Research Article

CONSUMER ATTITUDES TOWARD UNMANNED CONVENIENCE STORES IN THAILAND: APPLYING THE YONISOMANASIKARA APPROACH

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Abstract

Background and Objectives: Unmanned convenience stores represent an emerging retail innovation that integrates artificial intelligence, the Internet of Things, and automated payment systems to deliver cashierless shopping experiences. Although these formats have expanded rapidly in technologically advanced economies, consumer acceptance remains uneven due to concerns related to trust, privacy, system reliability, and the absence of human interaction. Previous studies have predominantly examined these issues through functional and instrumental perspectives, often overlooking reflective, ethical, and culturally embedded dimensions of consumer decision-making. In particular, technology acceptance research grounded in the Technology Acceptance Model (TAM) has emphasized perceived usefulness and trust while paying comparatively limited attention to culturally informed reflective reasoning. In Thailand, unmanned convenience stores are still at an early stage of diffusion, and empirical research on consumer attitudes toward this retail format remains limited. Given Thailand's strong Buddhist cultural context, understanding technology acceptance through reflective and mindful evaluation is particularly relevant. Accordingly, this study pursued multiple interrelated objectives. First, it examined demographic and behavioral determinants of consumer attitudes toward unmanned convenience stores. Second, it analyzed perceived benefits (Assada) associated with unmanned retail systems. Third, it investigated perceived drawbacks (Adinava) and coping mechanisms (Nissarana) that influence consumer acceptance. Finally, it integrated the Yonisomanasikara reflective framework with established Technology Acceptance Model (TAM) constructs to assess its incremental explanatory power.

Methodology: A quantitative, cross-sectional survey was conducted with 396 consumers in Chonburi Province, Thailand, using a multi-stage sampling technique to capture urban, suburban, and tourism-related consumer segments. A structured questionnaire measured demographic characteristics, shopping behavior, TAM constructs (Perceived Usefulness, Ease of Use, Perceived Risk, Trust, and Attitude), and the three dimensions of Yonisomanasikara: Asada (Benefits), adinava (Drawbacks), and nissarana (Coping or Resolution). Hierarchical regression analysis was employed to compare a baseline TAM model with an extended integrative model incorporating reflective cognition.

Main Results: The results indicated generally positive consumer attitudes toward unmanned convenience stores. While perceived usefulness and trust significantly predicted attitudes in the baseline TAM model, hierarchical regression analysis revealed that the inclusion of Yonisomanasikara constructs significantly enhanced explanatory power. Most notably, nissarana emerged as the strongest predictor of consumer attitude, suggesting that acceptance was shaped not merely by recognizing benefits or minimizing risks, but by the ability to cognitively reconcile perceived drawbacks through reflective coping. Even when perceived risks and drawbacks were acknowledged, attitudes remained favorable when credible coping mechanisms were identified.

Involvement to Buddhadhamma: This study is positioned within Applied Buddhism. By empirically operationalizing Yonisomanasikara, a core Buddhist principle of wise reflection and analytical discernment, the research demonstrates how Buddhist cognitive training can inform contemporary technology acceptance behavior. The integration of Yonisomanasikara with the Technology Acceptance Model (TAM) positions Buddhist analytical reasoning as a reflective mechanism that shapes consumer evaluation beyond instrumental rationality. This applied approach illustrates the relevance of Buddhist principles in understanding modern digital retail systems and their implications for Buddhism and sustainable development.

Conclusions: The study concludes that reflective coping and resolution (Nissarana) constitute the most critical determinant of Thai consumers' attitudes toward unmanned convenience stores. Demographic characteristics exert comparatively limited influence, reinforcing the argument that acceptance is shaped more by reflective cognitive processing than by static personal attributes. Integrating Yonisomanasikara with TAM provides a culturally sensitive and ethically grounded framework that explains consumer acceptance as a process of mindful evaluation rather than uncritical adoption. The findings contribute to Buddhist-informed consumer research and offer guidance for designing unmanned retail systems that foster trust, transparency, and responsible engagement.

Keywords: Unmanned Convenience Stores, Consumer Attitudes, Technology Acceptance Model (TAM), Yonisomanasikara Approach, Trust

Introduction

The retail sector has undergone a profound transformation in the last decade as digital technologies, Artificial Intelligence (AI), and automation reshape consumer experiences. From an experiential perspective, retail environments are not merely transactional spaces but embodied and spatial settings in which consumers construct meaning through interaction with physical, technological, and social elements (García-Nieto et al., 2025); (Yakhlef, 2015). Among these innovations, unmanned convenience stores, characterized by the absence of in-store staff and the reliance on advanced technologies such as the Internet of Things (IoT), computer vision, and automated payment systems, have attracted global attention as a disruptive retail format (Park & Zhang, 2022); (Wang et al., 2022). Prominent examples include Amazon Go in the United States, BingoBox in China, and FamilyMart's automation strategy in Japan. These models are promoted as solutions to rising labor costs, consumer demand for frictionless shopping, and the growing diffusion of cashless transactions (Juan, 2025).

In parallel, data-driven retail analytics such as spatio-temporal clustering and sequential pattern mining have been increasingly applied to understand customer behavior and optimize retail operations in technology-enabled store environments (Chen et al., 2020). Globally, semi-automated unmanned convenience stores had a market worth approximately USD 61.8 million in 2019, representing a substantial share (≈ 91.6%) of unmanned convenience market types at that time (Denuwara et al., 2021). Additionally, empirical studies suggest strong consumer acceptance of unmanned convenience stores driven by trust, perceived usefulness, performance expectancy, and technology readiness (Ee et al., 2024); (Szabó-Szentgróti et al., 2023a); (Wang et al., 2022); (Wang et al., 2023).

