RESEARCH IN MANAGEMENT OF TECHNOLOGY AND BUSINESS
e-ISSN: 2773-5044

RMTB

Vol. 6 No. 2 (2025) 359-373
https://publisher.uthm.edu.my/periodicals/index.php/rmtb

The Influence of Self-Service Kiosks on Customers' Revisit Intention in Fast-Food Restaurants

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DOI: https://doi.org/10.30880/rmtb.2025.06.02.028

Article Info

Received: 30 September 2025
Accepted: 01 November 2025
Available online: 01 December 2025

Keywords

Self-service kiosks, customer revisit intention, fast-food industry

Abstract

Self-service kiosks (SSKs) have revolutionised customer revisit intention, experience and service delivery in the fast-food company. In the context of Malaysian fast-food restaurants, this study investigates the influences of self-service kiosks on customer revisit intention in fast-food restaurants. Through the integration of previous literature, this study highlights the essential elements such as functionality, security, assurance, enjoyment, design, convenience, and customisation that impact revisit intention. Adopting SSK not only increases operational effectiveness but also satisfies changing customer demands for individualised and convenient experiences. The objective of conducting this study is to identify the level of customer in using self-service kiosks, and to identify the level of customer intention to revisit the fast-food restaurant. This study also aims to identify the relationship between the usage of self-service kiosks and customer intention to revisit the fast-food restaurant. The researcher has decided to conduct the survey in Malacca, Malaysia. The target population of respondents for this study is residents of Malacca. A quantitative research design was employed, and a questionnaire was established and distributed to targeted respondents. The collected data will be analysed by Statistical Package for Social Sciences (SPSS). The results may serve as a reference to enhance the level of customer in using self-service kiosks and customer intention to revisit the fast-food restaurant.

1. Introduction

Self-service kiosks represent a significant technological advancement in the fast-food industry, providing customers with efficient and user-friendly interfaces to order and pay for their meals. In Malaysia, major fast-food chains such as McDonald's, KFC, and Burger King have adopted SSKs to meet increasing consumer demand for speed, convenience, and personalisation. Self-service kiosks in restaurants enhance ordering efficiency and meet consumers' demand for self-service options (Lee *et al*., 2023). These kiosks, equipped with touchscreen ordering units and point-of-sale payment systems, allow users to complete transactions with minimal staff intervention, enhancing convenience and efficiency (Shahril *et al*., 2021). Additional features such as ticket outlets, display screens, support frames, and loudspeakers contribute to a user-friendly design that streamlines the purchasing process (Kim & Qu, 2014). By automating the ordering experience, self-service kiosks boost productivity and effectiveness, while appealing to technology-savvy customers.

A Grand View Research analysis (2023) predicts a 13.8% growth in the global self-service technology market from 2023 to 2030. In Malaysia, technological advancements in the food and beverage industry have led

to the widespread adoption of self-ordering kiosks by major fast-food chains like McDonald's and KFC. McDonald's introduced kiosks in 2017, now present in most of its outlets (Ying, 2018; Sharil *et al*., 2021). These kiosks offer numerous benefits, including increased customer satisfaction, enhanced efficiency, reduced queuing times, and empowerment through greater control (Lee *et al*., 2023). They also provide detailed menu information, protect customer privacy, and address language or personal concerns (Yang *et al*., 2019; Yaacob *et al*., 2021). Gamification of self-service technology enhances customer engagement, encouraging impulsive menu selections and rewarding users with monetary prizes or loyalty points (Lee & Lu, 2023). Customers often prefer kiosks over cashiers, especially during crowded times, for a better overall experience (Leung *et al*., 2021). Additionally, self-service technology enables businesses to reduce labor costs by delivering services with fewer employees (Lin *et al*., 2011; Law *et al*., 2020). A self-service kiosk in a restaurant may increase efficiency, sales, productivity and revisit intention, but it was necessary to figure out whether customers were likely to use a self-ordering kiosk to buy their meals. Therefore, this study focused on the relationship between the usage of self-service kiosks and customer intention to revisit the fast-food restaurant.

The restaurant industry faced significant challenges in maintaining operational efficiency and ensuring customer satisfaction, both of which were critical factors influencing customers' intention to revisit. Many restaurants struggled with worker shortages, inefficient service delivery, and escalating operational costs, which adversely impacted service quality and customer experiences. In order to overcome these problems, restaurants have begun to use electronic technologies. Self-service kiosks have grown in popularity in the restaurant business due to the benefits of fewer physical touch, cheaper worker costs, convenience of ordering, and higher customer satisfaction and loyalty (Smith *et al*., 2021). Furthermore, self-service kiosks are becoming increasingly popular in the restaurant business due to the importance of wait times on customer satisfaction and the benefits of self-service technology in shortening wait times. Waiting in line is connected with worse service ratings (Taylor, 1994), perceived service quality (Dube-Rioux *et al*., 1989), and overall satisfaction (Katz and al., 1991). Furthermore, during peak hours, restaurant staff's workload might rise dramatically, resulting in lengthier wait times and a higher likelihood of order fulfilment issues or problems. Without self-service kiosks, restaurants may struggle to efficiently manage their workload, lowering service quality and customer satisfaction. Inadequate restaurant self-service kiosks can also lead to resource waste, since additional personnel may be required to do manual tasks that might be automated. Such inefficiencies have the potential to increase operational expenses and reduce profitability. As a result, self-service technology, particularly self-service kiosks, may assist restaurants in adapting to changing customer preferences while remaining competitive.

