

Factors Influencing Older Adults' Acceptance of Online Herbal Dietary Supplement Services: A Case Study of the Thailand Post Company in the Lower Central Region

Ntapat Worapongpat

Eastern Institute of Technology Suvarnabhumi (EIT)
and Faculty of Humanities and Social Sciences, Rajabhat Maha Sarakham University.
(RMU)

*Corresponding Author, e-mail: dr.thiwat@gmail.com Tel 095 5426414
ORCID ID: <https://orcid.org/0009-0008-3071-5249>

Received February 20, 2025

Revised March 30, 2025

Accepted April 8, 2025

Abstract

The increasing reliance on digital platforms for health-related products has highlighted the importance of understanding factors that influence older adults' acceptance of online herbal dietary supplement ordering services. This study aimed to investigate the personal characteristics and online usage behavior of older adults, assess their level of acceptance of such services, and analyze the key factors influencing the adoption of Thailand Post Company's online ordering system. A structured questionnaire was administered to 400 residents aged 60 and above in Nonthaburi Province, Thailand, and supplemented with qualitative insights. The instrument was validated through expert review and pilot testing, achieving a Cronbach's alpha coefficient of 0.95. Data were analyzed using descriptive statistics, t-tests, ANOVA, correlation analysis, and multiple regression analysis. The findings revealed that most participants were female, had at least secondary education, and possessed sufficient income to shop online. Ease of use and system security emerged as critical determinants of service usage, while both attitude toward usage and ease of use significantly influenced acceptance of Thailand Post's online services. These results underscore the importance of designing online platforms that prioritize simplicity, security, and the specific needs of older adults. The findings provide practical implications for improving digital service delivery in the health sector and inform future policy and research on technology adoption among aging populations.

Keywords: Online Service Acceptance, Herbal Supplement, Older Adults, Technology Adoption, Thailand Post

1. Introduction

The rapid advancement of Information and Communication Technology (ICT) has significantly reshaped consumer behavior, particularly in online commerce. In Southeast Asia, e-commerce has experienced continuous growth, with herbal and health-related products among the most frequently purchased items (Euapitaksakul & Benjarongkij, 2023). Despite this expansion, older adults often encounter barriers such as limited digital literacy, concerns over cybersecurity, and difficulties with online payment systems (Jaita & Netpradit, 2024). While existing research highlights market growth trends, studies focusing on elderly consumers' acceptance of digital services in Thailand remain limited (Worapongpat, 2022), especially in the context of herbal dietary supplement ordering services. (Piwpong & Tancho, 2021).

Thailand Post has emerged as a key provider of online services, including the delivery of herbal supplements. (Pinchumpholsang, Kongthap, Chuendan, Jaichuen, & Sriin, 2022). This channel gained prominence during the COVID-19 pandemic for its reliability and nationwide coverage (Wiyajroen, 2017). However, in the lower central region, older adults continue to show relatively low adoption due to concerns about transaction security, interface complexity, and trust in digital platforms (Radsadondeetaechakul, 2023). This is particularly concerning as the region is experiencing rapid demographic changes; the number of people aged 60 years and above has increased by more than 20% in the past five years (National Statistical Office, 2023). Yet, their usage of online ordering services remains limited, partly due to usability challenges and service design mismatches (Worapongpat, 2024).

Drawing from experience in digital literacy programs with local elderly groups, (Sakarin, Prommai, & Marangkun, 2023), the researchers identified critical service design factors such as intuitive navigation, reliable customer support, and strong security assurances as essential for adoption. (Sakarin, Prommai, & Marangkun, 2024). While some studies have examined elderly consumers' online behaviors, research specifically targeting herbal supplement services through Thailand Post remains scarce (Pukahuta, Tanimkarn, & Rodpon, 2022).

To address this gap, the present study applies the Technology Acceptance Model (TAM) and Digital Consumer Behavior frameworks to analyze factors influencing older adults' acceptance of online herbal supplement services. The findings aim to provide practical guidelines for enhancing digital service design and improving access and user experience among Thailand's aging population.

Objective

1. To investigate the personal characteristics and usage behavior of older adults regarding online herbal dietary supplement ordering services.
2. To analyze the factors influencing older adults' acceptance of online services provided by the Thailand Post Company.
3. To propose guidelines for developing the Thailand Post Company's online services to better meet the needs of older adults.