Despite such potential, adoption has been uneven across regions. While Asian markets such as Taiwan and China report relatively favorable consumer acceptance, studies in Europe demonstrate stronger resistance, reflecting cultural and contextual variations in technology adoption (Szabó-Szentgróti et al., 2023a). Key concerns include technological reliability, the absence of human interaction, and risks related to data privacy and payment security (Pantano et al., 2022); (Sari et al., 2023); (Wang et al., 2021). A recent choice experiment study found that though consumers generally prefer unmanned stores, their preference declines as stores adopt more advanced technology attributes, suggesting that increased automation may amplify concerns over trust, reliability, and privacy (Nam et al., 2025). These findings highlight the complex interplay of perceived usefulness, ease of use, trust, and risk in shaping consumer attitudes toward unmanned retail formats (de Luca & Pegan, 2011). Prior empirical research in online retail contexts also demonstrates that financial, product, and security risks do not directly suppress purchase intention when trust functions as a mediating mechanism, underscoring the central role of trust in risk-laden digital consumption environments (Dunggio & Rasyid, 2024).

However, most existing studies conceptualize consumer acceptance primarily as a functional and instrumental evaluation of technology, emphasizing efficiency, convenience, and performance-related outcomes. Such approaches tend to underrepresent the reflective and ethical dimensions of consumer decision-making, particularly in contexts where advanced technologies directly affect personal data, privacy, and social values (Bombaerts et al., 2023). In unmanned convenience stores, consumers are not merely evaluating whether the technology is useful or easy to use but are also required to reflect on potential negative consequences, such as surveillance, data misuse, and the erosion of human interaction in everyday consumption. This limitation becomes particularly salient in digitally mediated retail environments where issues of data governance, labor displacement, and regulatory preparedness intersect with everyday consumption practices. Conventional TAM-based models, while effective in explaining utilitarian evaluations, provide limited insight into how consumers reconcile awareness of such socio-ethical implications with continued adoption (Dastorani & Khoshneshin, 2017); (Hsu & Lin, 2022); (Saleh et al., 2020). This theoretical insufficiency highlights the need for a reflective and culturally grounded analytical framework capable of explaining how awareness of drawbacks is transformed into reasoned acceptance.

In Thailand, unmanned convenience stores are a nascent phenomenon. Lotus's Pick & Go by True Digital, launched in Bangkok in mid-2023, introduced Thai consumers to cashierless, fully automated retail via over 400 product items, QR code entry, and automated charging through TrueMoney Wallet. Early accounts praise the speed and convenience of the experience, although there are caveats noted in media reports regarding concerns over technological reliability and data privacy. Given Thailand's status as a dynamic retail market in Southeast Asia, high smartphone penetration, rapid urbanization, and growing demand for 24-hour convenience, understanding consumer acceptance of this retail format is both timely and strategically significant (Szabó-Szentgróti et al., 2023b). Moreover, as unmanned retail expands within Thailand's digital economy, policy considerations relating to data protection standards, employment restructuring, and institutional oversight become increasingly prominent, reinforcing the importance of examining acceptance as a socially embedded and ethically informed evaluative process rather than a purely individual preference (Diana et al., 2025).

To address these complexities, this study incorporates the Yonisomanasikara approach, a Buddhist analytical framework that emphasizes systematic reflection through three interrelated dimensions: Recognition of benefits (Assada), acknowledgment of drawbacks or dangers (Adinava), and discernment of appropriate coping strategies or resolutions (Nissarana). In Buddhist epistemology, Yonisomanasikara represents a form of wise and mindful consideration that enables individuals to evaluate phenomena beyond immediate gratification, encouraging balanced judgment grounded in ethical awareness.

In the context of unmanned convenience stores, such reflective cognition becomes particularly relevant, as consumers are required to evaluate not only functional attributes of the technology but also broader concerns related to privacy, trust, automation, and social implications. By structuring evaluation into the interconnected processes of assada, adinava, and nissarana, Yonisomanasikara provides a systematic cognitive pathway through which consumers reinterpret perceived risks and arrive at reasoned acceptance rather than impulsive rejection or uncritical adoption.

While prior studies have relied heavily on the Technology Acceptance Model (TAM) and its extensions to explain consumer attitudes toward unmanned retail (Park & Zhang, 2022); (Wang et al., 2022), Yonisomanasikara offers a culturally grounded framework that captures reflective processes often omitted from conventional technology adoption models. Importantly, rather than replacing TAM, the Yonisomanasikara approach complements existing constructs by elucidating how consumers cognitively and ethically assess both positive and negative aspects of technology before forming attitudes and intentions.

Whereas TAM primarily emphasizes instrumental evaluations such as perceived usefulness and ease of use, the Yonisomanasikara framework introduces a higher-order reflective mechanism that explains how individuals transform awareness of drawbacks (Adinava) into adaptive coping and resolution (Nissarana). This integrative perspective therefore extends technology acceptance theory by highlighting reflective cognition as a regulatory process that shapes balanced consumer attitudes in technologically mediated retail environments.

Although existing studies have provided valuable insights into automated retail adoption, limited research has examined unmanned convenience stores in Thailand, where the format is still at an early stage of diffusion. Moreover, previous research rarely operationalizes Buddhist cognitive principles as measurable constructs within empirical models. This study addresses these gaps by quantitatively operationalizing the three dimensions of Yonisomanasikara and integrating them with TAM-derived constructs, thereby offering a more holistic and culturally sensitive explanation of consumer attitudes toward unmanned convenience stores. Given that adoption in Thailand remains concentrated among digitally literate, economically active youth, including working students who combine formal education with part-time or full-time employment, the present focus is theoretically aligned with examining early-stage diffusion dynamics rather than making broad population-level generalizations. By combining instrumental evaluations with reflective judgment, the proposed framework advances theoretical discussions on technology acceptance while generating practical implications for retailers, policymakers, and technology developers seeking to implement unmanned retail formats in diverse sociocultural contexts.

Objectives

This study pursued multiple interrelated objectives. First, it examined demographic and behavioral determinants of consumer attitudes toward unmanned convenience stores. Second, it analyzed perceived benefits (Assada) associated with unmanned retail systems. Third, it investigated perceived drawbacks (Adinava) and coping mechanisms (Nissarana) that influence consumer acceptance. Finally, it integrated the Yonisomanasikara reflective framework with established Technology Acceptance Model (TAM) constructs to assess its incremental explanatory power.

