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Factors Influencing User Satisfaction with Mobile Applications for Promoting Thai Community Products

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Abstract

This study investigates key factors affecting user satisfaction with mobile applications like Shopee, Lazada, and TikTok Shop, focusing on promoting community products in Pathum Thani Province, Thailand. As mobile applications gain significance for marketing local goods, the research aims to explore how various features influence satisfaction and trust among users. The study collected data from 400 local entrepreneurs between January and March 2024, all experienced in using mobile apps to sell products. A confirmatory factor analysis (CFA) was conducted to examine five critical factors: requirements, accessibility, accuracy, security, and trust. The findings indicate that accuracy ($\beta = 0.75$) and accessibility ($\beta = 0.71$) significantly impact user satisfaction, emphasizing the importance of precise content and ease of use. Additionally, security ($\beta = 0.76$) and trust ($\beta = 0.72$) play crucial roles in maintaining user confidence in app transactions. All model indicators were validated at the 0.01 significance level, indicating a good fit for the hypothesized relationships between factors. The study's novelty lies in highlighting specific app features that enhance user experiences in promoting local products. By focusing on the essential aspects of mobile app functionality, this research provides valuable insights to developers and local businesses for creating effective platforms, ultimately supporting sustainable economic growth.

Keywords: Community Products, E-Commerce, Security, Smartphones, Thailand

1. Introduction

As technology and artificial intelligence (AI) continue to advance rapidly, their impact on e-commerce is becoming increasingly profound [1], [2], [3]. AI, in particular, has been identified as a key driver of product personalization and customization, improving user experiences in digital environments [4]. The widespread adoption of information and communication technology (ICT), especially mobile devices, has transformed how businesses operate, with smartphones playing a critical role in marketing and sales for e-commerce [5], [6].

Mobile applications have significantly enhanced the user experience by providing diverse features that facilitate real-time communication, efficient transactions, and personalized services. Popular platforms like Shopee, Lazada, and TikTok Shop have revolutionized e-commerce in Southeast Asia, capturing substantial market shares and shaping user behaviour through convenient and accessible mobile interfaces [7]. The Thai government, particularly the Ministry of Commerce, is committed to promoting e-commerce, encouraging businesses at all levels to integrate into the online marketplace, and systematically collecting online trade data to formulate consumer-centric policies.

While these developments illustrate the broader trends in mobile commerce, a critical question remains: how do these advancements translate to user satisfaction in more niche markets, such as the promotion of community-based products [8], [9]? In particular, promoting community products [10], [11], such as those produced through Thailand's One

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Tambon One Product (OTOP) initiative [12], [13], [14], [15], requires a deeper understanding of the factors that influence user satisfaction and the effectiveness of mobile applications in this context [16], [17]. However, the success of these applications is contingent upon their ability to meet user needs—especially in terms of functionality, ease of use, and reliability—thereby influencing user satisfaction.

In the context of this research, several critical factors are identified as having a significant influence on user satisfaction with mobile applications designed to promote community products. These factors include accuracy, accessibility, security, and trust [18]. Each of these variables plays a vital role in shaping user experiences and perceptions, which, in turn, affects satisfaction levels.

Accuracy refers to the extent to which the information provided by the application (e.g., product details, inventory status, and pricing) is precise and reliable. Accurate information helps users make informed decisions and enhances trust in the platform [19].

Accessibility is defined as the ease with which users can navigate and use the application. This includes aspects like the user interface, mobile compatibility, and the ability to access the application from various devices and locations [20].

Security involves the measures taken by the application to protect users' personal data and ensure secure transactions. The perception of strong security features is essential for building user confidence, especially in the context of financial transactions and personal information [21].

Trust is the level of confidence users have in the platform's ability to meet their needs consistently and safely. Trust is closely linked to both the security and accuracy of the application and is a critical factor in long-term user engagement [22].

By clearly defining these variables upfront, this study provides a framework for analyzing how each factor influences user satisfaction in mobile applications designed for promoting community products. Understanding these key factors is essential for improving the effectiveness of mobile applications and fostering the economic sustainability of local communities.

Therefore, this research focuses on identifying the key factors influencing user satisfaction in mobile applications tailored for community product promotion. By examining the user experience and satisfaction levels in the context of grassroots economies, this study seeks to provide insights into how mobile applications can better serve the needs of local traders and enhance the marketability of community products.

The rapid development of mobile applications has transformed the way community products are marketed and sold [4], [23]. Despite the potential benefits of using mobile applications for promoting community products, there remains a significant gap in understanding how effectively these applications meet user needs and enhance market reach. In particular, there is a need to analyze and validate the consistency and reliability of models that measure the use of these applications. This research seeks to address the problem of insufficient empirical evidence regarding the effectiveness and consistency of mobile application models in promoting community products [24]. As such, the following research objectives (ROs) and research questions (RQs) have been developed:

RO1. To analyze the model used to measure mobile application usage in promoting community products [25].
RO2. To assess the reliability and consistency of the model for mobile application use in promoting community products [26].
RO3. To identify key factors in mobile applications that influence their effectiveness in promoting community products.
RO4. To provide recommendations for improving mobile application features and functionality based on the analysis.

RQ1. What are the key measurement model's components for measuring the use of mobile applications to promote community products?

RQ 2. How consistent and reliable is the measurement model?

RQ 3. What are the main factors influencing the measurement model's effectiveness?

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RQ 4. How can mobile applications be improved to better meet the needs of users and enhance the promotion of community products?

2. Methodology

This section details the methods and materials used to conduct the study.

2.1. Population and Sample

The study's population comprises residents of Pathum Thani Province who have experience selling community products through smartphone platforms using Shopee, Lazada, and TikTok Shop [5], [6]. A convenience sample of 400 individuals was randomly selected (table 1) [27]. Convenience sampling was selected due to the accessibility of entrepreneurs actively using mobile applications during the data collection period. This method allowed us to efficiently reach participants from various districts of Pathum Thani Province who represent a diverse cross-section of mobile application users. While convenience sampling is a non-probabilistic method, it was appropriate given the exploratory nature of the study and its focus on the practical usage of mobile platforms in community product promotion. Participants were selected based on their active involvement in selling products through Shopee, Lazada, and TikTok Shop, ensuring that the sample reflects users with relevant experience in e-commerce.