Research Hypotheses

H1: Personal factors (gender, age, education, income) are significantly related to the acceptance of online herbal dietary supplement ordering services.

H2: Perceived ease of use, trustworthiness, system security, and attitude toward use significantly influence the acceptance of such services among older adults.

2. Literature Review

The study of online herbal dietary supplement service acceptance among older adults in Thailand's lower central region requires applying various theories and concepts related to technology adoption, online service usage, and consumer behavior in later life. The relevant theories and research can be grouped into five categories:

The relevant theories and research can be categorized into three main groups:

1. Technology Acceptance Model (TAM). This model is one of the most widely used frameworks for studying technology adoption, particularly in online service contexts. It emphasizes two key determinants: Perceived Ease of Use the belief that using a technology requires minimal effort and Perceived Usefulness the perception that technology improves daily life or helps achieve goals. TAM explains why older adults may hesitate to adopt online services and highlights the importance of simple, need-oriented design in increasing acceptance (Worapongpat & Bhasabutr, 2024).

2. Technology Acceptance Model for the Elderly (TAME). Older adults have unique characteristics compared with younger users, including limited technological experience, higher anxiety about security and privacy, and unfamiliarity with online transactions. TAME focuses on elderly-specific factors such as Information and Support clear guidance and assistance to build confidence and Adaptation for Elderly Users user-friendly features like larger text, audio support, and easy-to-navigate interfaces (Worapongpat & Somchob, 2024).

3. Consumer Behavior Theory. Older adults' purchasing behavior is shaped by age, health, and social change, making adoption of new technologies more complex. Studies indicate that while many older adults are slower to embrace technology, those who are more confident with digital tools are more likely to shop online. Important determinants include Product Knowledge, which strengthens confidence in purchasing herbal supplements, and Satisfaction and Trust, which directly influence repeated usage and acceptance of online services (Worapongpat et al., 2025).

4. Studies on Online Service Usage Behavior of Older Adults. Previous research shows that older adults with prior internet experience are more likely to use online services. Nevertheless, concerns remain about transaction security and fraud. Key factors supporting acceptance include Ease and Convenience of Use preference for simple, intuitive platforms and Security and Safety protection of personal information and secure payment systems (Yanga, Wongkumchai, & Worapongpat, 2023).

5. Studies on Thailand Post. Research on Thailand Post's online services among older adults is still limited. However, its platforms hold potential to address elderly needs, particularly in the herbal dietary supplement sector, which is increasingly popular among older adults as a trusted healthcare option (Yukai, Wongkumchai, & Worapongpat, 2023).

3. Research Framework

The study of online herbal dietary supplement service acceptance among older adults in Thailand's lower central region requires the application of various theories and concepts related to technology adoption, online service usage, and consumer behavior in later life. The relevant theories and research can be grouped into five categories:

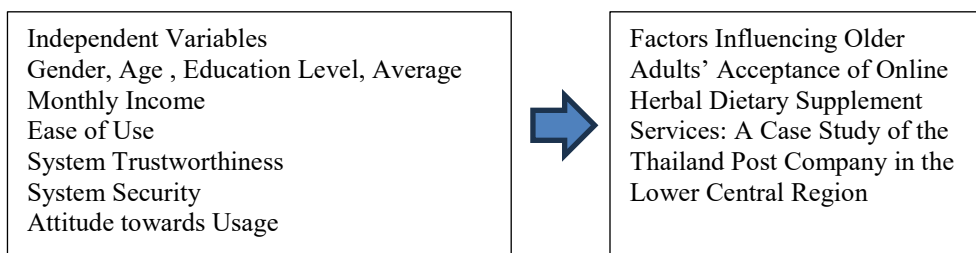


Figure 1 shows the conceptual framework of the research.

4. Methodology

4.1 Research Design

This study employed a mixed-methods design. The quantitative component involved a structured questionnaire to assess levels of service acceptance and associated factors, while the qualitative component consisted of in-depth interviews with selected experts to gain deeper insights into older adults' experiences and challenges.

Population and Sampling The target population comprised residents aged 60 years and above living in Nonthaburi Province who had experience using Thailand Post services. The sample size was determined using Cochran's formula for an unknown population, resulting in a sample of 400 individuals selected through cluster random sampling from six postal branches.

