

The Mediating Role Of Perceived Usefulness In Investigating The Impact Of Catalysts On The Adoption Of Self-Service Technologies (Ssts) By Elderly Patrons In Restaurants: A Conceptual Paper

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Structured Abstract

Purpose: This conceptual paper examines the mediating role of perceived usefulness in understanding how catalysts namely convenience, cost saving, time efficiency, and health and safety concerns influence the adoption of Self-Service Technologies (SSTs) among elderly patrons in restaurants. The study addresses the gap in hospitality literature regarding elderly consumers' technology adoption, focusing on their unique motivations and constraints in an increasingly digital dining environment.

Design/methodology/approach: Drawing on the Technology Acceptance Model (TAM) and related extensions, this study develops a conceptual framework that positions perceived usefulness as the mediating variable between catalysts and SST adoption intentions. A systematic review of literature in hospitality, tourism, gerontechnology, and technology adoption informs the hypotheses development. The framework highlights how elderly patrons evaluate convenience, cost saving, time efficiency, and health and safety concerns in shaping perceptions of usefulness, which subsequently determine their adoption of SSTs.

Findings: The proposed framework suggests that perceived usefulness is central to explaining elderly patrons' willingness to adopt SSTs in restaurant contexts. Specifically, the four catalysts - convenience, cost saving, time efficiency, and health and safety concerns are theorized to have positive impacts on perceived usefulness, which in turn significantly drives adoption intentions.

Originality/value: This paper contributes to hospitality technology adoption research by focusing on elderly patrons, an underexplored yet rapidly growing market segment. It extends the TAM framework by integrating practical and health-related catalysts that reflect elderly consumers' priorities. The study offers theoretical insights into the mediating role of perceived usefulness, while also highlighting practical strategies for designing inclusive, elderly-friendly digital service ecosystems in restaurants.

Practical implications: The conceptual framework provides actionable strategies for restaurant operators seeking to improve SST adoption among elderly patrons. By ensuring that SSTs deliver clear convenience, measurable cost savings, time efficiency, and enhanced health and safety, managers can strengthen perceived usefulness and thereby encourage adoption. These insights support the creation of safer, more efficient, and more inclusive hospitality environments for elderly consumers.

Keywords: Self-service technologies, elderly patrons, perceived usefulness, catalysts, adoption

INTRODUCTION

The rapid diffusion of Self-Service Technologies (SSTs) has transformed the hospitality and restaurant industry, reshaping how customers order, pay, and interact with service providers. From self-ordering kiosks to mobile applications and contactless payment systems, SSTs have become central to modern dining (Gursoy et al., 2019). While existing literature highlights convenience, efficiency, and autonomy, growing concern exists over how elderly patrons engage with these technologies. With global demographic shifts toward aging populations, ensuring elderly inclusion in technology-driven service environments is both an ethical and strategic necessity (Kim et al., 2021; Sun & Zhang, 2022).

Restaurants increasingly deploy SSTs to cut costs, overcome labor shortages, and appeal to younger, tech-

savvy consumers (Collier & Kimes, 2013). However, elderly patrons often face barriers such as limited digital literacy, physical constraints (e.g., vision, dexterity), and apprehensions about security or reliability (Chen & Chan, 2014; Marikyan et al., 2022). Despite these challenges, older individuals are not inherently resistant to technology. Their adoption behavior depends on Perceived Usefulness (PU), shaped by catalysts such as convenience, cost saving, time efficiency, and health and safety concerns (Mhlana, 2023).

Technology acceptance research has been grounded in the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Both frameworks emphasize PU as a determinant of behavioral intention. Yet, traditional models may not fully capture the unique motivations of elderly patrons in restaurant contexts (Laukkanen et al., 2007). In this demographic, catalysts such as convenience and efficiency play a stronger role, while health and safety concerns—especially in the wake of COVID-19 directly influence PU and, subsequently, SST adoption (Chong et al., 2020; Zhou et al., 2022).