Table 1. Survey population and sample obtained

District	Population	Sample
Mueang Pathum Thani	211,230	60
Khlong Luang	288,752	62
Thanyaburi	212,181	60
Nong Suea	54,708	52
Lat Lum Kaeo	69,300	53
Lam Luk Ka	284,419	61
Sam Kok	57,064	52
Totals	**1,177,654**	**400**

Source: [20].

2.2. Research Tools

The authors used Google Form to gather data on the use of mobile applications to promote community products. The questionnaire consisted of two parts: demographic data collection and opinion-based questions related to mobile application use. The opinion section used a 5-point Likert scale to evaluate factors such as accuracy, accessibility, security, and trust. These items were validated by five experts, and a pilot study was conducted with 30 participants, yielding a Cronbach's Alpha of 0.90, indicating high internal consistency. The scale anchors used '5' as an indicator of strongest agreement while '1' was the anchor for the strongest disagreement.

In addition to evaluating reliability using Cronbach's alpha, the content validity of the questionnaire was established through expert review. Five specialists in mobile application usability and community commerce reviewed the questionnaire, ensuring that the questions were aligned with the study's objectives and accurately measured the constructs of interest. Additionally, a pilot test with 30 participants, not included in the final sample, was conducted to assess the clarity of the questions. Based on their feedback, minor adjustments were made to improve the wording and structure of several items, further strengthening the validity of the instrument.

2.3. Data Collection Methods

The data for the research were collected using the following methods from both primary and secondary data. Primary data consisted of the collection of documents, statistics, and records from government agencies, books, textbooks, printed media, the internet, journals, academic articles, and related research reports. Secondary data consisted of data

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collected from sellers and traders using smartphones and Shopee, Lazada, and TikTok Shop online platforms. Data collection spanned three months from January to March 2024, and involved several steps.

Firstly, the researchers explained the research objectives and each question to the respondents, providing both paper forms and online Google Forms for convenience. Next, the completed questionnaires were reviewed for completeness, coded, and analyzed using statistical software.

2.4. Data Analysis

The data analysis involved two main types of statistics. These included the use of descriptive statistics to help categorize the basic data, including frequency distribution, percentage, mean, and standard deviation (SD), to explain responses. The IBM SPSS program was used for this analysis. Inferential statistics were used to test the hypothesis through a CFA using LISREL 9.1 software.

2.5. CFA Goodness-of-Fit (GoF)

To determine the model fit for the second-order CFA, a GoF was undertaken in which convergent validity (CV) was used for construct relationship verification (table 2). Theory suggests that common criteria used for CV analysis include the GFI, comparative fit index (CFI), root mean square error of approximation (RMSEA), and the chi-square/df statistic [28].

Table 2. GoF criteria and study results

Criteria Index	Criteria	Theory	Study Values	Results
Chi-square: $\chi 2$	$p \geq 0.05$	[29]	0.06	passed
Relative Chi-square: $\chi 2/df$	≤ 2.00	[29]	1.31	passed
RMSEA	≤ 0.05	[28]	0.02	passed
NFI	≥ 0.90	[30]	0.99	passed
CFI	≥ 0.90	[31]	1.00	passed
RMR	≤ 0.05	[32]	0.03	passed
Standardized Root Mean Residual (SRMR)	≤ 0.05	[32]	0.03	passed
GFI	≥ 0.90	[33]	0.95	passed
AGFI	≥ 0.90	[33]	0.92	passed
Cronbach's Alpha	≥ 0.70	[34]	0.90	passed

3. Results and Discussion

3.1. Survey Respondent Characteristics

The majority of respondents were female, accounting for 59.50%, while the age distribution of the respondents varied widely, with the largest age group being 31-40 years old, comprising 25.50% of the total (table 3). This was followed closely by the 41-50 age group, which represented 24.00%. In terms of marital status, the largest proportion of respondents were single, making up 44.50%. Many of the respondents had obtained a bachelor's degree (49.00%), while another 37.00% had education levels below a bachelor's degree. The occupational distribution highlighted that a substantial portion of respondents were company employees (34.75%), while state enterprise employees constituted 18.00%, and government officials made up another 14.75%. The income levels of respondents were diverse, with the largest income group earning between $554 – $831, making up 25.50%. This was followed by those earning between $831 - $1,108 (18.00%).

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Table 3. Respondent characteristics (n=400)

Item	Respondents	%
Gender		
Men	162	40.50
Women	238	59.50
Age Group		
18 - 22	51	12.75
23 – 30	80	20.00
31 – 40	102	25.50
41 – 50	96	24.00
51 – 60	54	13.50
61 years of age or older	17	4.25
Relationship Status		
single	178	44.50
Married	152	38.00
divorce	51	12.75
separated	19	4.75
Education Level		
Below a bachelor's degree	148	37.00
Bachelor's degree	196	49.00
Master's degree	45	11.25
Doctoral level	11	2.75
Occupation		
Government service	59	14.75
State enterprise	72	18.00
Company employee	124	31.00
Personal business	26	6.50
Student/student	78	19.50
Other	41	10.25
Monthly Income		
10,000 baht or less ($280)	54	13.50
10,0001 - 20,000 baht ($280-$560)	43	10.75
20,0001 - 30,000 baht ($560-$840)	97	24.25
30,0001 - 40,000 baht ($840-$1,120)	98	24.50
40,0001 - 50,000 baht ($1,120-$1,395)	71	17.75
50,000 baht per month or more ($1,395 plus)	37	9.25

3.2. CFA Data Analysis

The data presented in table 4 details the results of the CFA for opinions on using community product promotion applications. Each item represents a specific feature or characteristic of the mobile application for selling community products, such as design, ease of use, functionality, security, and trust.

Moreover, in a CFA, 'B' and 'β' (beta). are commonly used to represent factor loadings or weights, indicating how strongly each observed variable (indicator) is associated with its underlying latent construct (element) [35]. Unstandardized regression coefficients (B) are the raw, unstandardized slope of the regression line between the predictor variable and the dependent variable. It shows the change in the dependent variable for a one-unit change in

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the predictor variable, holding all other predictors constant. On the other hand, β (beta) represents the standardized regression coefficient which is generally more important for interpretation because they are on a common scale (usually from -1 to 1 or 0 to 1), allowing for direct comparison of how strongly each indicator contributes to the latent construct.