4.2 Research Instruments

A. Quantitative Instrument: Questionnaire

A structured questionnaire was developed to assess the acceptance of online herbal dietary supplement ordering services and relevant influencing factors. The questionnaire was divided into three parts:

Part 1: Demographic information (gender, age, education, income)

Part 2: Likert-scale items measuring perceptions of ease of use, trustworthiness, system security, attitude toward use, and overall acceptance

Part 3: Open-ended questions for additional suggestions

Instrument Quality Assurance:

Reviewed by three experts for content validity using the Index of Item Objective Congruence (IOC), with scores ranging from 0.80 to 1.00 Pilot-tested with 30 non-sample respondents Cronbach's alpha reliability coefficient: 0.95

B. Qualitative Instrument: Structured Interviews

To explore the perceptions and experiences of executives and elderly users, structured interviews were conducted with six key informants. The questions focused on perceptions of ease of use, security, support systems, and suggestions for improving online service delivery. The interviewees were selected using purposive sampling and included post office administrators and senior service users.

4.3 Data Collection

Data were collected over a three-month period (January–March 2025). Quantitative data were obtained through on-site surveys, while qualitative data were collected via face-to-face interviews and voice recordings with informed consent.

4.4 Data Analysis

Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to analyze personal characteristics and acceptance levels.

Inferential statistics included t-tests, one-way ANOVA, and Scheffé's post hoc tests. Pearson's correlation and multiple regression analysis were employed to test relationships and develop predictive models.

5. Results

Table 1 shows the demographic information

The majority were female (53.75%), followed by males (33.75%) and LGBTQ+ (12.5%), indicating that women were the primary user group. In terms of age, 65.75% were between 60 and 65 years old, 25.5% were between 66 and 70 years old, and 8.75% were over 70 years old, indicating that the majority of users were in early adulthood. Education The majority of respondents had at least a high school education (33.75%), followed by those with a bachelor's degree (29.25%), indicating that most users have sufficient educational qualifications to use the online system. In terms of income, 29.75% earned between 20,001

and 30,000 baht per month, 28.0% earned between 10,001 and 20,000 baht per month, and 18.5% earned more than 30,000 baht. These figures reflect purchasing power consistent with the use of online shopping services.

Table 1 Frequency and Percentage of Respondents by Demographic Profile

No.	Demographic Information	Frequency (n)	Percentage (%)
1	Gender		
	- Male	135	33.75
	- Female	215	53.75
	- LGBTQ++	50	12.5
2	Age		
	- 60–65 years	263	65.75
	- 66–70 years	102	25.5
	- Over 70 years	35	8.75
3	Education Level		
	- Elementary School	61	15.25
	- Secondary School	135	33.75
	- Bachelor's Degree	117	29.25
	- Higher than Bachelor's	87	21.75
4	Average Monthly Income (Baht)		
	- Less than 10,000	95	23.75
	- 10,001–20,000	112	28.0
	- 20,001–30,000	119	29.75
	- More than 30,000	74	18.5
	Total	400	100.00

Table 2 presents the analysis of older adults' opinions regarding the online herbal dietary supplement ordering services offered by Thailand Post Company. The overall findings indicate that the level of acceptance was generally high, with users expressing particular satisfaction with ease of use, trustworthiness, and system security.

Table 2 Mean and Standard Deviation of Service Acceptance Factors

Factor	Evaluation Item	Mean	SD	Level of Opinion
1. Ease of Use	The system is easy to use.	3.48	0.98	High
	The usage steps are not complicated.	3.97	0.81	Moderate
	Usage instructions are easy to understand.	3.58	0.79	High
2. Trustworthiness	The system is reliable and stable.	3.69	0.85	High
	Order confirmation is clear.	3.24	0.74	High
	Order status can be tracked.	3.69	0.69	High
3. Security	The system has measures to protect personal data.	3.74	0.72	High
	Online payment through the system is secure.	3.64	0.83	Moderate
	There is a product guarantee or refund policy.	3.57	0.84	High
4. Attitude towards Usage	Users perceive this system as beneficial.	3.67	0.78	High
	The system helps save time and expenses.	3.80	0.77	High
	Users feel satisfied with the usage.	3.71	0.86	High

From Table 2, the following conclusions can be drawn: Ease of Use: Older adults generally found the system user-friendly, with the highest mean score (3.97) reported for the statement “the usage steps are not complicated.” However, this item was classified as moderate based on the cut-off scale, likely due to variability (SD = 0.81). Trustworthiness: Respondents perceived the system as stable and reliable, particularly in tracking order status. Nevertheless, clarity of order confirmation received a slightly lower score (mean = 3.24), indicating a potential area for improvement. Security: Personal data protection was rated highly (mean = 3.74), while online payment security, although positive (mean = 3.64), reflected relatively lower confidence compared to other items. Attitude Toward Usage: Respondents strongly agreed that the system is beneficial, time-saving, and satisfactory, with all items in this category rated at a high level.

