Customer Satisfaction in Smart Home Appliances: Exploring Consumer Behavior of Housewives in Melaka

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ABSTRACT

The adoption of smart home appliances has transformed household chores, offering enhanced convenience and efficiency. This study explores consumer behaviour among housewives in Melaka regarding the use of smart home appliance, with a focus on understanding factors that influence customer satisfaction. As smart home appliances integrate advanced technologies such as automation, remote control, and energy efficiency, it is essential to examine how housewives perceive and interact with these appliances. The study assesses the level of adoption, key determinants of satisfaction, and the overall impact of smart home appliance on daily household tasks. A descriptive research design and a quantitative research method were employed, utilizing a structured questionnaire distributed to 134 housewives in Melaka. Data collection and analysis were conducted using the Statistical Package for the Social Sciences (SPSS) Version 27. The research investigates the relationship between perceived ease of use, usefulness, cost, and customer satisfaction. Findings from this study provide insights into how smart home appliances influence consumer experiences, guiding manufacturers and marketers in improving product design, usability, and customer support services. By aligning smart appliance features with the specific needs and expectations of housewives, businesses can enhance customer satisfaction and promote the widespread adoption of smart home technologies.

Keyword: new technology, smart home appliances, customer satisfaction, technology adoption

INTRODUCTION

In today's fast-paced world, smart home technology has revolutionized household chores, particularly for housewives who manage multiple responsibilities. Among essential appliances, smart washing machines have emerged as innovative solutions, offering features such as remote control, energy efficiency, and integration with smart home ecosystems (Hong et al., 2022; Oluwafemi Michael, 2024). Understanding consumer behaviour is crucial for manufacturers and marketers seeking to enhance customer satisfaction, as purchasing decisions are influenced by factors like brand trust, convenience, and value (Schiffman & Wisenblit, 2019; Solomon, 2018).

Housewives represent a significant consumer segment in the smart home appliance market, with distinct preferences shaped by their household management roles (Smith, Johnson, & Williams, 2023; Ellis et al., 2021). Customer satisfaction, a key metric for brand loyalty and repeat purchases, depends on how well products meet user expectations (Derek Orgood, 2024; Kumar et al., 2024). Smart home appliance, equipped with internet connectivity and automated functions, offer enhanced efficiency and convenience, influencing consumer behavior and satisfaction (Wang & Zhang, 2018; Smith & Brown, 2019).

This study explores the relationship between consumer behaviour and satisfaction among housewives using smart washing machines, aiming to identify key factors that manufacturers can address to improve product offerings and user experience. By analysing purchasing patterns and usage behaviours, the research provides insights into optimizing smart home appliances to better meet consumer needs.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This chapter reviews existing literature on consumer behaviour and customer satisfaction in the context of smart home technology, particularly smart washing machines among housewives. It explores key theories, influencing factors, and previous research to establish a foundation for understanding how consumer behaviour impacts satisfaction.

Consumer Behaviour and Technology Adoption

Consumer behaviour in technology adoption is influenced by perceived usefulness (PU) and perceived ease of use (PEOU), as outlined in the Technology Acceptance Model (TAM) (Davis, 1989). Housewives adopt smart washing machines based on their ability to enhance convenience and efficiency (Wong & Lee, 2023). Cultural norms, social influences, personal preferences, and psychological factors all shape their purchasing decisions (Garcia & Nguyen, 2022; Roberts & Thompson, 2023; Chen & Davis, 2023).

This study applies the TAM framework, where smart home appliances features such as energy efficiency, automation, and cleaning performance serve as independent variables influencing customer satisfaction (Davis, 1989). Research suggests that smart home appliances are more readily adopted when users find them useful and easy to operate (Smith et al., 2023).

Previous Studies

Existing research highlights the role of PU and PEOU in shaping consumer attitudes toward smart home technology. PU is linked to time savings, automation, and improved laundry efficiency, which contribute to satisfaction (Lim & Ting, 2022; Lee & Park, 2021). PEOU, referring to the simplicity of using smart washing machines, enhances adoption and continued usage (Smith, Johnson, & Brown, 2023; Venkatesh & Bala, 2021). User-friendly interfaces and seamless integration with other smart home systems further influence consumer preferences (Lee & Park, 2022).