Furthermore, the standard error (SE) measures the accuracy of the coefficient estimates. Smaller standard errors indicate more precise estimates, while larger SEs suggest greater uncertainty. The t-value is a ratio of the departure of an estimated parameter from its notional value (usually 0) to its standard error. It is used to determine the significance of the coefficients. Higher t-values (typically above 1.96 for a 95% confidence level) indicate that the coefficient is significantly different from zero. R-squared (R^2) values represent the proportion of variance in the observed variable that is explained by the latent construct. Higher R^2 values indicate that the model explains a substantial portion of the variance in the data. The mean shows the average rating given by respondents for each item, providing insight into overall satisfaction or agreement with each aspect of the mobile application. The SD indicates the variability or dispersion of the ratings. Lower standard deviations suggest that respondents' opinions are more consistent, while higher standard deviations indicate more varied responses.

Table 4. 2nd-order CFA results

Element/Indicator	Element weights				R2		
	β	B	SE	t**		mean	SD
Requirements (MAR)							
Mobile app's design, content, and images meet user needs (MAR1).	0.68	0.68	-	-	0.46	4.33	0.86
Mobile apps offer convenient steps that meet user needs (MAR2).	0.76	0.76	0.05	14.12	0.58	4.23	0.94
The mobile app has functionalities that meet user needs (MAR3).	0.78	0.78	0.05	14.13	0.61	4.21	0.93
Mobile apps' management aligns with user needs (MAR4).	0.78	0.78	0.05	13.13	0.61	4.17	0.96
Mobile apps are a preferred channel, meeting needs more effectively than other channels (MAR5).	0.72	0.72	0.05	13.07	0.52	4.10	1.02
Mobile apps provide fast and modern technology, meeting information needs better than other channels (MAR6).	0.67	0.68	0.05	12.52	0.46	4.19	0.94
Averages	0.73	0.73	0.05	13.39	0.54		
Accessibility (MAA)							
Mobile selling apps are easy to use and not complicated (MAA1).	0.68	0.68	-	-	0.46	4.20	0.90
Mobile selling apps are easily accessible (MAA2).	0.66	0.66	0.05	12.49	0.44	4.19	0.91
Mobile selling app content and language are easy to understand (MAA3).	0.67	0.67	0.05	12.73	0.46	4.33	0.87
Mobile selling app users can easily operate the mobile application by themselves (MAA4).	0.77	0.77	0.05	14.44	0.60	4.38	0.80
Mobile selling apps are accessible anytime, anywhere, and on any device, 24/7 (MAA5).	0.77	0.77	0.05	14.33	0.59	4.33	0.86
Mobile selling app users can check their login history to prevent mistakes at any time (MAA6).	0.71	0.71	0.05	13.41	0.51	4.33	0.79
Averages	0.71	0.71	0.05	13.48	0.51	4.20	0.90
Accuracy (MAC)							
The structure and design of mobile selling apps are accurate (MAC1).	0.72	0.72	-	-	0.51	4.36	0.83
The content and language used in the mobile application for selling community products are accurate (MAC2).	0.77	0.77	0.05	15.06	0.59	4.31	0.88
Mobile selling apps' communication and interaction are accurate (MAC3).	0.75	0.75	0.05	15.06	0.56	4.35	0.88

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Element/Indicator	Element weights				R2		
	β	B	SE	t**		mean	SD
Mobile selling apps processing system for selling community products is accurate (MAC4).	0.76	0.75	0.05	15.13	0.57	4.33	0.86
Mobile selling app displays are accurate (MAC5).	0.72	0.72	0.05	15.51	0.52	4.34	0.80
Mobile selling app management processes are accurate (MAC6).	0.77	0.77	0.05	15.51	0.60	4.23	0.85
Averages	0.75	0.75	0.05	15.25	0.56		
Security (MAS)							
Mobile selling apps have a secure identity verification and access system (MAS1).	0.79	0.79	-	-	0.62	4.22	0.85
Mobile selling app users have confidence in the security system (MAS2).	0.78	0.78	0.05	17.41	0.61	4.29	0.83
Mobile selling app communication processes are secure (MAS3).	0.74	0.74	0.05	16.19	0.54	4.29	0.81
Mobile selling apps' financial transaction systems, including payments and transfers, are secure (MAS4).	0.74	0.74	0.05	16.27	0.55	4.30	0.85
Mobile selling apps logistics system for transporting goods is secure (MAS5).	0.76	0.76	0.05	16.90	0.58	4.31	0.80
Mobile selling apps have strict and secure regulations to protect sellers' personal information (MAS6).	0.77	0.78	0.04	17.51	0.61	4.25	0.81
Averages	0.76	0.77	0.05	16.85	0.59		
Trust (MAT)							
Users have a good attitude and trust the mobile application's management system (MAT1).	0.72	0.72	-	-	0.52	4.22	0.86
Users trust the access system of the mobile application (MAT2).	0.67	0.67	0.04	15.49	0.45	4.25	0.79
Users trust the data processing on the mobile application (MAT3).	0.75	0.75	0.05	16.38	0.56	4.35	0.81
Users trust the display on the mobile application (MAT4).	0.69	0.70	0.05	13.60	0.49	4.33	0.83
Users trust the information, technology, and communication responses on the mobile application (MAT5).	0.72	0.73	0.05	14.23	0.53	4.25	0.86
Users recommend the mobile application for selling community products to others, highlighting its benefits (MAT6).	0.77	0.77	0.05	15.15	0.60	4.31	0.81
Averages	0.72	0.72	0.05	14.97	0.53		

**Sig.<.01

3.3. Second-Order CFA Model Fit

The second-order CFA model shows an excellent fit to the data, indicating that the hypothesized factor structure is well-supported (figure 1). The fit indices, including chi-square, p-value, and RMSEA, all suggest a well-fitting model, with RMSEA particularly reinforcing the adequacy of the model. This supports the validity of the second-order factors: requirements (MAR), accessibility (MAA), accuracy (MAC), security (MAS), and trust (MAT). These results demonstrate that the second-order CFA constructs are valid and that the data supports the hypothesized relationships between the observed variables and the higher-order latent factors. The second-order CFA conducted on the use of community product promotion applications, revealed significant results at the 0.01 level for all components analyzed, further validating the model.