Table 3 Relationship between independent variables and service acceptance.

Factor	Dependent Variable	Correlation Coefficient (r)	Significance Level (p-value)	Strength of Relationship
Ease of Use	Service Acceptance	0.511	< 0.05	High Positive Correlation
System Trustworthiness	Service Acceptance	0.362	< 0.05	Moderate Positive Correlation
System Security	Service Acceptance	0.454	< 0.05	Moderate Positive Correlation
Attitude towards Usage	Service Acceptance	0.533	< 0.05	High Positive Correlation

Table 3: Correlation Between Independent Variables and Service Acceptance Interpretation and Explanation

Correlation Coefficient (r): This statistic measures the strength and direction of the linear relationship between two variables, ranging from -1 to 1 . A value closer to 1 indicates a strong positive relationship, while a value closer to -1 indicates a strong negative relationship.

Significance Level (p-value): All variables demonstrated statistically significant relationships with service acceptance at the 0.05 significance level, suggesting that the observed correlations are unlikely to have occurred by chance.

The results show that attitude toward usage ($r = 0.533$) and ease of use ($r = 0.511$) have strong positive correlations with service acceptance. In contrast, system trustworthiness ($r = 0.362$) and system security ($r = 0.454$) exhibit moderate positive correlations. These findings indicate that older adults are more likely to accept online services when they perceive the system as easy to use and beneficial, with trust and security serving as important, though comparatively less influential, factors.

Table 4 Multiple Regression Analysis of Factors Influencing Service Acceptance

Factor	Regression Coefficient (B)	Standard Error (SE)	t-value	Significance Level (p-value)	Standardized Coefficient (Beta)
Ease of Use	0.101	0.191	0.042	< 0.05	0.142
System Trustworthiness	0.239	0.139	0.035	< 0.05	0.152
System Security	0.354	0.112	0.049	< 0.05	0.195
Attitude towards Usage	0.198	0.198	0.428	< 0.05	0.139

Interpretation and Explanation

Regression Coefficient (B): Indicates the expected change in the dependent variable (service acceptance) for a one-unit increase in the respective independent variable, assuming all other variables are held constant.

Standard Error (SE): Reflects the accuracy and stability of the estimated coefficient. A smaller SE suggests a more precise estimate.

t-value and p-value: All independent variables were found to be statistically significant predictors of service acceptance at the 0.05 level, indicating that each contributes meaningfully to the model.

Standardized Coefficient (Beta): Expresses the impact of each variable in standardized terms (z-scores), allowing direct comparison of relative importance.

Based on the study's findings, the following strategic guidelines are proposed to enhance Thailand Post Company's online service delivery, ensuring alignment with the capabilities, limitations, and expectations of older adult users:

1. Prioritize Ease of Use

Simple User Interface (UI) Design: Use large fonts, clear icons, and a clean layout to minimize cognitive overload. Simplify the ordering and payment processes by reducing the number of steps required.

Easy Navigation: Implement intuitive menu structures, avoid technical jargon, and provide step-by-step guidance through user-friendly formats such as images or video tutorials.

Accessibility and Support: Offer multiple support channels, including a dedicated hotline for older users, in-person assistance at post offices, and a responsive online help system.

2. Foster a Positive Attitude Toward Usage

Clear Communication of Benefits: Highlight the convenience, time savings, and safety of online ordering using straightforward language.

Enhance Confidence and Security: Emphasize data privacy, secure payment methods, and provide clear product guarantees and refund policies. Leverage the credibility of Thailand Post as a government agency.

Promote Usage Through Education: Provide hands-on training sessions, online tutorials, and targeted incentives for first-time elderly users.

3. Address Specific Needs and Characteristics of Older Adults

Product Appropriateness: Promote herbal dietary supplements that are trusted and commonly used by older adults.

Flexible Payment Options: In addition to digital payments, offer familiar alternatives such as cash on delivery.

Convenient Delivery Services: Provide a simplified tracking system and offer services such as call-ahead notifications before delivery.