Methodology

This study employed a quantitative, cross-sectional survey design to investigate consumer attitudes toward unmanned convenience stores in Thailand. The research framework was grounded in the Technology Acceptance Model (TAM). It was extended through the Yonisomanasikara approach, which was operationalized as measurable cognitive constructs. These constructs reflected consumers' evaluation of benefits (Assada), drawbacks (Adinava), and coping mechanisms (Nissarana). This design was chosen to provide both empirical measurement of consumer attitudes and a culturally grounded explanation of how consumers cognitively and ethically assess automated retail technologies.

Population and Sample

The target population for this study comprised consumers residing in or visiting Chonburi Province, Thailand, a regional hub of economic activity and tourism. A multi-stage sampling procedure was adopted to ensure both diversity and representativeness of respondents. In the first stage, Chonburi was selected as the focal province due to its heterogeneous consumer base. In the second stage, the province was stratified into three zones: Metropolitan centers (e.g., Chonburi City, Pattaya), suburban districts (e.g., Si Racha, Bang Lamung), and tourism-oriented areas (e.g., Bang Saen and Coastal Destinations). In the third stage, clusters of high consumer traffic were

identified within each zone, including shopping malls, residential neighborhoods, and transport or tourism hubs. In the fourth stage, respondents were recruited through systematic and convenience sampling within these clusters, ensuring proportional representation across zones. The final stage yielded a total sample of 396 valid responses, distributed as approximately 40% urban, 35% suburban, and 25% tourism-based consumers. This multi-stage procedure ensured that the sample captured demographic and behavioral variation within the province. As a result, the robustness of the analysis was enhanced.

The sample was predominantly composed of working-age students who reported concurrent employment alongside formal education. This segment reflects an economically active and digitally engaged cohort rather than a purely dependent student population. Considering that unmanned convenience stores in Thailand remain at an early stage of diffusion, concentrating on this technologically adaptive group is analytically appropriate for examining initial adoption dynamics. Accordingly, the findings should be interpreted within this stage-specific and segment-bound context rather than as population-level generalizations.

Research Instruments

A structured questionnaire was developed based on prior research in technology acceptance and unmanned retail. It comprised six sections: 1) Demographics (Gender, Age, Education, Occupation, Income), 2) Consumer behavior (Frequency of Visits, Spending Per Visit), 3) Perceived benefits (Assada), 4) Perceived drawbacks (Adinava), 5) Coping mechanisms (Nissarana), and 6) TAM-related, including Perceived Usefulness (labeled in this Study as Advantage / Usefulness), Ease of Use, Perceived Risk, Trust, and Attitude.

The Yonisomanasikara constructs were operationalized as multi-item scales reflecting systematic reflection in consumer decision-making. Assada captured perceived advantages of unmanned convenience stores, adinava represented perceived risks and negative consequences, and nissarana measured perceived coping strategies or resolutions that enable consumers to engage with the technology despite potential concerns.

Within the adinava dimension, privacy concerns were conceptualized as consumers' recognition of potential vulnerabilities. These vulnerabilities were associated with automated data collection and digital payment systems. In this framework, privacy reflects the acknowledgment of possible harm as part of reflective evaluation, rather than a generalized assessment of technological risk. This distinction allows the study to analytically separate the recognition of drawbacks (Adinava) from broader evaluative constructs such as perceived risk and trust within the TAM framework. All items were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Content validity was confirmed through expert review, and reliability testing showed Cronbach's alpha values exceeding 0.70 for all constructs, indicating satisfactory internal consistency. The overall structure of the survey instrument, including its key sections and measured constructs, was summarized in Table 1.

Construct validity was assessed using Exploratory Factor Analysis (EFA). The Kaiser–Meyer–Olkin (KMO) measure was 0.962, indicating excellent sampling adequacy. Bartlett's test of sphericity was significant ($\chi^2 = 10388.43$, $p < .001$), confirming the suitability of the data for factor analysis. All items loaded strongly on the primary factor, with factor loadings ranging from 0.67 to 0.84, supporting convergent validity and structural coherence of the measurement model.

Table 1 Structure of the Survey Instrument

Section	Description
Demographics	Gender, Age, Education, Occupation, Income
Consumer Behavior	Frequency of visits, Spending per visit
Perceived Benefits (Assada)	Items measuring speed, convenience, technological innovation, 24-hour access
Perceived Drawbacks (Adinava)	Items measuring concerns about reliability, job displacement, privacy, lack of human interaction
Coping Mechanisms (Nissarana)	Items measuring digital literacy, coping strategies, trust in data security, support systems
TAM Constructs	Items measuring perceived usefulness, ease of use, perceived risk, trust, and overall attitude

Note: All items were measured on a five-point Likert scale

To ensure the internal consistency of the measurement scales, reliability analysis was conducted for all multi-item constructs. Cronbach's alpha coefficients were calculated to assess the consistency of responses within each construct. The reliability coefficients for all constructs were presented in Table 2.

Table 2 Reliability Results of Constructs

Construct	Cronbach's Alpha
Advantage / Usefulness	0.81
Ease of Use	0.83
Perceived Risk	0.79
Trust	0.88
Attitude	0.85

Note: All constructs showed acceptable reliability ($\alpha > 0.70$).

Data Collection

The survey was conducted in Chonburi Province between January 2024 and June 2025. A multi-stage sampling procedure was applied, beginning with stratification of urban, suburban, and tourism zones, followed by cluster selection of shopping malls, residential areas, and transport hubs. Within each cluster, respondents were approached through systematic and convenience methods. A total of 396 valid questionnaires were obtained. Participation was

voluntary and anonymous, with all respondents providing informed consent. Ethical guidelines regarding confidentiality and the right to withdraw were strictly observed.

Data Analysis

Data were analyzed using SPSS Statistics version 25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize demographic characteristics, consumer behavior, and the three dimensions of Yonisomanasikara**.** Pearson correlation analysis was conducted to examine associations among the main constructs.

Multiple regression analysis was applied in two stages. First, a baseline regression model tested the influence of TAM-related variables, advantage/usefulness, ease of use, perceived risk, and trust, on consumer attitudes toward unmanned convenience stores. The model demonstrated strong explanatory power ($R^2 = 0.514$, $F(4,391) = 103.51$, $p < 0.001$), with trust and advantage emerging as significant predictors, while ease of use and perceived risk showed no significant effects.

