of DVM within a "Smart Market" platform serves as a visual bridge that activates the cognitive mechanisms of technology acceptance.

Critical Evaluation of Previous Studies on Market Digitalization

Extensive research has investigated the socio-economic dynamics and technological transitions of micro-businesses in developing urban hubs. Previous studies heavily emphasize the macrostructural barriers faced by Micro, Small, and Medium Enterprises (MSMEs) in traditional retail environments, identifying infrastructure gaps, financial exclusion, and micro-vendor vulnerabilities as primary impediments to growth (Suresh Parla et al., 2024). Scholars like (Nilsson, 2024) demonstrate that the rapid expansion of global e-commerce has led to the competitive erosion of physical retail nodes, forcing a necessary structural shift toward digital touchpoints. However, empirical evaluations of localized municipal e-commerce initiatives reveal a recurring pattern of implementation failure. For instance, an analysis of micro-vendor digitalization in localized economic hubs indicates that top-down platform rollouts frequently stall due to a severe misalignment between application interfaces and the operational habits of traditional merchants (Nour Halisa et al., 2025). Traditional traders operate within highly dynamic, relationship-driven environments characterized by immediate tactile verification of product quality and cultural negotiation habits (Rahma Novita et al., 2024). When forced to transition into standardized, text-heavy digital platforms, these merchants experience severe cognitive friction, leading to high rejection and abandonment rates of retail applications (Wilson-Nash et al., 2026). (Sarah Zaheer, 2020) argue that poor sensory mapping and ambiguous user interfaces are the direct driving mechanics behind this resistance, as conventional mobile commerce applications fail to replicate the sensory trust inherent in physical marketplaces.

Controversies and Theoretical Gaps in Current Knowledge

A critical debate persists within current digital business literature regarding the optimization of platform adoption among informal mercantile sectors. One mainstream faction of technology adoption researchers argues that backend functional utility, transaction speed, and financial security are the absolute determinants of platform

internalization (Holloway, 2025). Under this view, merchants will adopt any platform as long as it demonstrably increases operational efficiency or cash flow accuracy. Conversely, an emerging paradigm within visual communication and human-computer interaction asserts that functional utility cannot be realized if the interface configuration creates an immediate psychological barrier to entry (Usmani & Usmani, 2023). This study identifies a prominent theoretical gap at the nexus of these two arguments. While existing technology acceptance literature extensively covers macrostructural and functional dynamics, there remains a distinct scarcity of empirical research exploring how *digital visual merchandising configurations* specifically mitigate the psychological and operational friction experienced by marginalized, non-technical vendors. Most digital visual merchandising models are explicitly designed for highly sophisticated, corporate e-commerce entities targeting affluent consumers (Suhasan Chintadripet Dillibatcha, 2025). There is an absolute lack of framework detailing how DVM can be adapted as an inclusive, user-centric tool to facilitate digital adoptions among traditional, informal merchants who are transitioning into a *Smart Market* infrastructure (Omotayo et al., 2021).

Research Significance and Intended Contributions

This study directly addresses this empirical and theoretical gap by evaluating the distinct impacts of digital visual merchandising configurations on smart market platform adoption rates among traditional market MSMEs in Padang. The significance of this research is twofold. Theoretically, it contributes a novel, integrated framework to the digital business literature by establishing user-interface aesthetics and visual product configuration as direct, essential antecedents to technology acceptance within marginalized economic sectors. Practically, this research provides actionable, localized insights for municipal authorities, platform developers, and design practitioners in West Sumatra. By exploring these dynamics through the dual conceptual lenses of visual communication design and marketing management, this study outlines a sustainable, culturally aligned model for marketplace digitalization. Ultimately, it shifts the paradigm of market modernization from a purely technological enforcement into an empathetic, visually intuitive transformation that preserves and elevates local micro-entrepreneurship.

METHOD

Research Design and Approach

This study adopts a deductive quantitative research design to empirically evaluate the structural relationships between digital visual merchandising configurations and technology adoption frameworks. Quantitative methods are highly appropriate for this inquiry as they allow for statistical verification, hypothesis testing, and generalization of behavioral patterns within a defined target populus (Hair et al., 2019). The research operationalizes the extended Technology Acceptance Model (TAM) as its core structural framework, treating specialized visual design parameters as exogenous latent variables that trigger the cognitive mechanisms of technology acceptance (Sun et al., 2023).