4. Promote Engagement and Social Inclusion

Community Building: Where appropriate, establish an online community platform where older adults can share experiences and seek peer support.

Stakeholder Collaboration: Partner with senior citizen groups, hospitals, and governmental organizations to gather input and co-develop service designs tailored to older adults.

The successful development of online services for older adults should be guided by principles of usability, accessibility, trust, and personalization. Continuous feedback mechanisms are essential to ensure that services evolve in line with user needs.

6. Discussion

The findings from Objective 1 indicate that the majority of older adults who use online herbal dietary supplement ordering services are female, have at least a secondary education, and possess sufficient income for online purchases. This demographic profile, which includes younger seniors (i.e., those under 70 years old) with higher purchasing power, suggests that digital service platforms are currently attracting a more digitally literate and financially capable subgroup of the older population. These findings indirectly resonate with the concept of “digital upgrading” discussed by Zhi Chao et al. (2023), who examined the transformative impact of digital tools on rural production efficiency and employment, though the relevance here is more limited. While our results imply enhanced digital engagement among older adults, they do not directly correspond to the rural economic transformations explored by Zhi Chao et al. Instead, the parallel lies in the broader theme of how digital inclusion creates new opportunities for different societal segments.

Findings from Objective 2 reveal high levels of service acceptance and satisfaction among older adults, particularly regarding ease of use and data security. These results align with Worapongpat et al. (2025), who found that digital marketing efforts significantly improved product visibility, leading to a 35% increase in online sales and greater digital literacy among community members. Although Worapongpat et al. focused on community engagement in digital marketing, both studies underscore the critical role of positive user experiences in promoting technology adoption. The perception of security and simplicity in the online ordering process contributes significantly to older adults’ satisfaction, much like user-friendly digital tools in community settings foster engagement and productivity. These parallels highlight the importance

of designing platforms that are both accessible and trustworthy, thereby reinforcing user confidence.

The results from Objective 3 demonstrate that ease of use and attitude toward usage are significant predictors of older adults' acceptance of online services provided by Thailand Post Company. These findings align with Yanga et al. (2023), who showed that user-generated content—such as positive comments and product images—significantly boosted skincare product sales on the JD e-commerce platform. While the platforms and user demographics differ, the underlying mechanism—building user trust and fostering favorable perceptions—remains consistent. In both cases, a positive service environment, whether achieved through design simplicity or social validation, drives acceptance. This supports the Technology Acceptance Model (TAM), which emphasizes the importance of perceived ease of use and positive attitudes in technology adoption among older adults.

7. Conclusion

The findings of this study indicate that ease of use, system trustworthiness, and system security are statistically significant factors influencing the acceptance of online product ordering services among older adults. These results highlight the importance of designing digital platforms that are intuitive, secure, and capable of building user trust in order to effectively serve the elderly population. In contrast, personal factors such as age, education, and income although traditionally viewed as influential in technology adoption did not show a statistically significant relationship with service acceptance in this study. This suggests that older adults' willingness to adopt online services is more closely linked to their perceptions of the service system itself rather than to their demographic characteristics. These conclusions reinforce the importance of applying user-centered design principles and strengthening system credibility and security when developing digital services for older adult users.

Originality and body of knowledge

This research contributes substantial new knowledge to the field of technology acceptance among Thai older adults, with a specific focus on the use of online herbal dietary supplement ordering services through Thailand Post Company in the Lower Central Region of Thailand. The following key insights extend the existing body of knowledge:

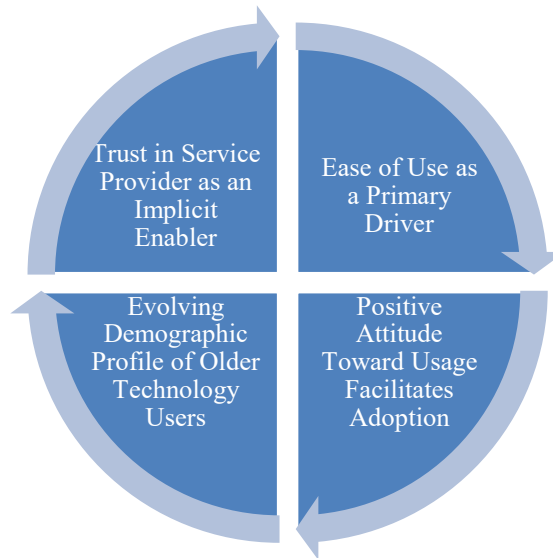


Figure 2 shows the results of the study on technology acceptance in Thai elderly people, focusing specifically on the use of online herbal supplement ordering services via Thailand Post in the lower central region of Thailand.