However, in an effort to expedite the purchasing process and improve the front-end experience, many businesses are turning to self-ordering kiosks as a game-changer. Self-ordering kiosks have grown in popularity in recent years, transforming how customers place and pay for purchases. Self-ordering kiosks are quickly becoming a fast-food industry mainstay due to their capacity to enhance operational efficiency and generate revenue (Ez Chow, 2024). Therefore, restaurants deploy self-service kiosks to boost customer loyalty and happiness, encouraging customers to revisit. Hence, the researcher wants to examine the influences of self-service kiosks on customer revisit intention in fast-food restaurants in this study.

Therefore, to achieve the research objectives, the level of customer use of self-service kiosks is determined. Apart from that, the level of customer intention to revisit the fast-food restaurant is also determined. On the other hand, the relationship between the usage of self-service kiosks and customer intention to revisit the fast-food restaurant is identified.

2. Literature Review

2.1 Fast-Food Restaurant in Malaysia

Fast food restaurants in Malaysia have experienced significant growth, influenced by urbanisation, changing lifestyles, and the impact of Western culture. Dominated by both international and local brands such as McDonald's, KFC, and Marrybrown, the industry caters to the increasing demand for quick and convenient meal options (Euromonitor International, 2020). These restaurants appeal to a diverse demographic by offering menus that suit various age groups and cultural preferences. To enhance efficiency and customer experience, many fast-food businesses have adopted digital solutions such as self-service kiosks, online ordering systems, and contactless payments. These technologies aim to improve convenience and safety while maintaining customer loyalty through reduced wait times and personalised ordering experiences (Muda, Mohd, & Hassan, 2020).

The competitive nature of Malaysia's fast-food industry drives continuous innovation and differentiation. Self-service kiosks provide a seamless ordering process while delivering an engaging and interactive experience. By integrating technology into service delivery, restaurants can enhance customer satisfaction and foster loyalty (Wang, 2021). Additionally, the demand for convenience and speed, driven by dual-income households and a growing middle class, has further fuelled the adoption of self-service kiosks. These kiosks not only boost

operational efficiency but also empower customers with greater control over their orders, enabling fast-food businesses to remain competitive and resilient while meeting evolving consumer expectations (Taufik, 2019).

2.2 Self-Service Kiosks

Technological advancements have significantly influenced the adoption of self-service kiosks in the fast-food industry, offering numerous advantages to both customers and businesses (Garg & Singhal, 2023). First introduced in the early 2000s by brands like McDonald's, these kiosks are now a standard feature in many fast-food outlets globally, designed to improve customer service by streamlining ordering and reducing wait times (Zhu *et al*., 2023). By addressing the growing demand for speed and convenience, self-service kiosks enhance customer satisfaction and foster loyalty through a more efficient and enjoyable dining experience (Wang *et al*., 2022).

Moreover, self-service kiosks contribute to revenue growth by suggesting personalised add-ons or upgrades, increasing the average transaction value while enhancing the customer experience (Kim & Qu, 2022). Despite the upfront costs, these kiosks deliver long-term financial benefits by lowering operational costs and boosting customer satisfaction (Chen *et al*., 2021). As a result, self-service kiosks have become a critical asset for fast-food restaurants looking to stay competitive and meet evolving consumer expectations.

2.3 Importance of Self-Service Kiosks in Fast-Food Restaurants

Self-service kiosks have become indispensable in fast-food restaurants, offering benefits that enhance both operational efficiency and customer experience. By streamlining the ordering process, these kiosks reduce wait times and allow staff to focus on other critical tasks, especially during busy hours (Yaacob *et al*., 2021). They also enable customers to customise their orders and review them at their own pace, reducing errors and improving satisfaction, which fosters greater loyalty (Yang *et al*., 2019).

Additionally, kiosks drive sales growth through upselling and cross-selling features, encouraging customers to explore additional menu items and increasing average transaction values (Lin *et al*., 2011). Their integration reflects the industry's response to evolving consumer preferences for convenience and digital interactions, with major chains like McDonald's and KFC adopting advanced kiosk features to cater to diverse needs (Smith *et al*., 2021). As consumer behaviour shifts toward technology-driven solutions, the 30% rise in kiosk usage in urban fast-food outlets over five years highlights their role in maintaining competitiveness and meeting modern customer expectations (Kim & Qu, 2020).

2.4 Attributes of Self-Service Kiosks Technology

The Technology Acceptance Model (TAM) has been the primary tool utilised in previous research to describe how customers accept technology. The model considers two key elements that are crucial to the adoption of technology, such as utility and simplicity of use. Some researchers believe the model was very basic and had attempted to include other variables, even though it clarified how and why consumers embrace new technology. A more thorough approach is offered by the Unified Theory of Technology Acceptance and Use (UTAUT), one of the theories that has been created in this endeavour.

Four factors were taken into consideration by the theory, which incorporates other theories, including TAM, such as effort expectations, performance expectations, facilitation, and social effects. Performance expectations measure how much the customer thinks using technology will help them perform better at work. This was comparable to the TAM idea of utility. Adoption of the technology was more probable if it was thought to be beneficial and useful for work performance. In a variety of contexts, research has shown that performance expectations have the most influence on intentions to utilise technology. For example, the study by Tarhini, Hone, and Liu demonstrated that the desire to embrace new technology was significantly influenced by functionality. Customers' estimations of how simple or complex a technology was to use were known as effort expectations.

In TAM, this idea was comparable to ease of use. Technology was more likely to be accepted when people believed it was simple to use. The customer's belief that people who hold significance for them believe that he or she should utilise the technology was known as social influence. Facilitation circumstances pertain to how the client views the technological infrastructure and organisational assistance. As was previously established, performance expectations were the component that affects adoption the most. As an illustration, Jeon, Sung, and Kim's UTAUT-based study demonstrated that the two factors that had the most effect on behavioural intentions to use were performance expectations (usefulness) and effort expectations (ease of use).