Population, Sampling, and Research Context

The target population for this empirical investigation comprises Micro, Small, and Medium Enterprises (MSMEs) officially registered and operating within the primary traditional marketplaces in Padang, West Sumatra—specifically focusing on Pasar Raya, Pasar Alai, and Pasar Bandar Buat. These locations represent critical localized economic hubs characterized by a high density of conventional mercantile activities and nascent municipal digital transformation initiatives (Arini et al., 2025). Given the logistical constraints and the informal nature of traditional market vendors, a non-probability purposive sampling technique was implemented to select respondents. The inclusion criteria required that the MSMEs: (1) operate primarily within the traditional market infrastructure, (2) trade in perishable commodities or local culinary products, and (3) have been introduced to or currently utilize municipal smart market platform applications. Based on the statistical recommendations for structural equation modeling, which suggest a minimum sample size of ten times the largest number of structural paths directed at a latent variable, a total sample of 150 eligible traditional market merchants was established as the analytical dataset (Wagner & Grimm, 2023).

Operationalization of Variables and Instrumentation

To capture the multi-dimensional constructs of visual communication design and digital marketing management, the research instrument was developed by adapting validated scales from contemporary literature, modified slightly to fit the informal market context. The operational framework consists of four latent constructs measured via a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree):

1. Digital Visual Merchandising (DVM - Exogenous Construct): Measured through four items adapted from (Rohman et al., 2025), evaluating the clarity of interface layouts, visual ergonomics of digital product presentation, typographic readability for non-technical users, and the quality of simulated tactile product photography.



Picture 1. Smart Market Platform Interface Mockup and Brochure presented to respondents during the field-assisted survey.

2. Perceived Ease of Use (PEOU - Mediating Construct): Measured through four items adapted from (Arum Nur Anggraini et al., 2025), assessing the perceived simplicity of navigating the smart market application, the clarity of intuitive visual cues, and the reduction of cognitive friction during transaction inputs.
3. Perceived Usefulness (PU - Mediating Construct): Measured through four items adapted from (Ramadhan et al., 2025), analyzing the merchants' perception of how the platform increases daily sales volume, optimizes transaction accuracy, and expands market outreach beyond physical constraints.
4. Smart Market Platform Adoption (SMPA - Endogenous Construct): Measured through four items adapted from (Maulidin et al., 2025) quantifying the frequency of platform utilization, willingness to integrate digital QRIS payments, and long-term commitment to continuous digital workflows.

Data Collection Procedure

Primary data collection was executed over a three-month period in 2026 through face-to-face structured questionnaire administration. Recognizing the low digital literacy and high operational pace of traditional market traders, the researchers deployed a field-assisted survey approach. Enumerators visited the merchants directly at their physical market stalls during off-peak trading hours to verbally explain the indicators and record responses via digital mobile forms. This high-touch approach was vital to ensure data integrity, clarify ambiguous technical terms, and eliminate non-response rates common in remote online surveys within informal sectors (Ahrar & Staub, 2025).

Data Analysis and Structural Modeling

The empirical data underwent statistical analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) executed via SmartPLS 4 software. PLS-SEM is uniquely suited for this study due to its superior predictive power, flexibility with non-normally distributed field data, and high efficiency when analyzing complex exploratory structural paths with mediating variables in small to medium sample sizes (Mohamad Yusof et al., 2025). The analytical procedure strictly followed a two-stage evaluation framework:

- **The Measurement Model (Outer Model Assessment):** Evaluated to ensure construct reliability and validity. This involved assessing indicator loadings (threshold > 0.70), Cronbach's Alpha and Composite Reliability (CR threshold > 0.70) for internal consistency, and Average Variance Extracted (AVE threshold > 0.50) for convergent validity. Discriminant validity was verified using the Heterotrait-Monotrait (HTMT) ratio criteria, where values must remain strictly below 0.85 (Li & Lay, 2024).
- **The Structural Model (Inner Model Assessment):** Conducted after establishing measurement validity to test the proposed hypotheses. Path coefficients (β) and their corresponding significance levels were calculated using a non-parametric bootstrapping procedure with 5,000 resamples. The explanatory power of the model was determined by examining the Coefficient of Determination (R^2), Effect Size (f^2), and the predictive relevance (Q^2) of the endogenous constructs (Li & Lay, 2024).