Although hospitality literature on SST adoption has largely focused on general consumers, elderly patrons represent a growing and underserved market segment (Statista, 2023). Their engagement with SSTs influences restaurant competitiveness, inclusivity, and customer satisfaction (Li & Wang, 2022). As SST adoption accelerates post-pandemic (Nam et al., 2021), understanding elderly adoption behavior becomes more urgent. Well-designed SSTs offer opportunities to enhance autonomy, convenience, and perceived safety for this group (Fan et al., 2022; Lankton et al., 2022).

This conceptual paper proposes a framework where PU mediates the effects of four catalysts - convenience, cost saving, time efficiency, and health and safety concerns on elderly patrons' adoption of SSTs in restaurants. PU acts both as a filter that translates catalysts into adoption outcomes and as a bridge connecting utilitarian benefits with the intention to adopt (Venkatesh et al., 2012; Yang et al., 2022).

The paper is structured as follows: objectives and questions clarify the study's aims; the literature review synthesizes prior studies; hypotheses formalize the conceptual model; theoretical perspectives highlight TAM, UTAUT, and gerontechnology frameworks; the methods section outlines the research design; and the discussion and conclusion present implications, limitations, and future directions (Marikyan et al., 2022; Kim et al., 2021).

By situating elderly patrons within the broader discourse on technology adoption, this paper advances understanding while offering practical insights. It emphasizes how restaurants can promote inclusiveness in technological innovations, ensuring elderly patrons are not marginalized in the transition to SST-driven hospitality (Sun & Zhang, 2022).

Research Objectives

To analyze the effect of catalysts (convenience, cost saving, time efficiency, and health & safety concerns) on the adoption of SSTs in restaurants.

To determine the effect of these catalysts on perceived usefulness in restaurants.

To explore the effect of perceived usefulness on elderly patrons' adoption of SSTs in restaurants.

To examine the indirect effect of catalysts on SST adoption through perceived usefulness.

Research Questions

What is the effect of catalysts (convenience, cost saving, time efficiency, and health & safety concerns) on the adoption of SSTs in restaurants?

What is the effect of these catalysts on perceived usefulness in restaurants?

What is the effect of perceived usefulness on SST adoption among elderly patrons?

Do catalysts indirectly influence SST adoption through perceived usefulness?

LITERATURE REVIEW

The rapid rise of Self-Service Technologies (SSTs) such as kiosks, QR menus, and mobile apps is reshaping restaurant service by enhancing efficiency, lowering labor costs, and improving customer experiences. Yet, adoption among elderly patrons remains inconsistent due to varying digital literacy, physical limitations, and differing perceptions of value. The Technology Acceptance Model (TAM) highlights Perceived Usefulness (PU) and ease of use as central adoption drivers, with PU particularly crucial for elderly users who prioritize functional benefits over novelty.

Convenience plays a vital role by reducing physical effort, simplifying ordering, and lessening cognitive load.

Empirical findings show convenience enhances PU, thereby supporting adoption. Cost saving is another catalyst, as elderly consumers often value discounts, loyalty rewards, and reduced transaction costs, which strengthen perceptions of usefulness. Time efficiency also matters SSTs that shorten queues and speed up transactions are especially beneficial for older patrons who prefer predictable, low-effort dining experiences. Health and safety concerns, heightened since COVID-19, further motivate elderly adoption. Contactless ordering reduces exposure to shared surfaces and staff interaction, reinforcing perceived safety and usefulness. Overall, PU mediates the influence of these catalysts, underscoring its central role in shaping elderly patrons' willingness to adopt SSTs in restaurants.

Hypothesis Development

Hypothesis 1: Convenience and SST Adoption

Convenience is a pivotal catalyst influencing elderly patrons' adoption of self-service technologies (SSTs) in restaurants. Given age-related limitations such as reduced mobility, slower reaction times, and lower dexterity, systems that streamline ordering and minimize effort are highly appealing. SSTs (e.g., kiosks, QR menus) eliminate unnecessary movement, reduce reliance on staff, and enable self-paced interaction.