In the second stage, the Yonisomanasikara constructs (Assada, Adinava, and Nissarana) were incorporated into the regression model to examine their incremental explanatory power beyond traditional TAM variables. This hierarchical regression approach enabled assessment of whether reflective evaluation grounded in Buddhist cognitive principles significantly enhanced the prediction of consumer attitudes toward unmanned convenience stores.

The conceptual framework illustrated the integration of TAM constructs with the Yonisomanasikara dimensions, positioning assada, adinava, and nissarana as reflective cognitive factors that complement functional evaluations of technology acceptance, as illustrated in Figure 1.

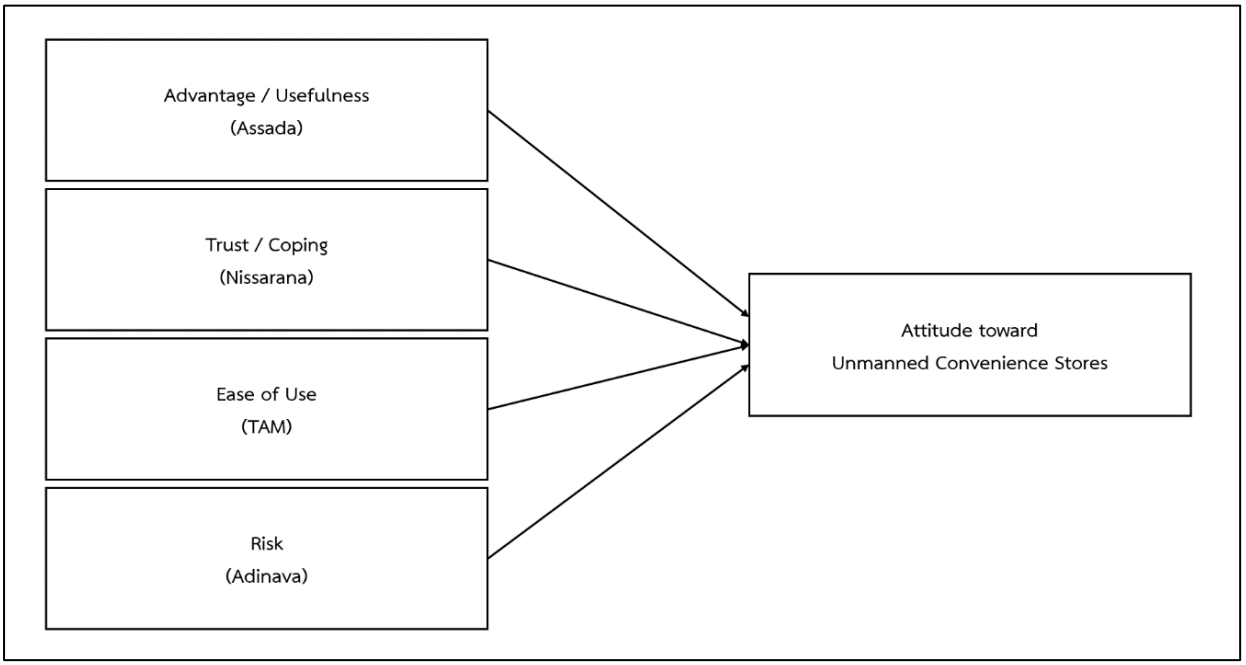

Figure 1 Conceptual Framework

Results and Discussion

Descriptive Results of Respondents

A total of 396 valid responses were obtained from consumers residing in or visiting Chonburi Province who had used convenience stores within the past year. The sample was predominantly female (71.7%), with males accounting for 28.3%. Most respondents were under 30 years of age (82.3%), followed by those aged 30–39 (16.2%), while 1.5% were aged 40 years and above. In terms of education, the majority held a bachelor's degree (75.8%), while 23.0% had completed secondary education, and 1.2% reported postgraduate qualifications. Almost half of the respondents reported a monthly income below THB 15,000 (47.5%), and 39.1% earned between THB 15,001 - 30,000, with the remaining respondents reporting incomes above THB 30,000. Students constituted the largest occupational group (98.5%), reflecting the youthful and digitally familiar profile of the sample. It is important to note that many respondents classified as students were simultaneously engaged in part-time or full-time employment, indicating that this category reflects educational status rather than economic inactivity.

Regarding shopping behavior, convenience stores played a central role in daily consumption. Approximately 42.7% of respondents visited convenience stores two to three times per week, and 26.5% reported daily visits. Most respondents (73.2%) spent between THB 51 and 100 per visit, indicating frequent, low-value transactions characteristic of routine convenience shopping.

With respect to Objective 1, and consistent with the four research objectives guiding this study, the results indicated that demographic and behavioral characteristics primarily described the profile of current users but exerted limited explanatory influence on consumer attitudes when compared with cognitive evaluation constructs. This suggested that acceptance was shaped less by who consumers were and more by how they interpreted benefits, drawbacks, and coping possibilities.

Descriptive Statistics of TAM and Yonisomanasikara Constructs

To provide an overview of consumer perceptions, descriptive statistics were calculated for all major constructs, including the Technology Acceptance Model (TAM) variables and the three dimensions of Yonisomanasikara.

Descriptive statistics, including means and standard deviations of the TAM and Yonisomanasikara constructs, were presented in Table 3.

Table 3 Descriptive Statistics of Key Constructs

Construct	Mean	SD
Attitude	4.09	0.79
Advantage / Usefulness	4.22	0.64
Ease of Use	4.31	0.65
Perceived Risk	4.11	0.73
Trust	4.17	0.65
Assada (Perceived Benefits)	4.24	0.62

Table 3 Descriptive Statistics of Key Constructs (Continued)

Construct	Mean	SD
Adinava (Perceived Drawbacks)	4.11	0.73
Nissarana (Coping / Resolution)	4.17	0.65

The results indicated that respondents generally held positive evaluations of unmanned convenience stores. Attitude toward using and recommending unmanned convenience stores was high (M = 4.09), suggesting strong openness to this retail format (de Luca & Pegan, 2011). Among TAM-related constructs, perceived ease of use received the highest mean score (M = 4.31), followed by perceived advantage/usefulness (M = 4.22) and trust (M = 4.17). Although perceived risk was also rated relatively high (M = 4.11), this did not necessarily translate into negative attitudes.