The results of this study indicate that characteristics connected to technology continue to be more significant than social influence or institutional support. Based on prior studies, this research will concentrate on technological attributes associated with kiosks, including functionality, security, assurance, enjoyment, design, convenience, and customisation. In a thorough examination of the literature on self-service technologies, Vakulenko, Hellstrom, and Oghazi found factors connected to technology that have been demonstrated to affect the experience of customers to revisit.

2.5 Customer Revisit Intention

Customer revisit intention is the likelihood of customers returning to an establishment based on prior experiences, significantly impacting loyalty and profitability (Dube-Rioux *et al*., 1989). Positive experiences, perceived value, and satisfaction are key predictors of revisit intentions. For example, McDonald's implementation of intuitive self-service kiosks improved revisit rates by 25% over two years (Smith *et al*., 2021), while KFC's user-friendly ordering process increased customer loyalty by 30% (Lee & Kim, 2022). Customers who perceive high value in personalised and efficient service are 40% more likely to return, highlighting the importance of these factors (Rahim *et al*., 2020).

Revisit intention in the fast-food industry is also influenced by food quality, service efficiency, and a pleasant dining environment, with convenience playing a critical role, especially in urban settings (Taylor, 1994; Katz *et al*., 1991). Furthermore, satisfied customers often contribute to positive word-of-mouth, attracting new patrons and bolstering the restaurant's reputation (Rajput & Gahfoor, 2020). Understanding and enhancing revisit intentions are therefore crucial for sustaining competitiveness in the fast-food sector.

2.6 Importance of Customer Revisit Intention

Understanding customer revisit intention is crucial for ensuring revenue stability and fostering cost-effective customer retention. Repeat customers provide a steady income stream, are less price-sensitive, and reduce the need for extensive marketing efforts (Taylor, 1994; Katz *et al*., 1991). Retaining loyal customers requires fewer resources than acquiring new ones, while also encouraging them to explore additional offerings, boosting overall revenue. Additionally, revisit intention drives brand advocacy, as satisfied customers share positive experiences, creating organic promotion and expanding the customer base (Rajput & Gahfoor, 2020). It also serves as a measure of service quality, with high revisit rates indicating success and low rates highlighting improvement areas (Pine & Gilmore, 1999). By addressing factors influencing loyalty, businesses can enhance customer satisfaction, improve service quality, and maintain a competitive edge (Yang *et al*., 2019).

2.7 Conceptual Framework

Fig. 1 showed that the purpose of the conceptual framework was to show whether there was a significant relationship between the usage of self-service kiosks and customer intention to revisit the fast-food restaurant.

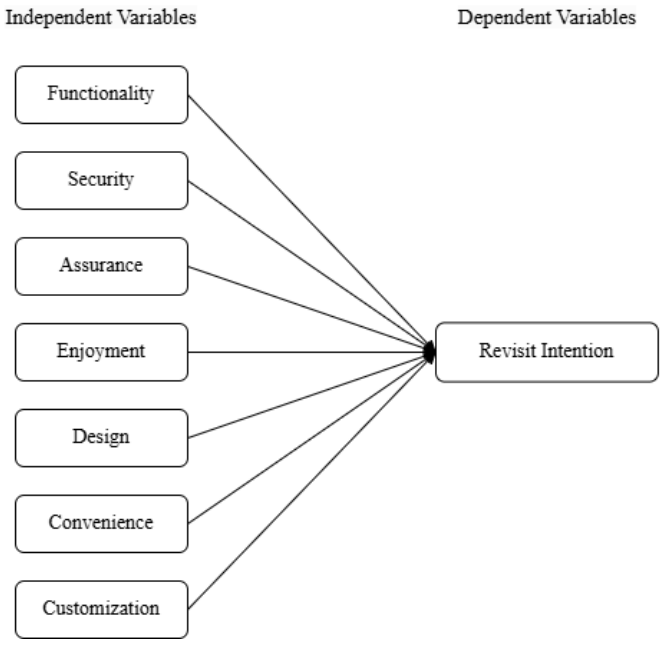

Fig. 1 *Conceptual framework*

2.8 Hypothesis Formulation

Based on previous research and literature review, this study examines seven attributes associated with self-service kiosk technology and customer revisit intention in fast-food restaurants. This section explores the

influences of self-service kiosks on customer revisit intention in fast-food restaurants, and the following hypotheses were formulated for empirical investigation:

H1: Functionality has a positive relationship with customer revisit intention.
H2: Security has a positive relationship with customer revisit intention.
H3: Assurance has a positive relationship with customer revisit intention.
H4: Enjoyment has a positive relationship with customer revisit intention.
H5: Design has a positive relationship with customer revisit intention.
H6: Convenience has a positive relationship with customer revisit intention.

3. Research Methodology

3.1 Research Design

The research design provides a structured framework linking all aspects of the study, guiding data collection and analysis to achieve the research objectives efficiently and coherently (Akhtar, 2016; Hakim, 1987). This study uses a mixed-methods approach, combining quantitative and qualitative research methodologies. The quantitative method, such as survey research, helps identify trends and averages, while qualitative research involves reviewing previous studies to gather relevant data (Bhandari, 2020; Gunnel, 2021). The survey, conducted via Google Forms with a 1-5 scale, aimed to assess customer revisit intentions in fast-food restaurants. The study also analysed the correlation between dependent and independent variables to address the research questions. (Neuman, 2014; Check & Schutt, 2012).

