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The adoption of AI into online delivery services: A study based on the Sri Lankan supermarket industry

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Abstract

This research aims to examine the factors that impact Artificial Intelligence (AI) in online delivery services within the Sri Lankan supermarket industry. This study's findings are valuable for organisations aiming to gain a competitive advantage over rivals by leveraging AI-integrated tools to improve customer relationship management, a crucial aspect in customer satisfaction and retention. A quantitative method was adopted using a structured questionnaire to obtain the responses of 100 customers from Colombo using online supermarket delivery services. Primary data findings reveal that personalisation, speed, accuracy and human-like interaction have a strong positive correlation with the adoption of AI. Specifically, "human-like interaction" is recognised as the most significant factor that influences AI adoption, based on multiple linear regression analysis. Therefore, supermarkets need to be particularly mindful of these factors, especially "human-like interaction," when incorporating AI into their online delivery services to ensure successful adoption by customers. The finding reveal that the customers are willing to adopt AI. The customers agreed that integrating AI into online supermarket delivery services would enhance their overall shopping experience by improving personalisation, speed and accuracy.

Keywords: Artificial intelligence, Online delivery services, Supermarket industry

1. Introduction

1.1. Background of the Study

Digitalisation has become crucial in the modern era, significantly impacting how people live and businesses operate. It encompasses high-end tools like artificial intelligence, machine learning and other advanced technologies, which has aided to enhance business operations contributing to positive organisational changes (Bukhari, Daim, Alzahrani, Gillpatrick & Santiago, 2024). Digitalisation has evolved to where consumers form perceptions about a company based on their online presence. Thereby, the reliance on digital platforms has drastically increased, making online presence imperative for all businesses, specifically, the food retail industry, which is important to all (Bukhari et al., 2024).

Particularly, speed and selection are important customer requirements when shopping online. Therefore, retailers are constantly finding ways to engage customers through technology (Bukhari et al., 2024). Consequently, the integration of AI in online delivery services is ideal, since it has the potential to cater to different customers through quick and personalised services (Lee, 2020).

Several retail outlets have utilised AI in their online platforms (Ying 2022; Lu, Cai, & Gursoy, 2019). Sri Lankan supermarkets are yet to adopt AI into their online shopping services. Therefore, this research aims to study the adoption of AI in online delivery services in the Sri Lankan supermarket industry.

1.2 Overview of the industry

According to Nadarajah, Chanaka, and Achchuthan (2014), supermarkets are a large store that offers a wide variety of consumable and household items organised in different shelves. The retail sector has been a major contributor to the GDP, providing one third of national GDP, while providing 14% of employment in Sri Lanka (Habaragoda, 2021).

The most prominent Sri Lankan supermarkets are Cargills Food City, Arpico and Keells Super

(Nadarajah et al., 2014). There is a robust competition among the supermarkets (Karunaratna, 2021). Customers prioritise service quality, which is regarded as a critical factor to foster satisfaction and loyalty (Ahmad, Ihtiyar, and Omar, 2014). Hence, retailers are constantly finding ways to create a competitive edge over rivals (Ahmad et al., 2014).

1.3 Rationale

Supermarkets are becoming a prominent shopping destination and are constantly evolving as an attempt to keep up with changing trends (Vithanage, Wattage, Kariyawasam, Wilson, & Khanal, 2023; Rishi & Singh, 2012). This has led to high competition, motivating supermarkets to explore various techniques to form a competitive edge over its rivals (Karunaratna, 2021). The benefit of technology enables personalised services fostering customer satisfaction (Grewal, Roggeveen, & Nordfält, 2017). Many studies prove positive impacts concerning the integration of technology on the overall performance in retail (Bukhari et al., 2024). This is due to AI-based solutions being developed in a manner to meet a variety of customer requirements (Grewal et al., 2017). Sri Lankan supermarkets, however, have not yet adopted AI into the online shopping services.

The insufficient use of technology presents a concerning challenge for traditional businesses in acquiring vital supply and demand data (Souiden, Ladhari & Chiadmi, 2019). This difficulty is compounded by the increasing preference of shoppers, who are inclined to virtual channels which often incorporate tools like chatbots (Souiden at al., 2019). Thus, numerous consumers highly prefer online shopping due to its convenience (Wang, Ji & Zhao, 2024; Njomane & Telukdarie, 2022). Some customers visit physical stores to see products, yet buy them online to acquire discounts (Wang, Ji, & Zhao, 2024). The retail industry is evolving from traditional to contemporary online retailing (Ailawadi & Farris, 2017; Grewal et al., 2017) by actively investigating and employing technology to improve customer experience (Bukhari et al., 2024).