The standard deviation values, ranging from 0.62 to 0.79 across constructs, indicated relatively low to moderate variability in responses, suggesting a considerable degree of consensus among participants. In particular, the lower dispersion observed for perceived benefits (Assada) and ease of use reflects consistent agreement regarding the functional advantages of unmanned convenience stores.

Importantly, the Yonisomanasikara dimensions exhibited a balanced pattern. Assada (Perceived Benefits) recorded the highest mean (M = 4.24), indicating strong recognition of convenience, efficiency, and technological advantages. Addressing Objective 2, this finding indicated that perceived benefits played a substantial role in shaping favorable evaluations of unmanned retail systems. Adinava (Perceived Drawbacks) was also acknowledged at a moderate-to-high level (M = 4.11), reflecting awareness of privacy, security, and reliability concerns. In relation to Objective 3, the recognition of drawbacks suggests that consumers were not uncritical adopters, but rather demonstrated awareness of potential constraints. However, Nissarana (Coping or Resolution) demonstrated a high mean score (M = 4.17), suggesting that respondents identified viable strategies and justifications that enabled them to engage with unmanned convenience stores despite perceived risks. Addressing Objective 4, the prominence of nissarana suggests that coping mechanisms play a central role in shaping consumer acceptance of unmanned convenience stores.

While adinava showed slightly higher variability compared to assada, this pattern implies that perceptions of potential drawbacks were more diverse, even though overall evaluations remained favorable.

Reliability Analysis of Constructs

The reliability coefficients for all TAM and Yonisomanasikara constructs were summarized in Table 4. To ensure internal consistency of the measurement scales, Cronbach's alpha coefficients were calculated for all composite constructs.

Table 4 Reliability Results of TAM and Yonisomanasikara Constructs

Construct	Cronbach's Alpha
Advantage / Usefulness	0.81
Ease of Use	0.83

Table 4 Reliability Results of TAM and Yonisomanasikara Constructs (Continued)

Construct	Cronbach's Alpha
Perceived Risk	0.79
Trust	0.88
Attitude	0.85
Assada	0.86
Adinava	0.82
Nissarana	0.88

All constructs exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency. The reliability coefficients for the Yonisomanasikara dimensions were particularly strong, supporting their use as empirically measurable cognitive constructs in subsequent analyses.

Although the Perceived Risk construct demonstrated a slightly lower coefficient (α = 0.79) relative to other constructs, it remains well within the acceptable range for social science research.

Correlation Analysis

The correlations among the main study variables were reported in Table 5. Pearson's correlation analysis was conducted to examine relationships among the major constructs.

Table 5 Correlation Matrix of Key Constructs

Variable	Attitude	Advantage	Ease	Risk	Trust	Assada	Adinava	Nissarana
Attitude	1.000							
Advantage	0.676***	1.000						
Ease	0.608***	0.779***	1.000					
Risk	0.578***	0.700***	0.663***	1.000				
Trust	0.750***	0.813***	0.744***	0.741***	1.000			
Assada	0.702*	0.846*	0.781*	0.668*	0.825*	1.000		
Adinava	0.581*	0.693*	0.661*	0.902*	0.734*	0.706*	1.000	
Nissarana	0.769*	0.781*	0.706*	0.702*	0.842*	0.812*	0.748*	1.000

Note: ***p < 0.001.

The results showed strong and significant correlations among all constructs. Attitude was most strongly correlated with trust (r = 0.750) and nissarana (r = 0.769), followed by assada (r = 0.702). Although perceived risk and adinava were positively correlated with attitude, these relationships were weaker than those involving trust and coping-related evaluations, suggesting that awareness of drawbacks does not necessarily suppress positive attitudes.

A very high correlation was observed between perceived risk and adinava (r = 0.902), reflecting their close conceptual association in capturing negative evaluations of unmanned retail technologies. Although strongly related, the two constructs represent distinct analytical dimensions within the integrated framework.

In addition, the strong association between nissarana and attitude (r = 0.769) underscores the importance of reflective coping mechanisms in shaping favorable consumer evaluations.

Regression Analysis

A multiple regression analysis was first conducted using TAM-related variables as predictors of consumer attitude. The results of the baseline multiple regression analysis based on TAM constructs are presented in Table 6.

Table 6 Multiple Regression Analysis: Baseline TAM Model

Predictor	β	t	p
Advantage / Usefulness	0.354	6.21	< 0.001
Ease of Use	0.090	1.51	0.133
Perceived Risk	0.017	0.29	0.776
Trust	0.316	5.62	< 0.001

Model Summary: R^2 = 0.514, Adjusted R^2 = 0.509, F(4,391) = 103.51, p < 0.001 All VIF values < 5

The baseline model explained 51.4% of the variance in attitude. Perceived advantage/usefulness and trust were significant predictors, whereas ease of use and perceived risk were not statistically significant.

Among the significant predictors, perceived advantage/usefulness (β = 0.354) exerted a slightly stronger effect than trust (β = 0.316), indicating that functional evaluations of utility played the most influential role in shaping attitudes within the baseline TAM model.

Although ease of use and perceived risk were significantly correlated with attitude in the bivariate analysis, their effects became non-significant in the multivariate model. This pattern diverges from several international studies in which perceived risk retained a direct negative influence on adoption intentions (Wang et al., 2022); (Nam et al., 2025).

Instead, the present findings align more closely with research emphasizing the buffering role of trust in digital consumption contexts (Dunggio & Rasyid, 2024). This suggests that within the Thai context, risk awareness does not necessarily translate into resistance when reflective coping mechanisms are present.

The findings further suggest the presence of shared variance among TAM constructs, particularly with advantage and trust, which may account for the diminished unique contribution of these variables when entered simultaneously into the regression model.