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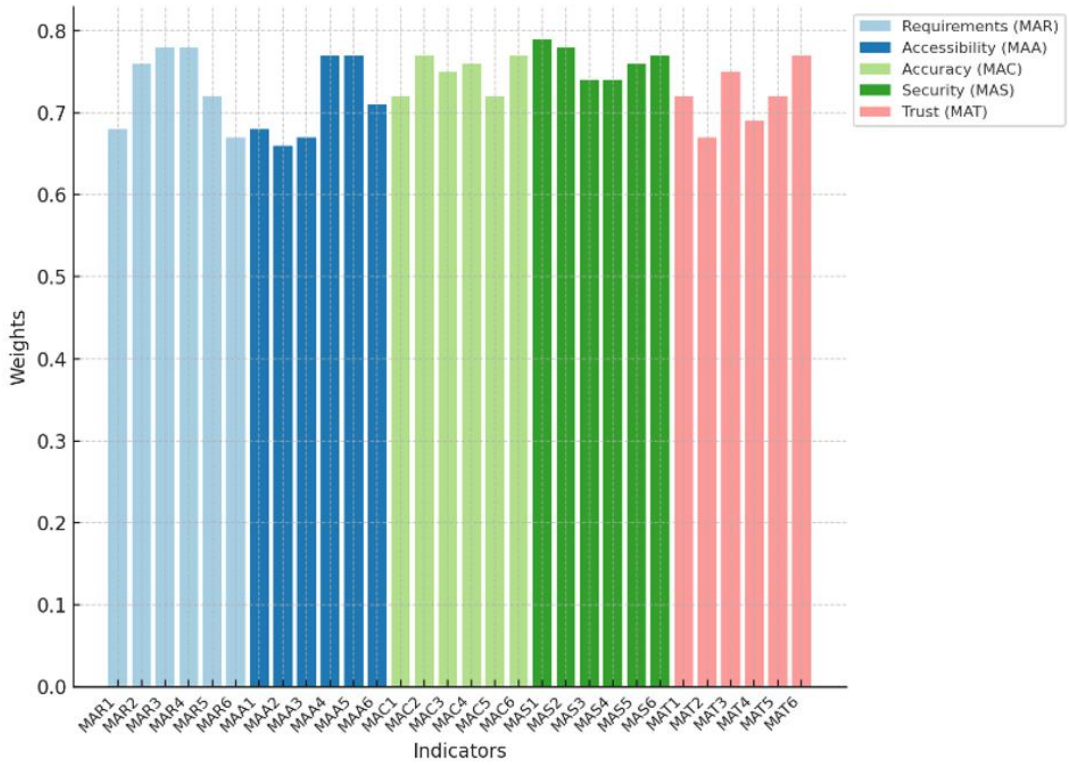

Figure 1. Final second-order CFA for Thai entrepreneur online mobile smartphone usability app indicators

Note: Weights are represented by β (beta-standardized regression coefficients)

3.4.Security (MAS)

Security emerged as the most critical element, with a mean weight of 0.765. This finding is consistent with the work of Ehikioya and Guillemot [36], who reported that networking and security are the greatest determinants of success in e-commerce applications. The most significant item within this component was the secure access system (MAS1), with a weight of 0.786, indicating that users highly value authentication and secure access [37], [38]. Additionally, the presence of strong legal protections to safeguard personal information (MAS6), with a weight of 0.783, underscores the necessity of legal frameworks to ensure user confidence. The lowest weighted item was the safety of communication (MAS3), which still maintained a respectable weight of 0.737, highlighting the overall importance of security across different facets of the application.

3.5. Accuracy (MAC)

Accuracy (MAC) also played a vital role, with an average weight of 0.747. This component emphasizes the precision and correctness of information and operations within the applications [39]. The most heavily weighted item was the accurate work steps (MAC6), scoring 0.772, which indicates that users prioritize the reliability of operational processes. Accurate language use (MAC2) followed closely with a weight of 0.768, emphasizing the need for clear and precise communication. Although the lowest weight in this component was attributed to the accurate design and development (MAC1), with a weight of 0.717, this still reflects a strong expectation for accuracy in application design.

3.6. Requirements (MAR)

In the CFA results, efficiency, satisfaction, and effectiveness were significant components of the measured usability factors. For example, the weight of 0.783 for the mobile application's ability to meet user needs (MAR3) directly reflects efficiency in delivering expected functionalities. Similarly, the high weight for design and content (MAR1, β = 0.68) demonstrates effectiveness in terms of usability, as users consistently rated applications with well-structured interfaces higher [40]. Satisfaction was most directly tied to the overall design and operation of the applications, as reflected by a weight of 0.772 for the accuracy of operational processes (MAC6). These weights demonstrate the relative importance of different usability factors and how they contribute to user satisfaction.

Requirements (MAR) had an average weight of 0.734, focusing on the essential functionalities that meet user needs. The most significant items within this component were the mobile application's ability to meet user needs through functionality (MAR3) and management (MAR4) both with a weight of 0.783. These findings are also consistent with a systematic review of mobile app usability conducted by Weichbroth [37] in which the author determined that the ISO 9241-11 usability definition has been adopted in an unchanged form and popularized as the standard. As such, from the 75 features identified, efficiency was ranked as the most important to mobile app users (70%) (figure 2). This was followed by satisfaction (66%) and effectiveness (58%). Quite interestingly at the bottom of the list was simplicity (13%) and ease of use (9%). However, in this study's measurement of mobile app ease of use (MAR2) to Thai entrepreneurs, it was determined to have had more significant importance [41], with a weight of 0.759. However, the ability to meet information technology needs faster than other channels (MAR6), with a weight of 0.679, was less critical compared to other requirements.