Research supports this: Collier and Kimes (2013) found that ease and efficiency of SST interfaces enhance service satisfaction, while Nguyen et al. (2022) showed a strong link between perceived convenience and adoption intentions among elderly users. In gerontechnology, user-friendly features (e.g., large icons, simple menus) improve control and reduce anxiety—core aspects of convenience. Thus:

H1: Convenience has a significant positive effect on the adoption of self-service technologies (SSTs) in restaurants.

Hypothesis 2: Cost Saving and SST Adoption

Elderly consumers often operate within limited incomes, making perceived economic benefits crucial. Cost-saving features—such as lower prices from reduced labor costs, app-exclusive promotions, or loyalty discounts—signal tangible value. SSTs may also reduce fees or expedite transactions, reinforcing perceived financial benefit.

Although research on elderly SST adoption and cost saving is emerging, broader studies confirm its importance. Gong et al. (2020) found cost reduction predicts mobile shopping adoption among older adults, while Luo et al. (2023) reported financial incentives boost engagement with contactless payments. Seniors, who prioritize value over novelty, are particularly sensitive to cost savings.

H2: Cost saving has a significant positive effect on the adoption of self-service technologies (SSTs) in restaurants.

Hypothesis 3: Time Efficiency and SST Adoption

Time efficiency is another key determinant of SST adoption. Many elderly diners prefer minimal waiting and predictable service, especially those with health conditions that make queues difficult. SSTs enable quicker ordering, faster payment, and smoother throughput, reducing physical strain and mental fatigue.

Shankar et al. (2022) showed perceived time savings strongly influence older users' adoption of digital self-checkout systems. Similarly, Lee et al. (2021) reported time-saving features as highly valued in hospitality SSTs. For seniors, these efficiencies reinforce autonomy and encourage adoption.

H3: Time efficiency has a significant positive effect on the adoption of self-service technologies (SSTs) in restaurants.

Hypothesis 4: Health and Safety Concerns and SST Adoption

Health and safety concerns have become critical motivators since COVID-19, especially among elderly populations at higher risk. SSTs promote contactless interaction: users avoid shared objects (e.g., pens, menus), minimize staff contact, and often use sanitized or touchless screens lowering exposure risk.

Shin et al. (2023) found perceived health benefits increased elderly diners' trust and intention to use SSTs, while Al-Ansi et al. (2021) reported hygiene-related motivations as key to digital ordering adoption. For older adults, reduced risk makes SSTs especially attractive.

H4: Health and safety concerns have a significant positive effect on the adoption of self-service technologies (SSTs) in restaurants.

Hypothesis 5: Perceived Usefulness as Mediator

While the above hypotheses suggest direct effects, these catalysts may operate largely through Perceived

usefulness (PU) a central TAM construct. PU reflects the extent to which individuals believe SSTs improve their dining experience. Elderly patrons, often risk-averse and utility-driven, are more likely to adopt SSTs when they perceive clear benefits.

Evidence highlights PU's mediating role. Venkatesh et al. (2012) and Kim and Qu (2020) show that adoption is often routed through PU. Nguyen et al. (2022) found service convenience boosted SST intention mainly by enhancing PU, while Shin et al. (2023) reported safety concerns worked similarly. Thus:

H5: Perceived usefulness mediates the relationships between convenience, cost saving, time efficiency, and health and safety concerns, and the adoption of Self-Service Technologies (SSTs) in restaurants.

This mediation framework underscores PU's cognitive filter function: catalysts drive positive outcomes more effectively when they enhance elderly patrons' perceived value of SSTs. Confirming mediation offers theoretical insights into how utilitarian and experiential drivers work through PU, while guiding restaurateurs in designing systems tailored to seniors' needs.