This research is conducted to understand the influences of self-service kiosks on customer revisit intention in fast-food restaurants. The researcher has decided to conduct the survey in Malacca, Malaysia, because one of the research projects, "Insights into the Behavioural Intentions of Customers' Use of Self-Service Kiosks (SSKs) in Fast Food Restaurants in Melaka", was carried out by Susandra Ketimin, Nurulizwa Abdul Rashid, and Samer Shami. The purpose of the study was to determine the main determinants of consumers' desire to utilise self-service kiosks (SSKs) at fast food restaurants located in Melaka, Malaysia. The study focused on factors such as perceived utility, perceived ease of use, interaction needs, and risk using the Technology Acceptance Model (TAM) as a framework.

3.2 Research Population and Sample

According to Momoh (2024), the phrase "research population" generally refers to a large group of people or individuals who are the major focus of a scientific investigation. Population is defined as a distinct group of people, whether that group is a country or a group of individuals who share a similar characteristic. In statistics, a population is the entire group of persons from which a statistical sample is drawn for research purposes. The population for this study was the residents of Malacca, Malaysia, who had a population of 1,027,500 as of July 2023. The data were derived from the populations of Malaysia's states, federal territories, and districts, as determined by census results and official population estimates. The sample size was obtained using the table produced by Krejcie and Morgan (1970), which was 384 respondents out of a total population of 1 million or more.

3.3 Sampling Method

In market research, researchers employ a variety of sampling methodologies to collect useful insights without having to investigate the full population (Fleetwood, 2023). Sampling methods are classified into two types which are probability sampling and non-probability sampling. As a result, a non-probability sampling approach was used in this study. Non-probability sampling approaches are divided into five categories, which are purposive sampling, convenience sampling, snowball sampling, quota sampling, and self-selection sampling (Galloway, 2005). Hence, the sampling method used in this research was purposive sampling. The purposive sampling approach is utilised in the majority of research articles since it is found in any study paradigm and helps to guarantee that high-quality samples are selected without bias, boosting the reliability and credibility of the findings.

3.4 Data Collection

According to Kabir (2016), data collection is the act of measuring and acquiring information on variables of interest in a systematic manner that allows one to answer specific research questions, test hypotheses, and assess outcomes. When doing scientific research, data collection is used to determine the materials required for the investigation. Data sources are classified into two types, which are primary data and secondary data. Therefore, the researcher used both types of data sources in this study.

3.4.1 Primary Data

Primary data is information gathered from firsthand experience. Primary data has yet to be released but is more trustworthy, objective, and authentic. Primary data sources are limited, and it might be difficult to get data from them at times due to either population scarcity or a lack of collaboration. Primary data can be obtained by experiments, questionnaires, interviews, surveys, or observation. Thus, the researcher has been using the primary source of individuals, such as providing questionnaires to the respondents in Malacca, Malaysia, to get more information and to achieve the objective of this research.

3.5 Pilot Study

According to Ismail, Kinchin and Edwards (2018), a pilot study is a small-scale research initiative that precedes the larger study. The pilot study assisted the researcher in determining whether the respondent was having difficulty completing the questionnaire or whether any questions were misinterpreted by respondents. The researcher conducts pilot testing to confirm the questionnaire's quality, validity, and reliability. This might prevent issues in the final data gathering. Thus, a pilot test was conducted on 30 randomly chosen respondents who participated in the actual data collection process. Apart from that, a total of 384 questionnaires were collected as part of the pilot test to obtain replies and feedback on the questionnaire.

3.6 Research Instrument

In this study, questionnaires were used since they are both convenient and effective for data collection. Questionnaires are used to help gather information on people's views, levels of knowledge, attitudes, and actions regarding a certain component (Boynton & Greenhalgh, 2004). The data collected from the questionnaire were used to examine the influences of self-service kiosks on customer revisit intention in fast-food restaurants.

The questionnaire is divided into three sections, which are Part A, Part B, and Part C. Part A focuses on the demographic information of respondents. It covers information about respondents' backgrounds such as gender, age, race, educational level, and employment. Besides that, Part B consists of items related to the level of customer in using self-service kiosks, while Part C consist of items related to the level of customer intention to revisit the fast-food restaurant. The questionnaire uses a five-point Likert scale.

3.7 Data Analysis

Data analysis is the process of examining and processing data and information in order to reach findings and solve problems in a study. The questionnaire is examined at the conclusion of the study to confirm that the questions are appropriate for the study's objectives. After the respondents have completed the questionnaire survey, the researcher uses the Statistical Package for the Social Sciences (SPSS) to examine the data acquired. The SPSS tables are intended to help researchers better comprehend the data received from target respondents for this research project, and their ability to perform statistical analyses and create visual representations.

3.7.1 Descriptive Statistical Analysis

Descriptive analysis is a type of data analysis that helps to explain, depict, or summarise data sets in a constructive manner so that patterns can emerge that me*et al*l of the data's requirements (Rawat, 2021). In this research study, the researcher conducted descriptive analysis on the demographic information of the respondents and investigated the level of customer satisfaction in using self-service kiosks and customer intention to revisit the fast-food restaurant. SPSS can assist in discovering missing values, and data can be turned into charts like histograms for visualisation and investigation. The final findings would be provided in summary form, including mean, valid percentage, frequency, and cumulative percentage.