The study reaffirms that ease of use is not merely a baseline requirement but a critical determinant of older adults' willingness to adopt online services. The findings demonstrate that users highly value straightforward interfaces, clear navigation, and simple, jargon-free language. Collectively, these factors reduce the perceived complexity of technology and foster higher acceptance. Positive Attitude Toward Usage Facilitates Adoption The acceptance of online services is strongly influenced by older adults' attitudes toward technology. When users recognize tangible benefits such as convenience, time savings, and accessibility and feel secure using the system, their likelihood of adoption increases significantly. This finding supports the Technology Acceptance Model (TAM) and underscores the importance of perception-shaping strategies. Evolving Demographic Profile of Older Technology Users Contrary to traditional assumptions, the study reveals that the user base includes not only younger seniors but also older individuals with greater purchasing power. This shift indicates broader and more diverse technological engagement among older adults, underscoring the importance of avoiding stereotypes that portray the elderly as digitally averse or financially constrained. Trust in Service Provider as an Implicit Enabler

Although trust in Thailand Post was not directly measured, the selection of this government-owned and widely respected organization as the service platform suggests that institutional trust plays a critical role in influencing acceptance. Older adults are more likely to adopt services delivered by entities they perceive as reliable and accountable. This study provides empirical evidence that the successful design and deployment of digital services for older adults must be grounded in user-centered design, a positive and supportive user experience, and institutional trust. Moreover, policymakers and service developers should recognize the growing heterogeneity within the older adult population and tailor services accordingly. These insights are particularly valuable for public-sector innovations aimed at reducing digital exclusion among aging populations.

Suggestions

Recommendations Based on Research Findings

1.1 From Objective 1: Older adults using online herbal supplement services are mostly female, educated, and have disposable income.

Suggested Actions: Design marketing strategies targeting older women through accessible media. Offer diverse, high-quality products with clear information. Provide digital literacy training for less tech-savvy users, and collaborate with senior-related organizations to expand outreach.

1.2 From Objective 2: Users are satisfied with ease of use and data security.

Suggested Actions: Maintain and enhance interface simplicity and data protection. Collect feedback through surveys or built-in platform tools. Strengthen user loyalty through promotions and personalized support.

1.3 From Objective 3: Ease of use and attitude strongly influence service acceptance.

Suggested Actions: Design interfaces with large fonts, clear steps, and simple language. Promote the benefits of online services to foster a positive attitude. Provide accessible help channels and step-by-step guidance.

Recommendations for Future Research

Conduct in-depth studies on UX/UI design tailored to older adults. Explore the role of trust and security in digital adoption. Undertake comparative studies across regions or demographic groups. Use longitudinal methods to observe behavioral changes over time.