Proposed Conceptual Model

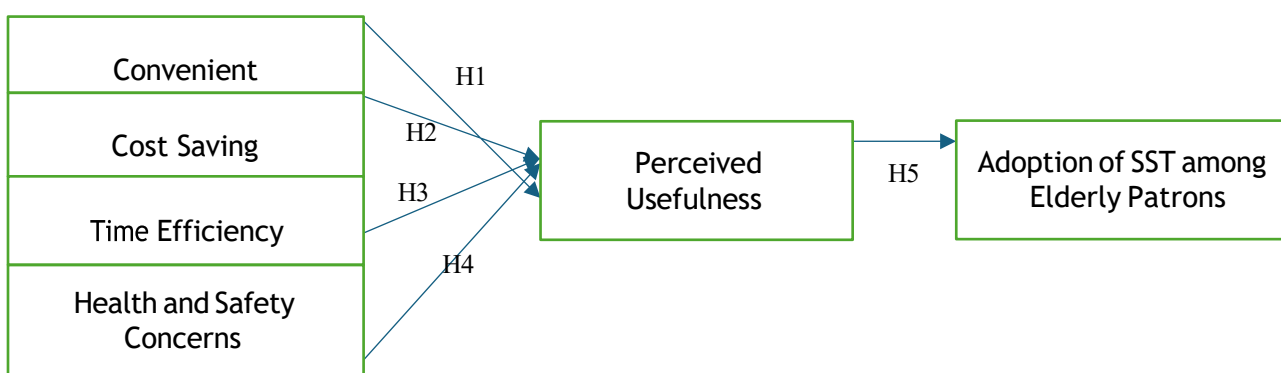


Figure 1: Proposed Conceptual Model

Theoretical Perspective

The adoption of Self-Service Technologies (SSTs) by elderly patrons in restaurants can be explained through the Technology Acceptance Model (TAM) (Davis, 1989) and its extensions. TAM posits that two main beliefs—perceived ease of use and perceived usefulness—determine an individual's intention to use a new technology. Among these, Perceived Usefulness (PU) consistently emerges as the strongest predictor of technology adoption, especially in contexts where utilitarian outcomes such as efficiency, cost savings, and safety are valued (Venkatesh & Davis, 2000; Venkatesh et al., 2012).

In this study, perceived usefulness is positioned as the mediating construct through which catalysts such as convenience, cost saving, time efficiency, and health and safety concerns influence SST adoption. This perspective aligns with the argument that elderly users are more likely to embrace technology when they clearly perceive tangible benefits that improve their dining experience. For instance, convenience and time efficiency reduce physical effort and waiting time, which in turn enhances the perception that SSTs are useful. Similarly, cost saving provides financial advantages that resonate with elderly patrons often living on fixed incomes, while health and safety concerns heightened in the post-pandemic era reinforce the usefulness of contactless ordering systems (Shin et al., 2023).

The integration of these catalysts into TAM provides a more nuanced lens tailored to elderly consumers in the hospitality sector. It also resonates with the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasizes performance expectancy (similar to PU) as a key determinant of adoption (Venkatesh et al., 2003). By conceptualizing PU as a mediator, this study addresses calls for refining TAM to capture how contextual factors shape adoption indirectly (Nguyen et al., 2022; Luo et al., 2023).

Therefore, the theoretical perspective of this research highlights that while convenience, cost saving, time efficiency, and safety directly encourage adoption, their true impact unfolds through enhancing perceived usefulness. This positions PU as the central cognitive mechanism that explains why elderly patrons ultimately decide to adopt SSTs in restaurants.

METHOD

This study will employ a quantitative research design using surveys as the main data collection method. A quantitative approach will be appropriate as it will enable hypothesis testing through measurable data and statistical analysis (Creswell & Creswell, 2018). Surveys will allow structured and standardized responses from a large sample, ensuring comparability and reliability. Since the study will investigate the mediating role of Perceived Usefulness (PU) between catalysts and the adoption of Self-Service Technologies (SSTs) among elderly patrons, quantitative analysis will be best suited to examine both direct and indirect effects.