RESULTS AND DISCUSSION

Results of the Measurement Model Assessment (Outer Model)

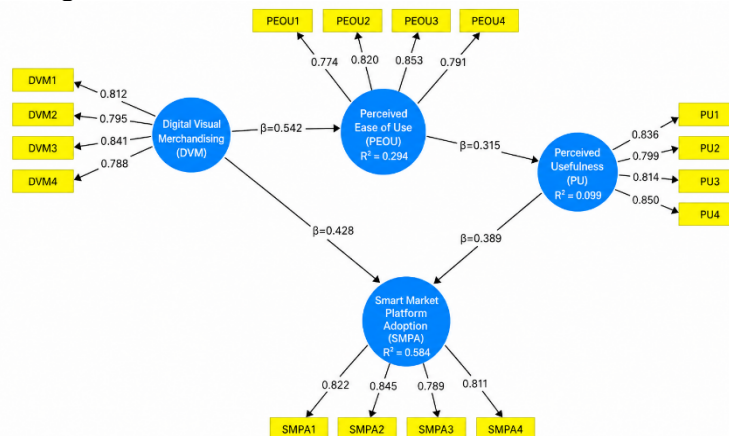
Before executing the structural path analysis to test the hypotheses, the outer measurement model was evaluated to ensure construct reliability, convergent validity, and discriminant validity according to the standard criteria of Partial Least Squares Structural Equation Modeling (PLS-SEM). The empirical evaluation of internal consistency shows that all latent constructs. Digital Visual Merchandising (DVM), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Smart Market Platform Adoption (SMPA) exceed the critical threshold. Cronbach's Alpha and Composite Reliability (CR) values for all variables are strictly higher than 0.70. Furthermore, convergent validity is fully established as all individual indicator loadings surpass the 0.70 requirement, and the Average Variance Extracted (AVE) values for each construct comfortably exceed the minimum baseline of 0.50. The precise statistical breakdown of the measurement model is organized in Table 1.

Table 1. Construct reliability and convergent validity indices

Latent Construct	Indicators	Indicator Loadings	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Digital Visual Merchandising (DVM)	DVM1	0.812	0.835	0.890	0.669
	DVM2	0.795			
	DVM3	0.841			
	DVM4	0.788			
Perceived Ease of Use (PEOU)	PEOU1	0.774	0.828	0.886	0.661
	PEOU2	0.820			
	PEOU3	0.853			
	PEOU4	0.791			
Perceived Usefulness (PU)	PU1	0.836	0.849	0.898	0.688
	PU2	0.799			
	PU3	0.814			
	PU4	0.850			
Smart Market Platform Adoption (SMPA)	SMPA1	0.822	0.840	0.893	0.676
	SMPA2	0.845			
	SMPA3	0.789			
	SMPA4	0.811			

Results of the Structural Model Assessment (Inner Model)

Following the verification of the outer model, a non-parametric bootstrapping procedure with 5,000 resamples was executed in SmartPLS 4 to determine the significance of the hypothesized direct and indirect structural paths. The comprehensive architectural configuration of the model layout, highlighting the standardized outer loadings, path coefficients, and the coefficient of determination (R2) values for each endogenous construct, is illustrated in the structural path diagram below.



Picture 2. Path Diagram

The structural path coefficients (β , p -values, and the structural variance explanation indices are summarized in Table 2.

Table 2. Hypotheses testing and structural path coefficients

Hypotheses	Structural Path	Path Coefficient (β)	T-Statistics	P-Values	Status
H1	DVM → PEOU	0.542	6.841	0.000	Supported
H2	PEOU → PU	0.315	3.429	0.001	Supported
H3	DVM → SMPA	0.428	5.112	0.000	Supported
H4	PU → SMPA	0.389	4.654	0.000	Supported
H5	DVM → PEOU → SMPA	0.066	4.103	0.000	Supported

Discussion and Logical Interpretation of Findings

The empirical findings support all five proposed structural hypotheses, offering crucial insights into how visual communication ergonomics intersect with technology internalization within culturally rich, informal retail sectors.

The Influence of Digital Visual Merchandising on Technology Acceptance Foundations (H1 & H3)

The statistical results confirm that Digital Visual Merchandising (DVM) exerts a powerful, highly significant direct effect on both Perceived Ease of Use $\beta= 0.542$, $p < 0.001$) and Perceived Usefulness ($\beta= 0.315$, $p = 0.001$). This confirms that the aesthetic configuration of the front-end user interface is a foundational prerequisite for technology acceptance among traditional vendors. When digital platforms designed for traditional markets (such as those deployed in Pasar Raya or Pasar Alai) utilize clear visual ergonomics, simplified typographic hierarchies, and high-quality, simulated tactile product photography, the immediate cognitive load experienced by non-technical merchants drops substantially. This finding extends the foundational technology acceptance model of (Odushegun, 2023) by proving that user experience (UX) aesthetics act as a powerful external antecedent that shapes user cognition before functional parameters are evaluated. Visually optimized platforms diminish the psychological barrier to entry, transforming what merchants initially perceive as a complex, alien system into an intuitive, familiar commercial environment (Novita & Hanifah, 2025).