References

- Euapitaksakul, R., & Benjarongkij, Y. (2023). Causal factors influencing the decision to purchase health products via online channels among Thai elderly. *Journal of Public Relations and Advertising*, 16(2), 29–47. <https://so03.tci-thaijo.org/index.php/jprad/article/view/269795>
- Jaite, P., & Netpradit, N. (2024). Marketing mix, trust, risk perception and the credibility of online product presenters through live streaming that affect the purchase intention of the elderly in Lampang Province. *RMUTL Journal of Business Administration and Liberal Arts*, 12(2), 101–118. <https://so05.tci-thaijo.org/index.php/balajhss/article/view/272974>
- Radsadondeetaechakul, N. (2023). Marketing mix factors affecting online shopping decisions of the elderly in Bangkok. *Santapol College Academic Journal*, 9(1), 128–134. <https://so05.tci-thaijo.org/index.php/scaj/article/view/262336>
- Pukahuta, P., Tanimkarn, P., & Rodpon, P. (2022). Technology acceptance and consumer behavior affecting online purchasing decisions of people entering the aging society in Muang District, Nakhon Ratchasima Province. *University of the Thai Chamber of Commerce Journal Humanities and Social Sciences*, 42(4), 16–35. <https://so06.tci-thaijo.org/index.php/utccjournals/article/view/256471>
- Piwpong, T., & Tancho, N. (2021). Factors influencing decisions to purchase elderly care equipment through electronic commerce systems in Bangkok. *Journal of Management and Marketing, Rajamangala University of Technology Thanyaburi*, 8(2), 60–74. <https://so05.tci-thaijo.org/index.php/mmr/article/view/255111>
- Pinchumpholsang, W., Kongthap, P., Chuendan, B., Jaichuen, P., & Sriin, S. (2022). The elderly's purchasing behavior on online platform. *Journal of Value Chain Management and Business Strategy*, 1(1), 27–36. <https://so08.tci-thaijo.org/index.php/VCMBBS/article/view/394>
- Sakarin, P., Prommai, P., & Marangkun, W. (2023). Trust, price strategies and sales promotion affecting online purchase intention of the elderly in Songkhla Province. *Parichart Journal*, 36(4), 195–212. <https://doi.org/10.55164/pactj.v36i4.265443>
- Sakarin, P., Prommai, P., & Marangkun, W. (2024). Effects of trust and sales promotion on online shopping intentions among elderly consumers in Songkhla Province. *Princess of Naradhiwas University Journal of Humanities and Social Sciences*, 11(1), 120–140. <https://so05.tci-thaijo.org/index.php/pnuhuso/article/view/267606>
- Wiyajroen, A. (2017). Online communication to elderly group. *Siam Communication Review*, 16(20), 76–82. <https://so05.tci-thaijo.org/index.php/commartsreviewsiamu/article/view/172660>
- Worapongpat, N. (2022). Riceberry digital marketing management: Riceberry project community enterprise, Huai Phra Subdistrict, Don Tum District, Nakhon Pathom Province. *RMUTK Journal of Liberal Arts*, 4(2), 77–92. <https://so02.tci-thaijo.org/index.php/larts-journal/article/view/257376>
- Worapongpat, N. (2024). Marketing management and digital marketing of Jasmine rice, Nong Hin Housewives Group, Ratchaburi. *International Journal of Multidisciplinary in Educational & Cultures Studies*, 2(1), 1–14. <https://so04.tci-thaijo.org/index.php/ijec/article/view/270721>
- Worapongpat, N., & Khamcharoen, N. (2024). Development of a digital market management system for community enterprise and professional groups. *Journal of Public and Private Issues*, 1(3), 118–133. <https://so17.tci-thaijo.org/index.php/jppi/article/view/318>
- Worapongpat, N., & Bhasabutr, P. (2024). Community learning for marketing management and digital marketing of Jasmine rice by Nong Hin Housewives Group, Ratchaburi Province. *Journal of Education and Learning Reviews*, 1(5), 57–70. <https://doi.org/10.60027/jelr.2024.848>
- Worapongpat, N., & Somchob, P. (2024). Participatory community learning to develop a digital market management system for community enterprises and stable occupation groups: Nam Phrik Kaeng Krua Khanong, Song Khanong Subdistrict, Sam Phran District, Nakhon Pathom Province. *Journal of Education and Learning Reviews*, 1(6), 61–74. <https://doi.org/10.60027/jelr.2024.847>
- Worapongpat, N., Chaiwiwat, U., Thavisin, N., & Sun, Q. (2025). Learning management in innovative communities for marketing and digital marketing of agricultural products: A case study of date palm products, Rai Sukjai Project, Ban Hao, Ratchaburi Province. *Journal of Education and Learning Reviews*, 2(1), 69–82. <https://doi.org/10.60027/jelr.2025.853>
- Yanga, L., Wongkumchai, T., & Worapongpat, N. (2023). The impact of online word-of-mouth from multi-platform on product sales. *UBRU International Journal*, 3(3), 55–70. <https://so04.tci-thaijo.org/index.php/ubruj/article/view/269847>
- Yukai, S., Wongkumchai, T., & Worapongpat, N. (2023). The marketing strategy of financial holding company in the digital era on customer satisfaction: A case study of a financial holding company in China. *International Journal of Multidisciplinary in Educational & Cultures Studies*, 1(3), 21–34. <https://so04.tci-thaijo.org/index.php/ijec/article/view/267554>
- Zhi Chao, H., Wongkumchai, T., & Worapongpat, N. (2023). Rural digital model for upgrading a rural area to an efficient digital society: A case study of SMEs in Urumqi, China. *International Journal of Multidisciplinary in Educational & Cultures Studies*, 1(3), 35–55. <https://so04.tci-thaijo.org/index.php/ijec/article/view/268211>