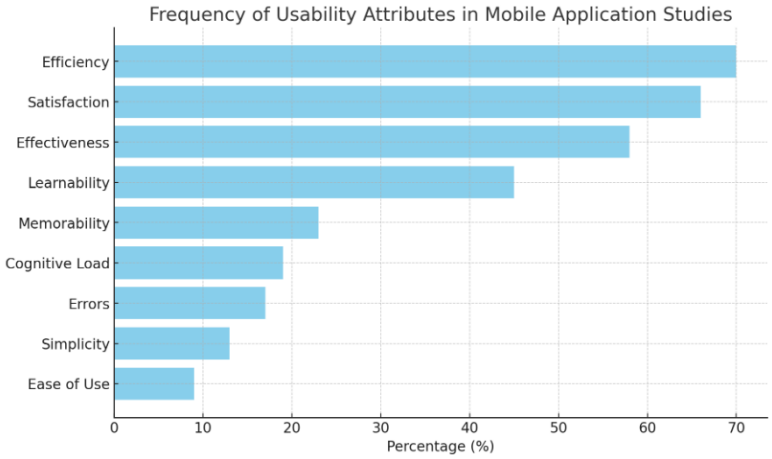

Figure 2. Mobile app usability frequency and attributes

Source: [39]

3.7. Accessibility (MAA)

In the CFA results, the item "ease of accessing functions" (MAA2, β = 0.66) had the lowest weight within the accessibility construct. This lower weight suggests that while functional access is important, users prioritize other aspects of accessibility, such as the overall ease of use (MAA1, β = 0.77) and 24/7 availability (MAA5, β = 0.77) [42] Michels. These results indicate that users may find mobile applications generally accessible in terms of interface design but are less concerned with the intricacies of accessing specific functions, particularly when other factors like reliability and convenience are met.

3.8. Trust (MAT)

The trust construct was measured using six items, including confidence in the mobile application's security systems (MAS2, β = 0.78) and user recommendations (MAT6, β = 0.77) [43]. The relatively high weight of security-related items reflects the importance users place on feeling secure when using mobile applications for financial transactions and data sharing. In contrast, trust in the application's access system (MAT2, β = 0.67) received a lower weight, suggesting that while security is paramount, other aspects of trust, such as access reliability, are less critical. These findings demonstrate that building user trust, particularly in the application's ability to protect sensitive information, is essential for fostering long-term usage and satisfaction. Trust in data processing (MAT3) was also significant, with a weight of 0.75, emphasizing the importance of reliable data handling [44].

3.9. E-commerce Growth

Thailand's e-commerce sector has experienced significant growth in recent years, driven by increased internet penetration, widespread smartphone usage, and government initiatives aimed at promoting online trade [45]. With Thai mobile commerce through the use of social media expected [45] to account for over 80% of online sales by 2025, the role mobile applications play in the country's digital economy is critical. However, other sources further illustrate the

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multifaceted drivers of this growth such as Statista [46] which projects Thailand's e-commerce revenue to reach $19.28 billion in 2024. This is being driven by increased online retail activities, particularly in the beauty and personal care items, food, electronics, and fashion products (figure 3).

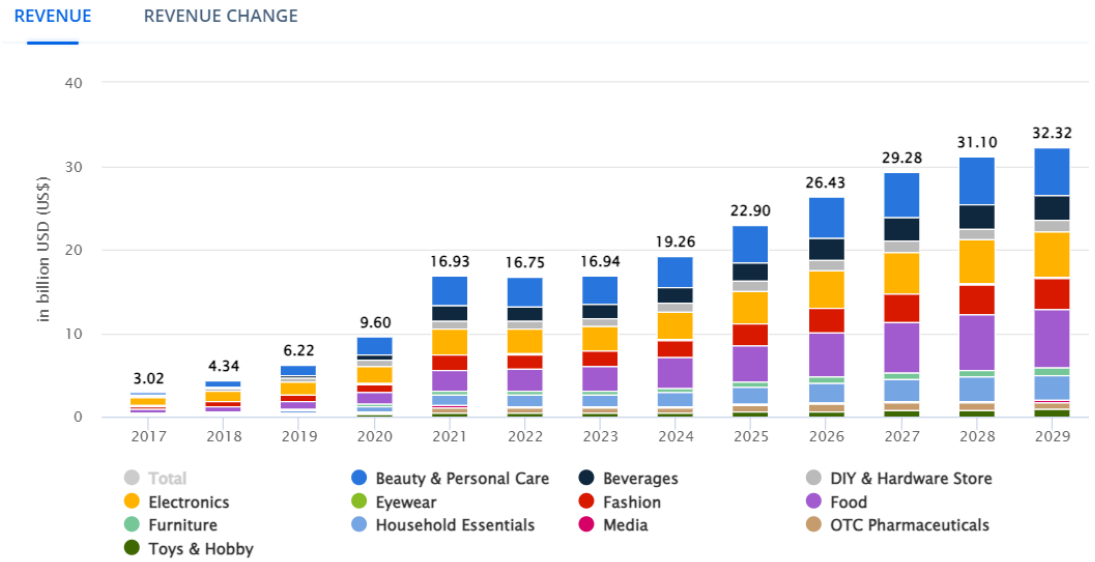

Figure 3. Thai e-commerce growth [46]

The government's policies, such as the "Thailand 4.0" initiative, also support e-commerce growth by encouraging digitalization and the integration of online platforms in both urban and rural areas [47], [48]. The future of e-commerce in Thailand is promising, driven by technological advancements, better internet access, and evolving consumer behaviors. AI and Big Data will enable personalized shopping [23], [49], optimized supply chains, and improved customer service [22]. Social commerce, through platforms like shoppable posts and live streaming, is rising, especially among younger consumers. Omni-channel retailing is also growing, as consumers expect seamless experiences across online and offline stores. With better internet and logistics, rural e-commerce offers new growth opportunities. Additionally, sustainability and ethical consumerism are becoming key, with businesses focusing on eco-friendly practices to attract conscientious consumers. Companies that embrace these trends will be well-positioned for success in Thailand's evolving digital economy.