3.7.2 Reliability Analysis

Reliability analysis is concerned with a scale's capacity to consistently represent the construct being assessed. Cronbach's alpha is an internal consistency metric that may also be used to evaluate scale dependability. Researchers have utilised Cronbach's Coefficient Alpha, which ranges between 0 and 1, to assess dependability. In this Cronbach's Coefficient Alpha technique, if the value in this study is 0.60 or above, it indicates reliability and internal consistency. If the value goes below 0.60, the consequence is the reverse.

3.7.3 Correlation Analysis

Correlation analysis measures the strength and direction of relationships between independent and dependent variables, using Pearson's or Spearman's rho correlation (Baskuran & Krishnamurthy, 2016). Pearson's

Correlation is used for normally distributed data, while Spearman's rho Correlation is for non-parametric data. Both are applied to data from research methods such as surveys and polls to identify significant relationships, patterns, or trends between variables. In this study, correlation analysis will be used to explore the relationship between the usage of self-service kiosks and customer intention to revisit the fast-food restaurant. Positive correlations indicate both variables increase together, while negative correlations show one increases while the other decreases. The correlation coefficient ranges from -1 to 1, indicating the strength of the association (Neuman, 2014; Hair *et al*., 2007).

4. Data Analysis and Findings

4.1 Respondent Rate

The respondent return rate is the percentage of respondents from the initial sample frame who were located, contacted, qualified, consented to participate, as well as completed the whole questionnaire. The target respondents for this study were focused on the respondents who live in Malacca, Malaysia. According to Krejcie and Morgan (1970), the target sample size for this research was 384 respondents. A total of 318 sets of questionnaires from the 384 issued have been collected with the assistance of the respondents. Therefore, the questionnaire survey return rate was 82.81% who were willing to participate in this research study.

4.2 Reliability Analysis

4.2.1 Reliability of Pilot Study

A pilot test involving 30 randomly selected respondents was conducted to assess the reliability of the study's variables. The test analysed 38 items, with Cronbach's Alpha values calculated for each variable. Thus, all values exceeded 0.60 and above, the researcher concluded that the questions were reliable and suitable for the actual data collection.

Table 1 *Reliability test for pilot study*

No	Variables	Number of Respondents	Number of items	Cronbach's Alpha (α)
1.	Functionality	30	5	0.895
2.	Security	30	8	0.902
3.	Assurance	30	3	0.824
4.	Enjoyment	30	4	0.845
5.	Design	30	5	0.882
6.	Convenience	30	5	0.893
7.	Customization	30	5	0.902
8.	Revisit Intention	30	3	0.806

4.2.2 Reliability of Actual Test

The reliability test for the actual study, involving 318 respondents, showed Cronbach's Alpha values for each independent variable: functionality (0.691), security (0.904), assurance (0.796), enjoyment (0.766), design (0.703), convenience (0.742), and customisation (0.789). The dependent variable, revisit intention, had a value of 0.723. Therefore, all the variable of this research study was proven to be accepted with the value of 0.6 and above, with security having the highest value (0.904) and functionality the lowest (0.691), but still acceptable. The study demonstrated good overall reliability across 38 items.

Table 2 *Reliability test for the actual study*

No	Variables	Number of Respondents	Number of items	Cronbach's Alpha (α)
1.	Functionality	318	5	0.691
2.	Security	318	8	0.904
3.	Assurance	318	3	0.796
4.	Enjoyment	318	4	0.766
5.	Design	318	5	0.703
6.	Convenience	318	5	0.742
7.	Customization	318	5	0.789

8.	Revisit Intention	318	3	0.723

4.3 Demographic Analysis for Demographic Profile

Based on Table 3, the results were analysed and illustrated the demographic profile of a total of 318 respondents. In this research, the demographic information included gender, age, race, educational level, and occupation. The analysed data helped to present a clear distribution and percentage of the respondents. Hence, the full examination of each item will be presented in the next section.

Table 3 *Summary of demographic analysis*

Demographic	Category	Frequency (N)	Percentage (%)
Gender	Male	152	47.8
	Female	166	52.2
Age	Less than 20 years old	41	12.9
	20 – 29 years old	109	34.3
	30 – 39 years old	67	21.1
	40 – 49 years old	71	22.3
	Above than 49 years old	30	9.4
Race	Malay	56	17.6
	Chinese	139	43.7
	Indian	88	27.7
	Others	35	11.0
Educational Level	Below High School	35	11.0
	Pre-University/Diploma	70	22.0
	Degree	110	34.6
	Master	68	21.4
	Doctorate Degree (PHD)	35	11.0
Occupation	Student	78	24.5
	Employee	105	33.0
	Self-Employed	82	25.8
	Unemployed	53	16.7

4.4 Descriptive Analysis for Independent and Dependent Variables

Based on Table 4, the results presented the average, mean and standard deviation of each attribute for the questionnaire. The results showed that the functionality received the highest mean score of 3.9874 with a standard deviation of 0.61267. In contrast, design received the lowest mean score of 3.4113 with a standard deviation of 0.73904. The second-highest mean score was assurance, with a mean of 3.9665 and a standard deviation of 0.97870. The security received the third-highest mean score of 3.9249 with a standard deviation of 0.72576. This was followed by the enjoyment, convenience, and customisation, which recorded mean scores of 3.8105, 3.7252 and 3.7208 with standard deviation of 0.81178, 0.73904 and 0.82623, respectively. Meanwhile, revisit intention had a mean score of 3.5115 with a standard deviation of 0.80376.