Perceived Usefulness in Smart Home Technology

Perceived Usefulness (PU) refers to how a technology enhances task efficiency, making daily chores easier. In the context of smart home appliances, PU is linked to time savings, reduced effort, and improved cleaning quality. Research by Smith, Johnson, and Williams (2023) indicates that consumers are more satisfied when smart home appliances improve convenience and efficiency. Lim and Ting (2022) further emphasize that functionality and resource savings enhance PU, influencing user acceptance. Lee and Park (2021) highlight those advanced features such as remote control, energy efficiency, and integration with smart home systems significantly enhance user satisfaction and overall convenience.

Perceived Ease of Use in Smart Home Technology

Perceived Ease of Use (PEOU) is a key component of the Technology Acceptance Model (TAM) that influences technology adoption. In the context of smart home appliance, PEOU refers to the belief that these appliances are effortless to operate. Smith, Johnson, and Brown (2023) highlight that ease of use significantly impacts consumer satisfaction and adoption, particularly among housewives. Lee and Park (2022) emphasize that user-friendly interfaces and straightforward functionality enhance satisfaction and encourage continued use. Lim and Ting (2022) further support this, finding that consumers prefer smart washing machines that are easy to navigate. Additionally, Venkatesh and Bala (2021) assert that PEOU positively influences user attitudes and behavioural intentions toward adopting smart home appliances, including washing machines.

Customer Satisfaction in Smart Home Technology

Customer satisfaction is a key factor influencing consumer loyalty and business sustainability in the smart home technology industry. Jones and Smith (2023) define it as an emotional response or perception of a product's effectiveness. In the context of smart home appliances, satisfaction is crucial for ensuring repeat purchases and long-term consumer trust. Miller and Davis (2023) highlight that satisfied customers contribute to a company's

financial stability by fostering brand loyalty. When smart home devices, such as smart washing machines, meet user expectations, customers are more likely to continue using the brand and explore other smart home products.

Research Framework

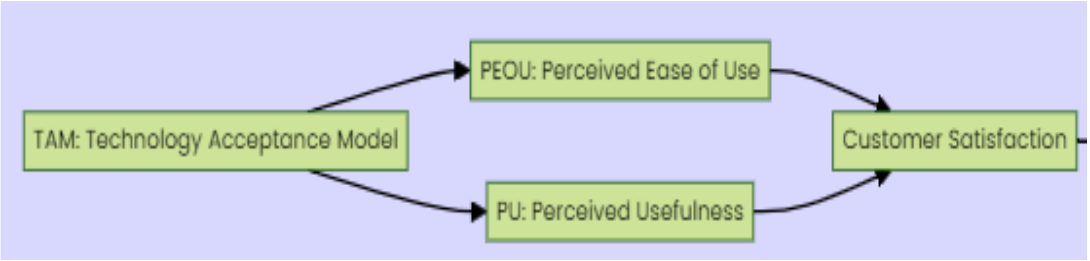

Figure 3.1 Conceptual Framework of the Research

METHODOLOGY

This study employed a quantitative research approach, utilizing questionnaire survey. This study was conducted on 132 respondents of Smart Home Appliances in Malaysia who use self-service systems. There are 3 sections in the questionnaire form which are Section A, Section B, and Section C. Section A will emphasis on the general information of respondents. In Section B, the questions will relate to the independent variables such as Perceive ease of use, and Perceive of usefulness which are important to the use of Smart Home Appliances. While Section C will focus on the dependent variable which is Intention of using the self-service technology in quick service restaurant from the point of respondents' view. This survey form is created with the aim of address and achieve all the research questions and research objectives, was thus set based on the past study by other researchers. The study employed measurement scales that have been previously validated in existing literature. The survey instrument for efficiency is based on constructs validated in studies by Dabholkar & Bagozzi, 2002). While the instruments for perceived of use was adopted by (Carran, 2003). Besides, perceived of usefulness were adopted from (Cho, 2011; Liu, Huang, and Chiou, 2012; Esman et al., 2010). A five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), was utilized. The collected data underwent processing using SPSS version 27, involving descriptive statistics, reliability and validity analysis, Pearson correlation, and multiple regression tests to address the objectives of this study.

Reliability Analysis and Validity Test

Reliability analysis is measured by Cronbach's Alpha. Table 2 shows that the value of Cronbach's Alpha for all variables ranges from 0.965 and 0.970 which is significantly higher than 0.70. In fact, each variable is considered acceptable due to each value which is greater than 0.70 will be defined as reliable (Taber, 2017).