It is noteworthy that using AI enables customers to buy the ideal product based on their tastes (Wang, Ji, and Zhao, 2024). For example, by learning about customer preferences, AI chatbots may interact with consumers and provide tailored services (Kalisetty, 2025; Cohen, 2018; Yang, Zhang, & Yan, 2022). This demonstrates that online retailing systems can be simplified and revolutionalise organisations to adapt to a digitalised era. Meanwhile, the COVID crisis has shown a change in consumer's purchasing habits with e-commerce becoming increasingly popular (Creazza et al., 2022). Thus, customers anticipate a prompt and easy method for shopping (Spencer, 2024). Hence, e-commerce is perceived to help retailers win within this digitalised context (Melacini, Perotti, Rasini, & Tappia, 2018). Therefore, it is important to study the adoption intentions of Sri Lankan customers towards AI integration into the online delivery services in the Sri Lankan supermarket industry.

1.4 Research Aim

This study aims to evaluate the adoption of AI in online delivery services in the Sri Lankan Supermarket industry.

1.5 Research Objectives

1. Identify the factors that lead to adoption of AI in online delivery services

2. Identify the significant factors that lead to adoption of AI in online delivery services within the Sri Lankan supermarket industry.

3. To make recommendations on the adoption of AI in online delivery services within the Sri Lankan supermarket industry.

1.6 Scope

This study will be based on a survey of one hundred customers of Sri Lankan supermarkets based in Colombo.

1.7 Significance

The supermarkets can benefit by understanding the adoption intentions of AI in online delivery services and the significant factors that drive AI adoption.

This study will add to the limited research concerning the adoption of AI in the Sri Lanka.

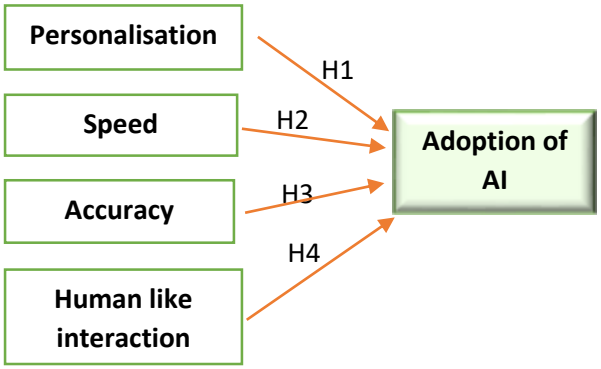
2. Methodology

2.1 Research Method

This study used the quantitative research method, since it is suitable to study the adoption intentions of a large population.

2.2 Conceptual Framework

The independent variables are personalisation, speed, accuracy and human like interaction as illustrated in Figure 1.



Independent variable Dependent variable

Figure 1. Conceptual Framework

2.3 Hypotheses

$H1_A$ - There is a relationship between personalisation and AI adoption in online delivery services.

$H1_0$ - There is no relationship between personalisation and AI adoption in online delivery services.

$H2_A$ - There is a relationship between speed and AI adoption in online delivery services.

$H2_0$ - There is no relationship between speed and AI on online delivery services.

$H3_A$ - There is a relationship between accuracy and AI adoption in online delivery services.

$H3_0$ - There is no relationship between accuracy and AI adoption in online delivery services.

$H4_A$ - There is a relationship between human like interaction and AI adoption in online delivery services.

$H4_0$ - There is no relationship between human like interaction and AI adoption in online delivery services.

2.4 Population and Sample

The population of the study are the customers who make purchases using online delivery services. A sample of 100 customers were selected based on the convenience sampling technique.

2.5 Data Collection

This research used Microsoft Forms, an online survey to collect the data. The survey used a 5-point Linkert Scale based questionnaire.

2.6 Data Analysis

Quantitative data gathered through the structured questionnaire was analysed using SPSS software. Correlation and multiple linear regression analysis were conducted.

3. Analysis and Findings

3.1 Demographic Data

Table 1. Demographic Data

	Description	Percentage (%)
Gender	Male	43.00%
	Female	46.00%
	Prefer not to say	11%
Age	20-29	62.89%
	30-39	17.53%
	40-49	19.59%
Highest Educational Qualification	High school diploma	15.31%
	College diploma	16.33%
	Degree	30.61%
	Masters	31.63%
	PhD	6.12%
Occupation	Student	14.29
	Self employed	20.41%
	Employed	58.16%
	Unemployed	6.12%
	Retired	1.02%

As show in Table 1, the majority of the respondents (63%) are young, in the age category of 20-29, with higher educational qualifications and are employed.