Table 4 *Summary analysis of average mean and std. deviation*

Item	N	Mean	Standard Deviation
Functionality	318	3.9874	0.61267
Security	318	3.9249	0.72576
Assurance	318	3.9665	0.97870
Enjoyment	318	3.8105	0.81178
Design	318	3.4113	0.79390
Convenience	318	3.7252	0.73904
Customization	318	3.7208	0.82623
Revisit Intention	318	3.5115	0.80376

4.5 Normality Test

Table 5 shows the Kolmogorov-Smirnov and Shapiro-Wilk normality test results of the independent variables and revisit intention. Therefore, the data in the table indicated that all variables had a p-value lower than 0.05, confirming that the data did not conform to a normal distribution.

Table 5 *Normality test*

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Functionality	.246	318	.000	.861	318	.000
Security	.245	318	.000	.838	318	.000
Assurance	.191	318	.000	.885	318	.000
Enjoyment	.233	318	.000	.886	318	.000
Design	.095	318	.000	.983	318	.001
Convenience	.108	318	.000	.942	318	.000
Customization	.155	318	.000	.940	318	.000
Revisit Intention	.187	318	.000	.947	318	.000

a. Lilliefors Significance Correction

4.6 Correlation Analysis

The Spearman's Correlation Coefficient data are shown in Table 6. In this study, design demonstrated the strongest relationship with revisit intention with a correlation coefficient of 0.672 and a p-value of 0.000, which falls within the range of a moderate relationship (r = 0.672, p = <0.01). Additionally, convenience and customization showed weaker positive relationship with correlation coefficients of 0.262 and 0.289 respectively, and p-values of 0.000 for both, indicating very weak relationship (r = 0.262, p = <0.01), and (r = 0.289, p = <0.01). Besides that, functionality (r = 0.135) and assurance (r = 0.143) also demonstrated very weak but statistically significant relationships with p-values of 0.016 (r = 0.135, p = <0.05) and 0.011 (r = 0.143, p = <0.05) respectively. On the other hand, enjoyment showed a weak relationship with a coefficient of 0.216 and a p-value of 0.000 (r = 0.216, p = <0.01), while security had a very weak negative relationship (-0.066) with a p-value of 0.238 (r = -0.066, p = >0.05), which was not statistically significant.

Table 6 *Result of Spearmen's rho correlation analysis*

Correlations

			AVE_FUNC	AVE_SEC	AVE_ASS	AVE_ENJ	AVE_DES	AVE_CON	AVE_CUS	AVE_REV
Spearman's rho	AVE_FUNC	Correlation Coefficient	1.000	.621**	.259**	.342**	.152**	.572**	.584**	.135*
		Sig. (2-tailed)	.	.000	.000	.000	.007	.000	.000	.016
		N	318	318	318	318	318	318	318	318
	AVE_SEC	Correlation Coefficient	.621**	1.000	.645**	.654**	.019	.114*	.201**	-.066
		Sig. (2-tailed)	.000	.	.000	.000	.731	.042	.000	.238
		N	318	318	318	318	318	318	318	318
	AVE_ASS	Correlation Coefficient	.259**	.645**	1.000	.745**	.247**	-.219**	-.086	.143*
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.126	.011
		N	318	318	318	318	318	318	318	318
	AVE_ENJ	Correlation Coefficient	.342**	.654**	.745**	1.000	.321**	-.031	.057	.216**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.578	.308	.000
		N	318	318	318	318	318	318	318	318
	AVE_DES	Correlation Coefficient	.152**	.019	.247**	.321**	1.000	.242**	.282**	.672**
		Sig. (2-tailed)	.007	.731	.000	.000	.	.000	.000	.000
		N	318	318	318	318	318	318	318	318
	AVE_CON	Correlation Coefficient	.572**	.114*	-.219**	-.031	.242**	1.000	.685**	.262**
		Sig. (2-tailed)	.000	.042	.000	.578	.000	.	.000	.000
		N	318	318	318	318	318	318	318	318
	AVE_CUS	Correlation Coefficient	.584**	.201**	-.086	.057	.282**	.685**	1.000	.289**
		Sig. (2-tailed)	.000	.000	.126	.308	.000	.000	.	.000
		N	318	318	318	318	318	318	318	318
	AVE_REV	Correlation Coefficient	.135*	-.066	.143*	.216**	.672**	.262**	.289**	1.000
		Sig. (2-tailed)	.016	.238	.011	.000	.000	.000	.000	.
		N	318	318	318	318	318	318	318	318

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

*. Correlation is significant at the 0.05 level (2-tailed).

4.7 The Relationship Between the Usage of Self-Service Kiosks and Customer Intention to Revisit the Fast-Food Restaurant (In Graphical Method)

4.7.1 Functionality

The link between functionality and revisit intention was seen in Fig. 2. The resulting linear equation for this connection is y = 2.74 + 0.19(x), and the r value is 0.022. The line indicated a positive trend, suggesting that as functionality increased, revisit intention tended to increase.

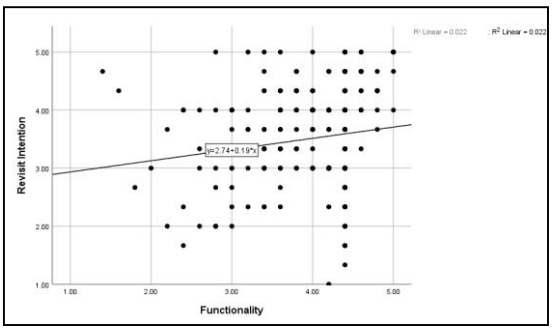

Fig. 2 *The relationship between functionality and revisit intention*

4.7.2 Security

The link between security and revisit intention was seen in Fig. 3. The resulting linear equation for this connection is y = 3.42 + 0.02(x), and the r value is 4.214E-4 (0.0004214). This refers to a very small linear correlation coefficient in the context of statistical analysis. But the line indicated a positive trend, suggesting that as security increased, revisit intention tended to increase a bit.