Hierarchical Regression: Incremental Effect of Yonisomanasikara

The results of the hierarchical regression analysis examining the incremental contribution of the Yonisomanasikara dimensions are presented in Table 7. To assess whether Yonisomanasikara contributed explanatory power beyond TAM, a hierarchical regression was performed. In Step 1, TAM-related variables were entered. In Step 2, the three Yonisomanasikara dimensions were added to examine incremental variance explained.

Table 7 Hierarchical Regression Analysis

Predictor	β (Final Model)	t	p
Advantage / Usefulness	0.155	2.44	0.015
Ease of Use	0.048	0.81	0.419
Perceived Risk	0.012	0.21	0.833
Trust	0.091	1.42	0.156
Assada	0.082	1.31	0.190
Adinava	-0.041	-0.88	0.381
Nissarana	0.553	9.21	< 0.001

Model Summary:

- Step 1 (TAM): $R^2 = 0.514$
- Step 2 (TAM + Yonisomanasikara): $R^2 = 0.586$
- $\Delta R^2 = 0.072$, $\Delta F(3,388) = 24.67$, $p < 0.001$

The inclusion of Yonisomanasikara significantly improved the model's explanatory power. Among the three dimensions, nissarana emerged as the strongest predictor of attitude, while assada and adinava were not significant once coping-related evaluations were considered.

The incremental increase in explanatory power ($\Delta R^2 = 0.072$) indicated that the Yonisomanasikara framework contributed meaningful additional insight beyond traditional TAM variables. Notably, the prominence of nissarana indicated that consumer acceptance was not determined solely by the recognition of benefits or drawbacks. Instead, acceptance depended on consumers' ability to reconcile these evaluations through reflective coping processes.

Finally, addressing Objective 4, the integration of Yonisomanasikara with TAM significantly enhanced explanatory power and demonstrated the added value of Buddhist cognitive principles in technology acceptance research.

Discussion

To strengthen the alignment between the stated objectives and the empirical findings, this discussion is organized according to the four research objectives, ensuring that each aim is systematically addressed and theoretically interpreted. The findings provide strong empirical support for integrating Buddhist cognitive principles into technology adoption research. While traditional TAM constructs, particularly perceived usefulness and trust, explained a substantial proportion of variance in consumer attitudes, the addition of Yonisomanasikara significantly enhanced explanatory power. This result is consistent with foundational TAM research emphasizing perceived usefulness as a primary determinant of acceptance (Davis, 1989), as well as subsequent refinements highlighting the role of contextual and structural factors in technology adoption (Malatji et al., 2020); (Szabó-Szentgróti et al., 2023a).

Most notably, nissarana (Coping and Resolution) emerged as the dominant predictor of consumer attitude. This suggests that Thai consumers do not simply adopt unmanned convenience stores because they perceive benefits or ignore risks; Rather, acceptance is driven by their ability

to articulate viable resolutions that allow them to manage perceived drawbacks (Ajzen, 2008); (Nam et al., 2025); (Zirena-Bejarano & Zirena, 2024). In line with Yonisomanasikara logic, respondents appeared capable of acknowledging adinava (Drawbacks) while maintaining favorable attitudes when nissarana (Resolutions) was strong. This finding aligns with prior research indicating that trust mechanisms and perceived control can buffer the negative influence of perceived risk in digital consumption contexts (Hong et al., 2011); (Park & Yoon, 2022); (Dunggio & Rasyid, 2024). Importantly, the magnitude of nissarana's standardized coefficient (β = 0.553) substantially exceeded that of traditional TAM predictors in the final model. This indicates that reflective coping mechanisms outweighed instrumental evaluations such as usefulness and trust in shaping attitudes.

From a theoretical perspective, these finding advances technology acceptance research by introducing reflective reconciliation as a higher-order cognitive regulatory process. Whereas TAM conceptualizes adoption primarily through functional assessments, the present study demonstrates that consumers may accept technology even in the presence of acknowledged risks when credible coping pathways are identified. Such reflective processing is consistent with prior empirical work on Yonisomanasikara as a structured cognitive training process that enhances balanced and intelligent consumption behavior (Satier et al., 2017), as well as broader Buddhist-informed accounts of mindful and ethically grounded awareness (Shonin et al., 2015); (Grossman, 2015).

The non-significance of perceived risk and adinava in the final model does not imply that risks are unimportant, but rather that their influence is mediated by coping-related evaluations. For a young, digitally literate population, concerns about privacy or system reliability may be cognitively recognized yet rendered less decisive when respondents trust institutional arrangements and perceive sufficient readiness to engage with technology (Seo & Lee, 2021).

Overall, this study advances the literature by empirically demonstrating how Yonisomanasikara complements TAM, offering a culturally grounded explanation of reflective consumer decision-making in automated retail contexts. From a practical perspective, retailers should focus not only on enhancing functional benefits but also on strengthening consumers' perceived resolution pathways through trust-building mechanisms, transparent communication, and supportive service systems (Denuwara et al., 2021). Beyond managerial implications, these findings highlight the importance of visible regulatory frameworks, transparent data governance, and institutional accountability in strengthening perceived coping pathways. Ethical and legal clarity may therefore function as structural supports for nissarana, reinforcing socially sustainable technology adoption.

Originality and Body of Knowledge

This study contributes original and contextually grounded knowledge to research on unmanned convenience stores by empirically integrating the Technology Acceptance Model (TAM) with the Yonisomanasikara approach. Although unmanned convenience stores have been widely examined as a disruptive retail innovation driven by artificial intelligence, the Internet of Things, and automated payment systems, most existing studies emphasize functional and instrumental determinants of adoption. In Thailand, where cashierless retail formats such as

Lotus's Pick & Go have only recently been introduced, consumer acceptance remains closely tied to cultural norms, ethical concerns, and reflective judgment. The originality of this research lies in demonstrating how technology adoption can be explained through both functional evaluation and Buddhist analytical reflection.

A key body of knowledge generated by this study is the recognition that unmanned convenience stores represent a socio-cultural transformation of retail rather than merely a technological upgrade. Unmanned retail simultaneously presents efficiency gains and socio-cultural tensions related to trust, inclusion, and reduced human interaction. Empirical evidence from online shopping contexts further indicates that consumer adoption is constrained by multiple factors, including perceived risk, trust deficits, and system-related concerns, which collectively shape resistance to digital purchasing environments. Consistent with this literature, the present findings show that Thai consumers simultaneously acknowledge benefits and drawbacks. This supports arguments that adoption decisions should be evaluated not only in terms of convenience and cost efficiency, but also in terms of inclusivity and social well-being, particularly for groups with limited digital literacy or economic vulnerability.