The target population will consist of elderly patrons aged 60 years and above who dine in casual dining restaurants in Malaysia. This demographic will be selected because older adults face unique challenges in technology adoption yet represent a growing customer segment in hospitality (Shin et al., 2023). A purposive sampling strategy will be applied, ensuring participants will have experience or exposure to SSTs such as self-ordering kiosks, QR ordering, or restaurant mobile applications.

To ensure reliable results, a minimum of 300 responses will be targeted, following recommendations for structural equation modeling (SEM) (Kline, 2016). Recruitment will take place at casual dining restaurants using SSTs, through elderly community groups, and online senior networks.

Data will be gathered via a structured questionnaire administered in both face-to-face and online formats. Items will measure the four catalysts (convenience, cost saving, time efficiency, and health & safety concerns), PU, and intention to adopt SSTs, using a five-point Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”). Scales will be adapted from prior validated studies (Davis, 1989; Venkatesh et al., 2003; Luo et al., 2023). A pilot test with 30 elderly patrons will be conducted to refine wording and confirm clarity.

Ethical considerations will be strictly followed. Participants will be informed of the study’s purpose, assured of confidentiality, and asked for consent. No personal identifiers will be collected, and participants will be allowed to withdraw at any stage.

Data will first be screened for missing values, outliers, and normality. Descriptive statistics will be used to summarize demographics. SEM will serve as the primary analysis method, as it will allow simultaneous testing of direct, indirect, and mediating effects (Hair et al., 2022). Regression analysis will provide additional validation if SEM assumptions are unmet.

Mediation analysis will test whether PU mediates the relationship between the four catalysts and adoption of SSTs. Bootstrapping will be applied to assess the significance of indirect effects, following Hayes (2018). Results will then be interpreted considering existing theory and prior research on technology adoption in hospitality and aging populations.

DISCUSSION

This study is expected to show that catalysts - convenience, cost saving, time efficiency, and health and safety concerns significantly influence the adoption of Self-Service Technologies (SSTs) among elderly patrons in Malaysian casual dining restaurants, with Perceived Usefulness (PU) serving as a key mediator.

Convenience and time efficiency are anticipated to emerge as the strongest predictors. Elderly patrons are likely to appreciate SSTs that reduce physical effort, simplify ordering, and shorten waiting times. This aligns with prior findings suggesting that ease and speed of service strongly drive SST acceptance (Collier & Kimes, 2013; Gursoy et al., 2019).

Cost saving is also expected to positively influence adoption, though less strongly. Seniors, being financially cautious, may be motivated by discounts, loyalty rewards, and special promotions available through SSTs, consistent with research highlighting financial benefits as important for older consumers’ decision-making (Gao & Bai, 2014).

Health and safety concerns are projected to be especially influential in the post-COVID-19 era. Elderly patrons are expected to view SSTs as safer alternatives by minimizing direct contact and reducing exposure to shared surfaces, reinforcing contactless service as a long-term driver of adoption (Kabadayi et al., 2020).

Perceived usefulness is expected to play a central mediating role. In line with the Technology Acceptance Model (Davis, 1989; Venkatesh et al., 2003), catalysts are likely to exert stronger effects on adoption when elderly patrons perceive SSTs as genuinely enhancing the dining experience. Functional features such as convenience or hygiene may translate into adoption only if seniors find them useful for improving service quality.

Theoretically, these expected results would extend TAM by incorporating elderly-specific catalysts such as health concerns and demonstrating their indirect effects through PU. Practically, they would suggest that restaurants should emphasize clarity, accessibility, and reliability in SST design, highlight tangible benefits such as time savings and hygiene, and provide initial staff support to reduce anxiety and foster adoption among elderly patrons.

CONCLUSION

This study is expected to demonstrate that catalysts - convenience, cost saving, time efficiency, and health and safety concerns will significantly shape elderly patrons' adoption of Self-Service Technologies (SSTs) in Malaysian casual dining restaurants. Among these, convenience and health concerns are anticipated to emerge as the strongest drivers, reflecting seniors' preference for functional ease and reassurance of safety in their dining experiences.