Table 2 Reliability analysis of each variable

Variable	Number of Items	Cronbach's Alpha
Perceive ease of use	6	0.965
Perceive of usefulness	5	0.960
Customer Satisfaction	6	0.970

RESULT

In general, the data presented in table 3 indicates noteworthy and favourable correlations between Intention to use and various factors: efficiency ($r = 0.535$, $p < 0.001$), perceive ease of use ($r = 0.637$, $p < 0.001$.), perceive of usefulness ($r = 0.762$, $p < 0.001$.), and service trust ($r = 0.799$, $p < 0.001$).

Table 3 Pearson correlation for variable of study.

	PEU	PE	CS
Perceive ease of use	1	0.975**	0.980**
Perceive of usefulness	0.975**	1	0.982**
Customer Satisfaction	0.980**	0.982**	1

**. Correlation is significant at the 0.01 level (2-tailed).

PEU= Perceive ease of use, PU = Perceive of usefulness, CS= Customer Satisfaction of using the Smart Home Appliance

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
Perceive ease of use	0.102	0.196		0.522	0.602
Perceive of usefulness	0.448	0.036	0.47	12.503	<0.001
Customer Satisfaction	0.657	0.043	0.57	15.309	<0.001

DISCUSSION

Discussion of Research Objectives

Objective 1: Factors Influencing Smart Home Appliance Adoption

Research indicates that housewives prioritize ease of use, energy efficiency, and advanced features like remote controls and automatic home appliances when selecting smart home appliances (Smith et al., 2023). These attributes enhance household task management by saving time and reducing energy consumption, making them highly valued (Wang & Zhang, 2020). To meet consumer expectations, manufacturers should focus on integrating these key features into smart home appliances, ensuring they align with user needs and preferences.

.**Objective 2: Consumer Behavior and Customer Satisfaction in Smart Home Technology**

The study found a strong link between consumer behavior factors—perceived usefulness and ease of use—and customer satisfaction in smart home appliances (Davis, 1989). Users reported higher satisfaction when smart home appliances were easy to operate and delivered their promised benefits. Statistical analysis confirmed that improved usability and functionality significantly enhance user experience and satisfaction (Lee & Park, 2021), emphasizing the need for manufacturers to prioritize these aspects in smart home technology design.

Objective 3: Recommendations for Enhancing Customer Satisfaction in Smart Home Technology

To improve customer satisfaction in the smart home appliances market, manufacturers should focus on clearer instructions and intuitive interface designs for easier operation (Smith et al., 2023). Simplifying advanced features and making them accessible to users with different levels of technological knowledge is crucial (Park & Kim, 2024). Additionally, marketing strategies should emphasize practical benefits such as energy efficiency and time savings to enhance user perception. By addressing these aspects, smart home technology can better meet consumer needs and expectations.

CONCLUSIONS

The study highlights key implications for manufacturers, marketers, and customer service providers in the smart home technology industry. Manufacturers should prioritize user-friendly designs, intuitive controls, and essential features like automatic detergent dispensers and remote-control options to enhance convenience and efficiency (Smith et al., 2023).

For marketers, targeted advertising should focus on practical benefits such as ease of use and energy efficiency, as these factors significantly influence customer satisfaction (Wang & Zhang, 2020). Digital platforms, including social media, should be leveraged to engage younger consumers, given that most respondents were aged 21 to 30 (Lee & Park, 2021).

Customer service providers play a crucial role in long-term satisfaction by offering effective after-sales support, including tutorials and troubleshooting services. Clear instructions and prompt responses to customer concerns can strengthen trust and loyalty (Park & Kim, 2024).

Collaboration among manufacturers, marketers, and service providers is essential to aligning product development, marketing strategies, and support services with consumer needs, ultimately enhancing satisfaction and competitiveness in the smart home technology market.

To enrich the current findings and provide a more holistic understanding of consumer behavior, future studies are encouraged to adopt a mixed-methods approach, integrating qualitative techniques such as semi-structured interviews or focus groups. These methods could yield deeper insights into user experiences, barriers, and contextual challenges not easily captured through surveys alone.

Moreover, expanding the demographic scope to include diverse user groups—such as working professionals, the elderly, or rural consumers—would enhance the generalizability of the results and offer a more inclusive perspective on smart home technology adoption. Further exploration into post-purchase behaviors, including long-term usage patterns, maintenance practices, and evolving satisfaction levels, would be valuable in understanding sustained engagement and technology lifecycle challenges.

By addressing these areas, future research could strengthen the theoretical and practical contributions of studies on smart home technologies and better inform stakeholders in technology design, marketing, and policymaking.

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