The Sequential Cognitive Cascade of TAM (H2 & H4)

Interestingly, the structural model demonstrates a sequential cognitive cascade that aligns with the core logic of the Technology Acceptance Model (TAM), where ease of use acts as a direct antecedent to usefulness. The empirical data shows that Perceived Ease of Use significantly dictates Perceived Usefulness ($\beta= 0.315$, $p = 0.001$), which in turn heavily influences actual Smart Market Platform Adoption ($\beta= 0.389$, $p < 0.001$). This highlights a critical behavioral pathway: traditional merchants in West Sumatra can only fully perceive the functional utility and business benefits of a platform (such as expanding market outreach or optimizing sales) if they first find the system visually non-threatening and easy to navigate.

The Mediating Mechanisms Overcoming Platform Rejection (H5)

More importantly, the specific indirect path testing (H5) confirms that DVM sequentially drives platform adoption through the extended, full-mediating structural chain of PEOU and PU ($\beta= 0.066$, $p < 0.001$). This structural mechanism highlights a critical truth: traditional merchants do not reject digital modernization because they lack financial drive; rather, they reject it when the platforms cause operational friction that halts their fast-paced daily workflows. Traditional trading environments in West Sumatra are highly dynamic, requiring rapid product turnarounds and face-to-face transaction confidence (Arini et al., 2025). If an application is text-heavy, ambiguous, or lacks visual feedback, merchants suffer cognitive friction, leading to immediate platform abandonment (Novita & Hanifah, 2025). By embedding intuitive visual merchandising such as visual color codes for fresh vs. stale stocks, clear iconography for QRIS digital payments, and streamlined image upload pipelines the platform directly replicates the sensory trust of a physical market layout. Consequently, ease of use is unlocked, which directly encourages long-term continuous digital integration (Mandiri et al., 2024).

Practical and Managerial Implications

The practical implications of these findings are highly relevant for municipal policymakers and application developers working on municipal digitization in Padang. The results prove that top-down technological enforcement simply building a stable backend system and mandating its use is insufficient to modernize traditional markets. Municipal initiatives often experience low engagement because the software design aligns with modern corporate retail rather than informal, traditional realities (Ramadhan et al., 2025). Platform developers must prioritize empathetic, user-centric visual communication models. This includes implementing localized visual design languages, integrating intuitive iconographies that require zero textual reading, and deploying automated mobile imaging assets that optimize the presentation of fresh agricultural produce effortlessly. By unifying visual design ergonomics with efficient digital business models (Management), traditional markets can smoothly transition into robust, resilient *Smart Markets* without losing their distinctive socio-cultural identity.

CONCLUSION

This study delivers empirical confirmation that the structural integration of digital visual communication parameters is a foundational baseline for accelerating technology adoption within informal socio-economic ecosystems. The statistical estimations generated via PLS-SEM demonstrate that digital modernization within traditional retail domains cannot be achieved through a unidirectional focus on backend functional utility. Instead, the internalization of digital workflows among highly conventional, non-technical merchants is heavily governed by the aesthetic and ergonomic configurations of the front-end user interface. Specifically, Digital Visual Merchandising (DVM) serves as a critical cognitive gateway that directly shapes and elevates both the Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of digital platform frameworks. The empirical evidence established in the context of traditional markets in Padang clarifies a vital operational mechanism: when application layouts incorporate localized typographic hierarchies, intuitive spatial mapping, and high-quality simulated tactile photography, the psychological friction and immediate cognitive load experienced by merchants drop substantially. This structural alignment effectively bridges the deeply ingrained physical and cultural transaction habits of traditional vendors with the rigorous demands of cloud-based digital commerce. Consequently, ease of use acts as a powerful mediating conduit that transforms initial merchant resistance into active behavioral intent and long-term platform adoption. Ultimately, this research shifts the paradigm of market digitization from a purely technical enforcement into an empathetic, visually driven transformation.

Limitations and Future Research Directions

Despite its robust empirical contributions, several limitations within this study must be acknowledged to guide future scholarly inquiries. First, the geographical boundaries of this research were strictly confined to primary municipal traditional markets within Padang, West Sumatra, which may exhibit distinct cultural and operational habits unique to the Minangkabau trading ecosystem. Therefore, caution should be exercised when generalizing these specific behavioral outcomes to other ethnically diverse informal sectors. Second, this study relied on a quantitative cross-sectional design, capturing merchant perceptions at a single baseline period during the digital onboarding phase in 2026. Future academic investigations should deploy longitudinal approaches to observe how the relationship between interface aesthetics and platform adoption evolves as merchants transition from novice users to digitally mature operators. Additionally, integrating qualitative methodologies, such as thematic analysis via NVivo or eye-tracking visual experiments, could provide deeper, multi-dimensional insights into the exact sensory mechanisms that govern user-interface ergonomics for informal micro-vendors.

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