Perceived usefulness is also expected to play a central mediating role. Elderly patrons are likely to adopt SSTs when they perceive them as genuinely valuable and service-enhancing. This suggests that designing SSTs to highlight clear and practical benefits will align better with elderly users' priorities, rather than framing them simply as innovative tools.

From a theoretical standpoint, the study is expected to extend the Technology Acceptance Model (TAM) by incorporating elderly-specific catalysts and showing how these factors operate through perceived usefulness to influence adoption. From a practical perspective, restaurants should ensure SSTs are intuitive and accessible, emphasize time-saving and health-related features, and offer modest cost incentives that appeal to seniors' cautious spending habits.

Although elderly patrons may adopt technology more gradually than younger consumers, it is expected that they will be receptive when SSTs are positioned as useful, safe, and convenient. As populations continue to age, the hospitality sector will need to adapt by embedding inclusive technologies that enhance both service efficiency and seniors' independence in dining.

Future research could expand on this conceptual framework by examining cultural variations, tracking elderly adoption patterns over time, and integrating psychological constructs such as trust, risk perception, and digital self-efficacy. These directions would strengthen understanding and support sustainable strategies for promoting SST adoption in aging societies.

Reference List

- Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences*, 30(2), 361–391. <https://doi.org/10.1111/j.1540-5915.1999.tb01614.x>
- Amiri, F., Shishan, F., Bazi, S., Nimri, R., & Obeidat, Z. (2025). Examining customers' continuous intention to use self-service kiosks: An extended approach in the context of fast food restaurants using the technology readiness index and technology acceptance model. *Journal of Consumer Behaviour*. Advance online publication. <https://doi.org/10.1002/cb.2197>
- Blut, A., Wang, C., & Schoefer, H. (2016). Factors influencing the acceptance of self-service technologies: A meta-analysis. *Journal of Service Research*, 19(4), 396–416. <https://doi.org/10.1177/1094670516662352>
- Chen, M., & Chan, A. H. S. (2022). Gerontechnology acceptance by older adults in Hong Kong. *Behaviour & Information Technology*, 42(16), 1–19. <https://doi.org/10.1080/0144929X.2022.2081057>
- Chen, Y., Wang, L., & Yu, J. (2021). Digital inclusivity in service environments: Elderly customers and self-service technology. *The Service Industries Journal*, 41(9–10), 629–651. <https://doi.org/10.1080/02642069.2020.1736127>
- Chung, H., & Park, W. (2021, May). Enhancing the usability of self-service kiosks for older adults: Effects of using privacy partitions and chairs. *arXiv*. <https://arxiv.org/abs/2105.00000>
- Collier, A., & Kimes, M. (2013). Only if it is convenient: Understanding how convenience influences self-service technology evaluation. *Journal of Service Research*, 16(1), 39–51. <https://doi.org/10.1177/1094670512458454>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Davis, R. A., & Garcia, M. (2022). The aging consumer and digital inclusion: A critical review. *Journal of Aging Studies*, 62, 100955. <https://doi.org/10.1016/j.jaging.2022.100955>
- García-Méndez, S., de Arriba-Pérez, F., González-Castaño, F. J., Regueiro-Janeiro, J. A., & Gil-Castiñeira, F. (2024, March). Entertainment chatbot for the digital inclusion of elderly people without abstraction capabilities. *arXiv*. <https://arxiv.org/abs/2403.00000>
- Gursoy, L., Chi, S., & Karadag, A. (2021). Generational differences in hospitality technology adoption: COVID-19 as a catalyst. *International Journal of Hospitality Management*, 98, 103050. <https://doi.org/10.1016/j.ijhm.2021.103050>