Moreover, a World Economic Forum report emphasizes that Southeast Asia's digital economy, including Thailand, is expanding rapidly due to the shift in consumer behavior post-pandemic. The surge in demand for online shopping has prompted businesses to invest in improving their digital infrastructure, thus accelerating the adoption of mobile applications for a $1 trillion e-commerce regional economy by 2030.

These additional perspectives underscore the rapid and diverse growth of Thailand's e-commerce market, driven not only by technological advancements but also by changing consumer habits and supportive government policies. This broader view strengthens the analysis of the role mobile applications play in promoting local and community products, especially in rural and semi-urban areas where mobile penetration is critical.

The analysis revealed that accuracy and accessibility are the most critical factors driving user satisfaction with mobile applications for community product promotion. Security and trust also emerged as significant contributors [17], [28], [30]. In Section 3.6, we discussed the weight values for accuracy, which averaged 0.747. In comparison, the weight values for accessibility averaged 0.712, while security (0.765) and trust (0.724) also showed strong contributions [18]. This comparative analysis highlights that while all factors significantly impact user satisfaction, security emerged as the most critical component, slightly outweighing accuracy. This suggests that while the precision of information is essential, users prioritize secure interactions and data protection when using mobile applications for e-commerce. Accessibility, though important, was slightly less critical compared to accuracy and security.

Accuracy, in this context, refers to the precision and reliability of the information provided by the mobile applications, such as product details, transaction processes, and customer interactions. Accessibility pertains to how easily users can navigate and use these applications, including seamless 24/7 access across various devices.

These findings align with prior research on e-commerce platforms, which highlights that user prioritize application functionality, reliability, and ease of use [41]. However, the emphasis on security and trust—especially in the context of financial transactions and user data protection—introduces an additional layer of importance for community entrepreneurs in Pathum Thani Province. Previous studies have also noted the importance of security in e-commerce success, particularly in developing markets where trust in online systems is crucial for adoption [38].

This study's novelty lies in its regional focus on Pathum Thani Province, providing empirical data specific to community entrepreneurs. While much research has focused on urban or national-level e-commerce trends, this study highlights the unique challenges and opportunities faced by local entrepreneurs. By validating a model that includes these key satisfaction factors, this research contributes new insights into mobile application usability within the context of community product promotion in Thailand.

4. Conclusion

The second-order CFA of community product promotion applications highlights five critical components essential for their success: security, accuracy, meeting user requirements, accessibility, and trust. Security stands out as the most crucial, with users prioritizing secure access systems and robust legal protections. Accuracy is highly valued for its role in ensuring reliable operational processes and clear communication. The requirements component underscores the need for comprehensive functionality and efficient management, enabling applications to meet user needs effectively. Accessibility is vital for ease of use and the ability to access applications anytime and anywhere. Trust remains pivotal, as users rely on strong recommendations and the reliable handling of their data.

The findings also show that accuracy and accessibility are paramount in determining user satisfaction with mobile applications. Users expect mobile platforms to provide precise product information and reliable transaction processes, which directly impact their willingness to continue using the apps. These results underscore the importance of developing mobile applications that are not only easy to use but also accurate and trustworthy.

The significance of security and trust cannot be overstated. For community entrepreneurs, the safety of financial transactions and the protection of personal information are critical to fostering long-term use. These findings are consistent with prior research by Ehikioya and Guillemot [36], which noted that security systems, particularly for financial transactions, are key determinants of success in mobile commerce [17], [28], [30].

These findings provide valuable insights into the development and improvement of community product promotion applications. By prioritizing these key components, developers can create more effective and user-friendly applications that meet the evolving needs of their communities.

Despite the valuable insights gained from this study, several limitations should be acknowledged. First, the relatively small sample size may limit the generalizability of the findings. The results may not fully represent the broader spectrum of community product promotion applications, as the study focused on a specific subset of these applications. Additionally, the cross-sectional nature of the research does not allow for the examination of changes in user preferences or application effectiveness over time.

In addition to the sample size and generalizability, other potential limitations of this study include response bias due to the use of convenience sampling. Participants who are more familiar with mobile applications may have been more likely to respond, potentially skewing the results. Furthermore, the reliance on self-reported data introduces the possibility of social desirability bias, where respondents may have provided answers, they believe are more socially acceptable. Finally, the use of both online and paper questionnaires may have introduced variability in responses, as different modes of data collection can result in differences in how questions are interpreted.

Future research could benefit from employing a larger, randomized sample to improve the generalizability of the findings. Expanding the sample to include a broader range of regions beyond Pathum Thani Province would provide a more comprehensive understanding of mobile application usage in different cultural and socio-economic contexts.

Additionally, a longitudinal study could track changes in user satisfaction over time, particularly as mobile applications evolve and user expectations shift. Such studies could provide valuable insights into the long-term impacts of mobile app improvements on community commerce and user satisfaction.

5. Declarations

5.1. Author Contributions

Conceptualization: K.P. and S.I.; Methodology: K.P. and S.I.; Software: N.P. and K.P.; Validation: K.P. and S.I..; Formal Analysis: K.P. and N.P..; Investigation: S.I. and N.P..; Resources: K.P. and S.I.; Data Curation: K.P. and N.P.; Writing Original Draft Preparation: K.P. and S.I.; Writing Review and Editing: N.P. and S.I.; Visualization: K.P. and N.P.; All authors have read and agreed to the published version of the manuscript.

5.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

5.3. Funding

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5.4. Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Human Research Ethics Committee at Rajamangala University of Technology, Thanyaburi, Thailand (protocol code COA. No.25 with an expiration date of 3 April 2025).

5.5. Informed Consent Statement

A signed informed consent form for each of the study's pilot-survey group and the main study's respondents was also obtained. At every step, the anonymity of the participants was considered and ensured, with all interviewees informed that no information concerning their private information would be used. All other survey participants gave their informed consent for inclusion before they participated in the study.

5.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] A. Y. Areiqat, A. F. Alheet, R. A. Qawasmeh, and A. M. Zamil, "Artificial intelligence and its drastic impact on e-commerce progress," *Academy of Strategic Management Journal*, vol. 20, no. special issue 2, pp. 1-11, 2021.