This pattern extends prior TAM-based research in two important ways. First, while many TAM extensions incorporate perceived risk and trust as parallel predictors of attitude, the present findings suggest a more dynamic mechanism in which risk awareness does not directly suppress adoption but is cognitively processed through reflective evaluation. In contrast to models that treat risk and trust as competing forces, the dominance of nissarana implies that consumers actively reconcile perceived uncertainty through resolution-oriented reasoning rather than simply weighing positive and negative attributes.

Second, from the perspective of risk–trust literature, prior studies often emphasize institutional trust as a buffer against perceived risk. The present findings refine this view by suggesting that trust alone is insufficient; Instead, what appears most decisive is the consumer's perceived ability to formulate workable coping strategies. This shifts the explanatory focus from external assurances to internal cognitive regulation.

More broadly, the results contribute to culturally grounded decision-making theories by demonstrating how reflective cognition, conceptualized through Yonisomanasikara, functions as a mediating interpretive process between evaluation and behavioral intention. Unlike purely utilitarian models, this framework accounts for how individuals consciously integrate benefits, drawbacks, and resolutions within a culturally embedded logic of balanced judgment.

The study further contributes by clarifying the role of attitude as the central outcome variable in unmanned retail adoption. Attitude is widely understood as a multidimensional construct that shapes both adoption and recommendation behavior. Attitudes toward unmanned retail are shaped not only by functional evaluation but also by broader socio-contextual considerations. This research demonstrates that attitudes toward unmanned convenience stores emerge from a combination of functional judgments and reflective reasoning, offering a more comprehensive explanation of consumer acceptance.

From a theoretical perspective, this study advances TAM-based research by addressing limitations related to cultural and ethical sensitivity. TAM has consistently shown that perceived usefulness and ease of use predict attitudes toward technology adoption, and extensions of TAM emphasize trust and perceived benefits as key enablers. However, TAM has been criticized for insufficient attention to contextual and cultural factors. By integrating trust, perceived risk, and Yonisomanasikara into a unified framework, this study responds directly to these critiques.

An important empirical contribution concerns the relationship between perceived risk and trust. Perceived risk is often treated as a barrier to technology adoption; However, the present findings indicate that risk does not directly undermine attitudes when reflective coping mechanisms are present. The findings indicate that trust can mitigate perceived risk and facilitate acceptance, particularly when consumers perceive credible ways to manage and resolve concerns. Evidence from online commerce further confirms that trust mediates the effects of financial and security risks on consumer intention, even in high-risk digital purchasing contexts. The present study extends this knowledge by showing that acceptance is further strengthened when consumers perceive credible ways to manage and resolve concerns.

The most distinctive contribution of this research, and its strongest alignment with the Journal of Buddhist Anthropology, is the empirical operationalization of the Yonisomanasikara approach. Yonisomanasikara conceptualizes reflective evaluation through assada (Recognition of Benefits), adinava (Acknowledgment of Drawbacks), and nissarana (Discernment of Coping Strategies). While previous studies discuss Buddhist ethics and mindfulness conceptually, this study demonstrates that Buddhist analytical reflection can be translated into measurable constructs. The findings reveal that nissarana plays a decisive role in shaping consumer attitudes, indicating that acceptance arises not from denying drawbacks, but from identifying workable resolutions that enable mindful engagement with technology.

More precisely, acceptance appears to emerge through a reflective process in which perceived drawbacks are cognitively acknowledged and subsequently reframed through resolution-oriented reasoning. This suggests that consumers do not passively tolerate technological risks; Rather, they actively construct justifications that allow balanced and informed engagement.

Taken together, the body of knowledge produced by this study can be conceptualized as a TAM-Yonisomanasikara Reflective Acceptance Model.

The proposed model consists of two analytically distinct yet interconnected layers. The first layer reflects traditional TAM constructs,perceived usefulness, ease of use, perceived risk, and trust, which serve as instrumental evaluative predictors of consumer attitude. These constructs operate through functional assessment of efficiency, utility, and system reliability. The second layer introduces Yonisomanasikara as a reflective cognitive mechanism structured through assada (Recognition of Benefits), adinava (Acknowledgment of Drawbacks), and nissarana (Discernment of Coping or Resolution Pathways).

Acceptance emerges when perceived benefits and trust are balanced against acknowledged drawbacks and supported by credible coping mechanisms, consistent with Buddhist teachings emphasizing discernment, moderation, and well-being.

Directionally, the empirical results indicate that while TAM variables explain substantial baseline variance in consumer attitude, nissarana exerts the strongest standardized effect in the integrated model. This suggests that reflective coping functions as a higher-order regulatory construct that transforms awareness of risk into constructive acceptance rather than simple risk tolerance.

Unlike prior TAM extensions that incorporate trust or perceived risk as parallel predictors, the present model specifies reflective reconciliation as a distinct explanatory pathway. In doing so, it advances technology acceptance theory beyond additive variable inclusion and instead conceptualizes adoption as a layered cognitive process integrating instrumental evaluation with ethical reflection.

Although grounded in Buddhist analytical principles, the reflective acceptance mechanism identified in this study is theoretically transferable beyond the Thai context. The model contributes to international technology adoption literature by offering a generalizable explanation of how individuals cognitively process automation-related concerns, data privacy issues, and technological uncertainty in emerging digital retail environments.