- Hoque, A., & Sorwar, G. (2017). Understanding factors influencing the adoption of mHealth by the elderly: An extension of the UTAUT model. *International Journal of Medical Informatics*, 101, 75–84. <https://doi.org/10.1016/j.ijmedinf.2017.02.002>
- Jang, E., & Cho, M. (2024). Restaurant senior diners' self-service technology adoption: Applying technology acceptance model (TAM) and senior technology exploration, learning and acceptance model (STELA). *Foodservice Management Society of Korea*, 27(4), 113–130. <https://doi.org/10.47584/2024.27.4.113>
- Karahanna, H., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23(2), 183–213. <https://doi.org/10.2307/249751>
- Lee, H. J., & Lyu, J. (2019). Exploring factors which motivate older consumers' self-service technologies (SSTs) adoption. *International Review of Retail, Distribution and Consumer Research*, 29(2), 218–239. <https://doi.org/10.1080/09593969.2018.1562954>
- Lee, J. (2025). Exploring consumers' technology acceptance behavior regarding indoor smart farm restaurant systems: Focusing on the value-based adoption model and value–attitude–behavior hierarchy. *Systems*, 13(3), 189. <https://doi.org/10.3390/systems13030189>
- Marangunić, M., & Granić, A. (2015). Technology acceptance model: A literature review from 1986 to 2013. *Universal Access in the Information Society*, 14(1), 81–95. <https://doi.org/10.1007/s10209-014-0348-1>
- Min Teh, H., Leow, M. C., & Ong, L. Y. (2024, June). Factors influencing the behavioral intention of elderly toward self-ordering kiosks. In *Proceedings of the 21st International Joint Conference on Computer Science and Software Engineering (JCSSE)* (pp. 1–6). IEEE. <https://doi.org/10.1109/JCSSE61278.2024.10613703>
- Nam, J., & Kim, S. (2023). Elderly users' emotional and behavioral responses to self-service technology in fast-food restaurants. *Behavioral Sciences*, 13(4), 284. <https://doi.org/10.3390/bs13040284>
- Olivar, K. G. (2025). Modelling self-service technology quality, acceptance and customer delight toward sustainable practices in fast-food kiosk use. *African Journal of Hospitality, Tourism and Leisure*, 14(2), 259–273. <https://doi.org/10.46222/ajhtl.19770720.415>
- Park, J., Kim, D., & Hyun, H. (2021). Understanding self-service technology adoption by 'older' consumers. *Journal of Services Marketing*, 35(1), 78–97. <https://doi.org/10.1108/JSM-02-2019-0072>
- Rahardjo, A. D. K., Kusumawati, A., & Sunarti, S. (2024). The role of perceived usefulness of self-service technology on behavioral intention among older adults. In *KNE-Social. Knowledge E*. <https://doi.org/10.18502/kss.v8i1.10001>
- Rahardjo, A. D. K., Kusumawati, A., & Sunarti, S. (2024). Perceived usefulness more important than ease of use in increasing behavioral intention to use SST among older individuals. In *KNE-Social. Knowledge E*. <https://doi.org/10.18502/kss.v8i2.10002>
- Rahi, N. (2017). A structural model of self-service technology (SST) service quality, customer satisfaction and loyalty. *International Journal of Technology Enhanced Learning, Innovation and Development*, 9(2), 92–115. <https://doi.org/10.1504/IJTLID.2017.084123>
- Shandilya, E., & Fan, M. (2022, October). Understanding older adults' perceptions and challenges in using AI-enabled everyday technologies. *arXiv*. <https://arxiv.org/abs/2210.00000>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Yap, Y.-Y., Tan, S.-H., & Choon, S.-W. (2022). Elderly's intention to use technologies: A systematic literature review. *Heliyon*, 8(1), e08765. <https://doi.org/10.1016/j.heliyon.2021.e08765>
- Zhang, P. (2004). Motivational affordances: Reasons for ICT design and use. *Communications of the ACM*, 47(11), 145–147. <https://doi.org/10.1145/1035134.1035172>