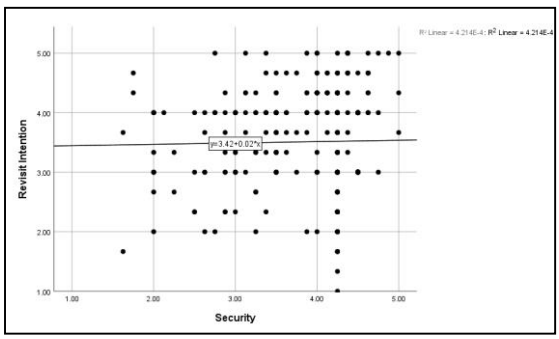

Fig. 3 *The relationship between security and revisit intention*

4.7.3 Assurance

The link between assurance and revisit intention was seen in Fig. 4. The resulting linear equation for this connection is y = 2.7 + 0.2(x), and the r value is 0.062. The line indicated a positive trend, suggesting that as assurance increased, revisit intention tended to increase.

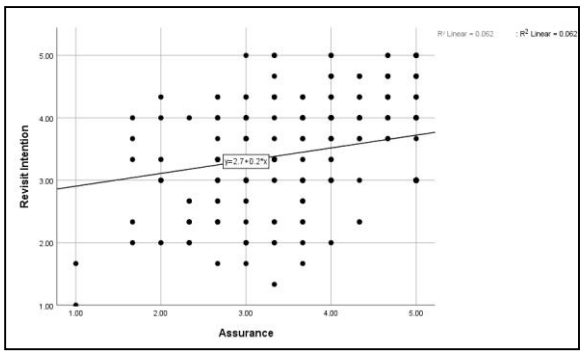

Fig. 4 *The relationship between assurance and revisit intention*

4.7.4 Enjoyment

The link between enjoyment and revisit intention was seen in Fig. 5. The resulting linear equation for this connection is y = 2.51 + 0.26(x), and the r value is 0.071. The line indicated a visible upward trend in revisit intention as enjoyment increased.

Research in Management of Technology and Business Vol. 6 No. 2 (2025) p. 359-373

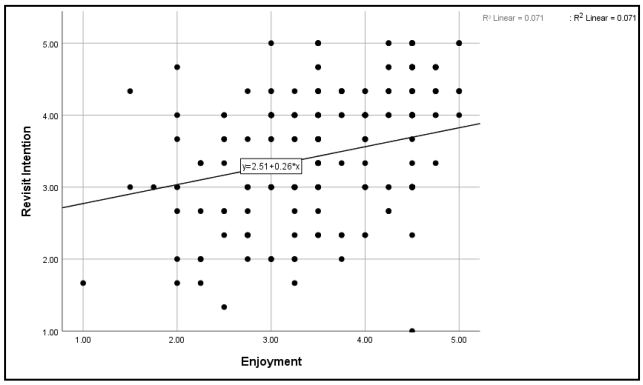

Fig. 5 *The relationship between enjoyment and revisit intention*

4.7.5 Design

The link between design and revisit intention was seen in Fig. 6. The resulting linear equation for this connection is y = 1.26 + 0.66(x), and the r value is 0.423. The line indicated a clear upward trend was visible, suggesting that higher ratings of design were associated with higher levels of revisit intention.

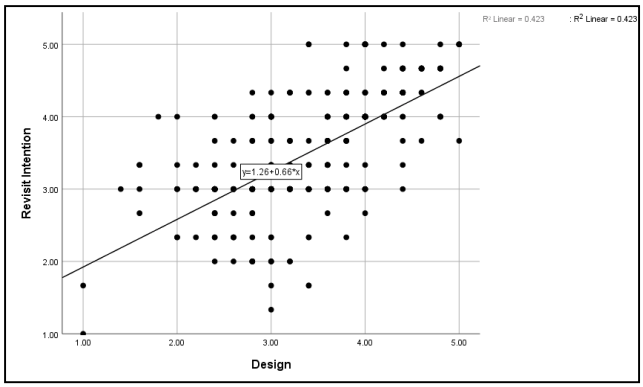

Fig. 6 *The relationship between design and revisit intention*

4.7.6 Convenience

The link between convenience and revisit intention was seen in Fig. 7. The resulting linear equation for this connection is y = 2.55 + 0.26(x), and the r value is 0.057. The line indicated a positive trend, suggesting that as assurance increased, revisit intention tended to increase.

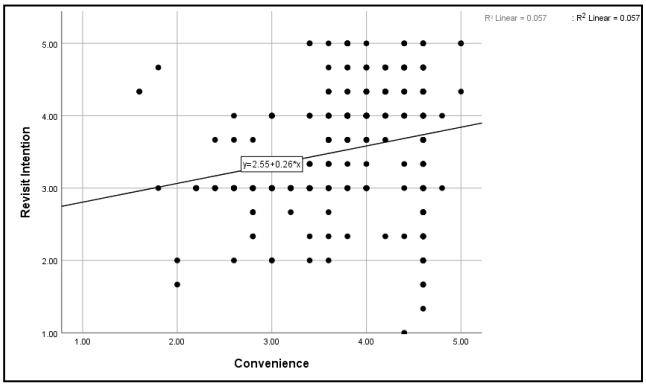

Fig. 7 *The relationship between convenience and revisit intention*

4.7.7 Customization

The link between customization and revisit intention was seen in Fig. 8. The resulting linear equation for this connection is y = 2.61 + 0.24(x), and the r value is 0.062. The line indicated a positive trend, suggesting that as assurance increased, revisit intention tended to increase.