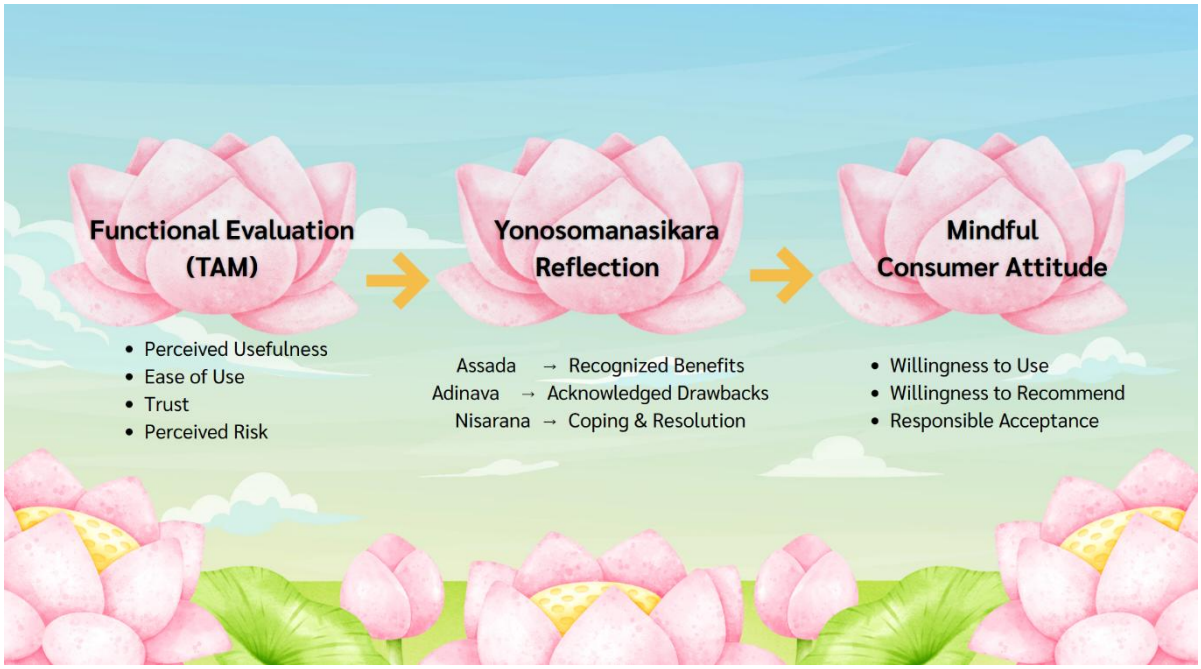

Figure 2 The TAM-Yonisomanasikara Reflective Acceptance Model

The integrative TAM-Yonisomanasikara Reflective Acceptance Model derived from the findings is illustrated in Figure 2. The model specifies a layered structure in which instrumental TAM constructs provide the baseline evaluative foundation, while Yonisomanasikara functions as a reflective regulatory mechanism that shapes how benefits and risks are cognitively reconciled. In contrast to conventional TAM extensions that incorporate additional predictors in parallel form,

the present model conceptualizes reflective coping (Nissarana) as a theoretically central construct that exerts a dominant directional influence on attitude formation.

In conclusion, the originality of this research lies in producing an integrative model that connects modern technology acceptance theory with Buddhist analytical reflection to explain consumer attitudes toward unmanned convenience stores.

More specifically, the model advances technology acceptance theory by demonstrating that adoption in culturally embedded contexts is not solely the result of perceived usefulness or trust, but of a structured reflective process in which acknowledged drawbacks are transformed into acceptable outcomes through resolution-oriented reasoning.

By combining TAM constructs with the Yonisomanasikara framework, the study offers culturally sensitive and ethically grounded knowledge that supports the sustainable and responsible development of automated retail in Thailand.

Importantly, although empirically grounded in the Thai context, the reflective acceptance mechanism proposed here contributes to broader international discussions on technology adoption by offering a transferable conceptual lens for understanding how individuals process ethical, privacy, and automation-related concerns in digitally mediated environments.

Conclusions and Recommendations

This study concludes that consumer attitudes toward unmanned convenience stores in Thailand are shaped not merely by functional evaluations of technology, but more fundamentally by reflective discernment consistent with the principle of Yonisomanasikara. Although consumers recognize the benefits of unmanned convenience stores in terms of convenience, efficiency, and innovation (Assada), they are simultaneously aware of potential drawbacks related to trust, privacy, and the absence of human interaction (Adinava). The findings demonstrate that positive attitudes emerge most strongly when consumers perceive clear and credible coping pathways (Nissarana), enabling them to engage with automated retail in a mindful, confident, and responsible manner. This finding extends prior TAM-based studies by demonstrating that acceptance is not solely determined by perceived usefulness, ease of use, or trust, but by a reflective reconciliation process through which acknowledged risks are cognitively transformed into manageable and acceptable conditions for engagement. Importantly, while demographic and usage-related variables were examined, their influence on consumer attitudes was comparatively limited, indicating that acceptance is shaped less by who consumers are in terms of age, gender, or income, and more by how they cognitively process perceived benefits, drawbacks, and coping possibilities. This suggests that acceptance of unmanned convenience stores does not arise from ignoring risks, but from thoughtful consideration and balanced judgment, reflecting Buddhist teachings that emphasize wisdom, moderation, and right understanding rather than blind adoption of novelty. From a policy perspective, relevant authorities should support the development of unmanned retail through ethical governance, data protection standards, and initiatives that enhance digital literacy, ensuring that technological progress does not marginalize vulnerable groups. Strengthening

transparent data governance frameworks and visible regulatory safeguards may directly enhance consumers' perceived coping capacity and reinforce reflective acceptance. From a practitioner perspective, retailers should move beyond promoting speed and automation alone, and instead design systems that visibly foster trust, transparency, and consumer readiness, thereby strengthening nissarana as the foundation of acceptance. Nevertheless, the predominantly young, working-age student sample limits the generalizability of the findings, and the results should therefore be interpreted within the context of early-stage adoption among digitally engaged consumers. From an academic perspective, future research is encouraged to further integrate Buddhist analytical frameworks with contemporary consumer behavior theories, to test the proposed TAM-Yonisomanasikara Reflective Acceptance Model across more demographically diverse populations, to employ longitudinal designs examining changes in reflective coping over time, and to incorporate qualitative approaches exploring culturally embedded decision-making processes. Overall, this study affirms that the sustainable and socially responsible development of unmanned convenience stores in Thailand depends on aligning technological innovation with Buddhist principles of discernment, balance, and concern for collective well-being.

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