[2] R. E. Bawack, S. F. Wamba, K. D. A. Carillo, and S. Akter, S. "Artificial intelligence in E-Commerce: a bibliometric study and literature review," *Electronic Markets*, vol. 32, no. 1, pp. 297-338, 2022.

[3] D. Zhang, L. G. Pee, and L. Cui, "Artificial intelligence in E-commerce fulfillment: A case study of resource orchestration at Alibaba's Smart Warehouse," *International Journal of Information Management*, vol. 57, no. 4, article 102304, pp. 1-12, 2021. doi: 10.1016/j.ijinfomgt.2020.102304.

[4] L. T. Khrais, "Role of artificial intelligence in shaping consumer demand in E-commerce," *Future Internet*, vol. 12, no. 12, article 226, 2020.

[5] H. Guner and C. Acarturk, "The use and acceptance of ICT by senior citizens: a comparison of technology acceptance model (TAM) for elderly and young adults," *Universal Access in the Information Society*, vol. 19, no. 2, pp. 311-330, 2020.

[6] R. J. James, G. Dixon, M. G. Dragomir, E. Thirlwell, and L. Hitcham, "Understanding the construction of 'behavior' in smartphone addiction: A scoping review," *Addict. Behav.*, vol. 137, no. 2, article 107503, pp. 1-9, 2023. doi: 10.1016/j.addbeh.2022.107503.

[7] N. Fitriani, D. Setiawan, Y. A. Aryani, and T. Arifin, "Does social media affect performance in e-commerce business? The role of customer management," *J. Open Innov.: Technol., Market, Complex.*, vol. 9, no. 4, article 100171, 2023.

[8] H. Akhmadi and S. Pratolo "Online marketing of food products through marketplace platform: A study of community based online marketplace of Bedukmutu," in *E3S Web of Conferences*, vol. 232(2021), no. 1, article 02015, pp. 1-10, 2021. doi: 10.1051/e3sconf/202123202015.

[9] S. Phunsa, "Developing an interactive augmented reality to promote the products of local entrepreneurs," *J. Adv. Inf. Technol.*, vol. 10, no. 2, pp. 77-80, 2021.

[10] S. Bureekhampun and C. Maneepun, "Eco-Friendly and community sustainable textile fabric dyeing methods from Thai buffalo manure: From pasture to fashion designer," *SAGE Open*, vol. 11, no. 4, pp. 1-13, 2021.

[11] M. Hampton, S. O'Hara, and E. Gearin, "Assessing Restorative Community Development Frameworks—A Meso-Level and Micro-Level Integrated Approach," *Sustainability*, vol. 16, no. 5, article 2061, pp. 1-11, 2024. doi: 10.3390/su16052061.

[12] C. Rattanachu and K. Rothjanawan, "The development of an application for OTOP marketplace with Android smartphones: A case study of OTOP products from Khok Khian Subdistrict," Int. J. Sci. Innov. Technol., vol. 7, no. 1, pp. 81-88, 2024.

[13] V. Sitabutr and P. Pimdee, "Thai entrepreneur and community-based enterprises' OTOP branded handicraft export performance: A SEM analysis," *SAGE Open*, vol. 7, no. 1, pp. 1-12, 2017. doi: 10.1177/2158244016684911.

[14] Food and Agricultural Organization of the United Nations, *Regional knowledge platform on One Country One Priority Product (OCOP) in Asia and the Pacific. One Tambon One Product (OTOP) to promote grass-roots economy in Thailand*," 2022. Retrieved from https://www.fao.org/one-country-one-priority-product/asia-pacific/good-practices/detail/one-tambon-one-product-(otop)-to-promote-grassroots-economy-in-thailand/en

[15] S. Suthivorapongsri, J. Angsukanchanakul, and S. Maneechai, "Guidelines for improving the achievement of sustainable OTOP Inno-Life Tourism Community Enterprises: Evidence from the Lower Northeastern Region of Thailand," *Asian Adm. Manage. Rev.*, vol. 6, no. 1, pp. 130–140, 2023.

[16] A. Ngubelanga and R. Duffett, "Modeling mobile commerce applications' antecedents of customer satisfaction among millennials: An extended tam perspective," *Sustainability*, vol. 13, no. 11, article 5973, pp. 1-9, 2021. doi: 10.3390/su13115973.

[17] V. Sharma, I. You, K. Andersson, F. Palmieri, M. H. Rehmani, and J. Lim, "Security, privacy and trust for smart mobile-Internet of Things (M-IoT): A survey," *IEEE access*, vol. 8(2020), no. 1, pp. 167123-167163, 2020.

[18] P. Chuenban, P. Sornsaruht, and P. Pimdee, "How brand attitude, brand quality, and brand value affect Thai canned tuna consumer brand loyalty," *Heliyon*, vol. 7, no. 2, article e06301, pp.1-9, 2021.

[19] A. Alshayban, I. Ahmed, and S. Malek, "Accessibility issues in android apps: State of affairs, sentiments, and ways forward," *In Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering, June*, 2020, vol. 42, no. Jun., pp. 1323-1334, 2020.

[20] E. Dzidzah, K. Owusu Kwateng, and B. K. Asante, "Security behaviour of mobile financial service users," *Information and Computer Security*, vol. 28, no. 5, pp. 719-741, 2020.

[21] S. Sarkar, S. Chauhan, and A. Khare, "A meta-analysis of antecedents and consequences of trust in mobile commerce," *International Journal of Information Management*, vol. 50, no. February 2020, pp. 286-301, 2020.

[22] L. T. Khrais and A. M. Alghamdi, "The role of mobile application acceptance in shaping e-customer service," *Future Internet*, vol. 13, no. 3, p. 77, 2021.

[23] S. Limpeeticharoenchot, N. Cooharojananone, T. Chanvanakul, N. Tuaycharoen, and K. Atchariyachanvanich, "Innovative mobile application for measuring big data maturity: Case of SMEs in Thailand," *Int. J. Interact. Mobile Technol.*, vol. 14, no. 18, pp. 87-106, 2020.

[24] L. V. Casaló, C. Flavián, and M. Guinalíu, "Relationship quality, community promotion, and brand loyalty in virtual communities: Evidence from free software communities," *Int. J. Inf. Manage.*, vol. 30, no. 4, pp. 357-367, 2010.