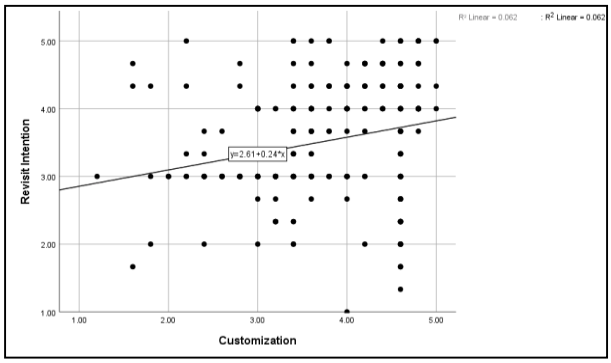

Fig. 8 *The relationship between customization and revisit intention*

5. Conclusion

This research utilised questionnaires to examine the level of customer usage of self-service kiosks, focusing on seven attributes: functionality, security, assurance, enjoyment, design, convenience, and customisation. Using a Likert Scale, respondents rated their perceptions on these attributes. The findings revealed that functionality received the highest mean score of 3.9874, followed by assurance (3.9665) and security (3.9249), indicating their significant influence on customer usage. Enjoyment, convenience, and customisation had moderate mean scores of 3.8105, 3.7252, and 3.7208, respectively, while design scored the lowest mean of 3.4113, suggesting it is a less prioritised aspect for users. The Cronbach's Alpha values for all attributes ranged between 0.691 and 0.904, confirming the reliability of the variables in the study. The findings align with previous studies, such as Lee *et al*. (2019), who emphasized functionality as a key driver of customer satisfaction and revisit intentions due to its role in reducing wait times and improving order accuracy. While design had the lowest mean score in this study, Hwang *et al*. (2021) stressed its importance in creating an aesthetically pleasing interface to enhance customer emotions and revisit intentions. High scores for assurance and security indicate customer confidence in reliable and secure transactions, as supported by Kim and Qu (2020). Meanwhile, the moderate scores for enjoyment, convenience, and customization reflect their secondary influence, consistent with Kumar's (2021) assertion that while convenience attracts users, customization enhances satisfaction by catering to individual preferences.

The study revealed that the revisit intention had a mean score of 3.5115 with a standard deviation of 0.80376, based on three items analyzed. The highest mean score (3.55) was for the statement, "I definitely want to visit this store again," followed by "I will try to revisit this store" (3.52) and "In the future, I plan to visit this store" (3.46). These results suggest a slight inclination toward repeat visits, indicating general customer satisfaction but room for improvement in the dining experience to enhance customer loyalty. The Cronbach's Alpha for the dependent variable, revisit intention, was 0.723, confirming its reliability as a measure. These findings align with prior research by Ha and Jang (2010), who linked customer satisfaction with functional and enjoyable self-service experiences to revisit intentions. Similarly, Selnes (1993) highlighted that customer loyalty often involves the intention to repurchase or continue with the same service provider, making revisit intentions a key satisfaction indicator. Thus, fostering customer satisfaction and loyalty remains a critical objective for restaurants and businesses aiming for sustained success.

According to Spearman's rho Correlation analysis, that had showed the design demonstrated the strongest relationship with revisit intention and underline the significant of design as a critical attribute influencing revisit intention, while other variables had limited or minimal impact. According to the analysis, the independent variable design demonstrated a strong positive relationship with revisit intention, with a regression equation of $y = 1.26 + 0.66(x)$. This value falls above 0.70, indicating a significant influence of design on customer revisit intention. The independent variable enjoyment exhibited a moderate positive relationship with revisit intention, with the regression equation $y = 2.51 + 0.26(x)$. Similarly, customization ($y = 2.61 + 0.24(x)$) and convenience ($y = 2.55 + 0.26(x)$) showed weak positive relationships with revisit intention, with values in the range of 0.21 to 0.40, suggesting their limited but noticeable impact on encouraging customer loyalty. In contrast, functionality ($y = 2.74 + 0.19(x)$) showed a very weak positive relationship with revisit intention, with values falling between 0.00 to 0.20, indicating minimal influence. Security ($y = 3.42 + 0.02(x)$) exhibited almost no relationship with revisit intention, emphasizing that it is perceived as a baseline expectation rather than a driver of loyalty. Assurance ($y = 2.7 + 0.2(x)$) showed a weak positive relationship, suggesting a supportive but non-critical role in influencing revisit intention. Therefore, the linear regression line for seven attributes had a positive relationship with revisit intention.

This study examined the influence of self-service kiosks on customer revisit intentions in fast-food restaurants, emphasizing the importance of understanding customer needs and market trends to maintain relevance. Using a quantitative approach, the research targeted 384 respondents from Malacca, Malaysia, and collected 318 completed questionnaires for analysis. The study successfully achieved its objectives by identifying

the level of customer usage of self-service kiosks, their intention to revisit fast-food restaurants, and the relationship between kiosk usage and revisit intentions. The findings revealed that the variables significantly influenced customer revisit intentions, providing valuable insights for stakeholders in the food industry to enhance customer loyalty through kiosk technology.

Acknowledgement

The authors would like to thank the Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia for its support, and all the respondents involved in this research study.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: ***study conception and design:*** *How Xuan Yi, R. Chandrashekar;* ***data collection:*** *How Xuan Yi;* ***analysis and interpretation of results:*** *How Xuan Yi;* ***draft manuscript preparation:*** *How Xuan Yi, R. Chandrashekar. All authors reviewed the results and approved the final version of the manuscript.*

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