[25] K. Rattanaburi and R. Vongurai, "Factors influencing actual usage of mobile shopping applications: Generation Y in Thailand," *J. Asian Finance, Econ. Bus.*, vol. 8, no. 1, pp. 901-913, 2021.

[26] K. Chatdamrongkun and N. Chanthasom, "Financial transactions on smartphone of people in Pathumthani Province," *In 16th RSU Nat. Grad. Res. Conf.*, vol. 16, 2021, pp. 1647-1658, 2021.

[27] M. M. Rahman, "Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations," *J. Entrep. Bus. Econ.*, vol. 11, no. 1, pp. 42-62, 2023.

[28] G. S. Sureshchandar, "Quality 4.0–a measurement model using the confirmatory factor analysis (CFA) approach," *International Journal of Quality & Reliability Management*, vol. 40, no. 1, 280-303, 2023.

[29] M. S. Ben-Shachar, I. Patil, R. Thériault, B. M. Wiernik, and D. Lüdecke, "Phi, Fei, Fo, Fum: Effect sizes for categorical data that use the chi-squared statistic," *Mathematics*, vol. 11, no. 9, article 1982, 2023.

[30] A. Ş. Zeyrek, Ö. Fidan, and N. Ç. Köktaş, "The adaptation of the nurse turnover intention scale into Turkish: A validity and reliability study," *International Journal of Nursing Practice*, vol. 29, no. 2, article e13109, 2023.

[31] D. Paliwal and R. Kumar, R. "Exploring the five-factor structure of the need for closure scale on Indian samples using exploratory and confirmatory factor analysis," *European Journal of Psychology and Educational Research*, vol. 5, no. 1, pp. 45-51, 2022.

[32] I. Doğan, "A simulation study comparing model fit measures of structural equation modeling with multivariate contaminated normal distribution," *Commun. Stat. Simul. Comput*., vol. 51, no. 5, pp. 2526-2536, 2020.

[33] S. Sathyanarayana and T. Mohanasundaram, "Fit indices in structural equation modeling and confirmatory factor analysis: Reporting guidelines," *Asian Journal of Economics, Business and Accounting*, vol. 24, no. 7, pp. 561-577, 2024.

[34] N. Shrestha, "Factor analysis as a tool for survey analysis," *American Journal of Applied Mathematics and Statistics*, vol. 9, no. 1, pp. 4-11, 2021.

[35] P. Pimdee, "An analysis of the causal relationships in sustainable consumption behaviour (SCB) of Thai student science teachers," *International Journal of Instruction*, vol. 14, no. 1, pp. 999-1018, 2021.

[36] S. A. Ehikioya, and E. Guillemot, "A critical assessment of the design issues in e-commerce systems development," *Engineering Reports*, vol. 2, no. 4, article e12154, pp. 1-7, 2020. doi: 10.1002/eng2.12155.

[37] P. Weichbroth, "Usability of Mobile Applications: A Systematic Literature Study," in *IEEE Access*, vol. 8(2020), no. 1, pp. 55563-55577, 2020.

[38] P. Weichbroth and Ł. Łysik, "Mobile security: Threats and best practices," *Mobile Information Systems*, vol. 2020, no. 1, Article ID 8828078, pp. 1-12, 2020. doi: 10.1155/2020/8828078

[39] J. Mendes, T. M. Pinho, F. Neves dos Santos, J. J. Sousa, E. Peres, J. Boaventura-Cunha, and R. Morais, "Smartphone applications targeting precision agriculture practices—A systematic review," *Agronomy*, vol. 10, no. 6, article 855, pp. 1-44, 2020.

[40] M. Zhang, G. Hou, and Y. C. Chen, "Effects of interface layout design on mobile learning efficiency: a comparison of interface layouts for mobile learning platform," *Library Hi Tech*, vol. 41, no. 5, pp. 1420-1435, 2023.

[41] X. Li, X. Zhao, and W. Pu, "Measuring ease of use of mobile applications in e-commerce retailing from the perspective of consumer online shopping behaviour patterns," *Journal of Retailing and Consumer Services*, vol. 55, no. July, article 102093, pp. 1-12, 2020. doi: 10.1016/j.jretconser.2020.102093.

[42] M. Michels, W. Fecke, J. H. Feil, O. Musshoff, F. Lülfs-Baden, and S. Krone, "Anytime, anyplace, anywhere"—A sample selection model of mobile internet adoption in German agriculture," *Agribusiness*, vol. 36, no. 2, pp. 192-207, 2020.

[43] G. Lăzăroiu, O. Neguriţă, I. Grecu, G. Grecu, and P. C. Mitran, "Consumers' decision-making process on social commerce platforms: Online trust, perceived risk, and purchase intentions," *Frontiers in Psychology*, vol. 11, article 890, 2020.

[44] A. Sharma, E. S. Pilli, A. P. Mazumdar, and P. Gera, "Towards trustworthy Internet of Things: A survey on trust management applications and schemes," *Computer Communications*, vol. 160, 1 July 2020, pp. 475-493, 2020.

[45] A. Infante and R. Mardikaningsih, "The potential of social media as a means of online business promotion," *Journal of Social Science Studies*, vol. 2, no. 2, pp. 45-49, 2022.

[46] Statista, *eCommerce-Thailand*. 2024. Retrieved from https://www.statista.com/outlook/emo/ecommerce/thailand.

[47] Q. Qiu, "Comparative analysis of Lazada and Shopee e-commerce firms in Southeast Asia: Alibaba strategies for competing in the regional market," *Front. Bus., Econ. Manage*., vol. 15, no. 3, pp. 401-413, 2024.

[48] J. Jongwanich, "Readiness of Thailand towards the digital economy," *Journal of Southeast Asian Economies*, vol. 40, no. 1, pp. 64-95, 2023.

[49] M. Abuhamdeh, O. Qtaish, H. Kanaker, A. Alshanty, N. Yousef, and A. M. AlAli, "Leveraging Big Data and AI in Mobile Shopping: A Study in the Context of Jordan," *International Journal of Advanced Computer Science and Applications*, vol. 14, no. 7, pp. 226-232, 2023.