3.2 Data Validity and Reliability

The Cronbach Alpha test is suitable to assess the reliability of the scale when a questionnaire is created utilising many Likert scale statements (Taber, 2017; Chetty & Datt, 2015).

Cronbach's alpha score should be greater than 0.7 in order to be acceptable (Taber, 2017).

Table 2. Cronbach Alpha

Variables	Cronbach's Alpha
Personalisation	.757
Speed	.859
Accuracy	.892
Human like interaction	.849

Cronbach's Alpha values for every variable show high reliability, surpassing the 0.7 threshold. This verifies that the questionnaire items consistently measure their respective constructs, guaranteeing the data's validity for additional analysis.

3.3 Pearson Correlation

Table 3. Pearson Correlation

Independent variable	Pearson Correlation	Sig Value
Personalisation	.540	<.001
Speed	.655	<.001
Accuracy	.724	<.001
Human like interaction	.749	<.001

Correlation analysis is the process of examining the relationship between variables. Thereby, a positive correlation ranges from 0 to +1, whereas a negative correlation is below 0 (Gogtay & Thatte, 2017). In this instance, Table 3 illustrates that all the variables are above 0.5 which implies a strong correlation. This demonstrates that there's a strong positive correlation between the dependent and independent variables.

Moreover, an acceptable Sig. value less than 5% (0.05) indicates a statistically significant correlation between the independent variable and the dependent variable (Kwak, 2023). In this case, all the variables (as indicated on Table 3) are less than 0.01, which means there is a statistically significant correlation between all the aforementioned independent variables and the adoption of AI.

3.4 Hypotheses Validation

Based on the correlation analysis, all the hypotheses are accepted as shown in Table 4.

Table 4. Hypotheses

Hypotheses	Accepted/Rejected
$H1_A$ - There is a relationship between personalisation and AI in online delivery services.	Accepted
$H2_A$ - There is a relationship between speed and AI in online delivery services.	Accepted
$H3_A$ - There is a relationship between accuracy and AI in online delivery services.	Accepted
$H4_A$ - There is a relationship between human like interaction and AI in online delivery services.	Accepted

The correlation analysis reveals that personalisation, speed, accuracy and human like interaction are positively correlated to AI adoption, thus supporting the hypotheses formulated in this study.

These findings coincide with previous studies. AI for instance is believed to have a strong impact on personalisation (Christian, Anene, Ewuzie & Iloka, 2023). This plays a crucial role for AI to be accepted (Kumar, Rajan, Venkatesan, & Lecinski, 2019), resulting in companies embracing this factor in AI adoption (Liu, Zhang & Caesarius, 2024).

Additionally, speed is considered to be AI's key strength (Nosta, 2024). This makes it a fundamental component of AI (Chowdhury & Sadek, 2012).

Interestingly, accuracy is prioritised by many companies motivating them to adopt AI (Akter et al., 2021; Kaplan & Haenlein, 2019). In the same way, customers adopt AI-integrated tools due to its precision (Seeger & Heinzl, 2018).

Furthermore, "human like interaction" is improving online services from its human-like qualities such as emotions, cognitive, critical and social intelligence (Kaplan & Haenlein, 2019).

3.5 Multiple Linear Regression

3.5.1 R square

R square is identified to be 0.730, which means that 73% of the variation of "adoption of AI" is explained by the variables: personalisation, speed, accuracy and human like interaction.

3.5.2 Multiple Linear Regression Results

Table 5. MLR Results

	Beta Value	Sig Value
Personalisation	.135	.163
Speed	-.064	.626
Accuracy	.242	.093
Human like interaction	.603	<.001

Based on the regression analysis, the most significant variable is 'human like interaction' with a Sig. value less than .001, as indicated in Table 5. The beta value is .603. This indicates that enhancing the human-like qualities of AI interactions will contribute to a strong and positive impact on AI adoption.

3.6 Descriptive Statistics

Table 6. Mean Values

Variables	Mean
Personalisation	**3.9**
1. AI-driven recommendations in online supermarkets enhance my shopping experience	3.8
2. I am more likely to use an online supermarket, if AI suggests products based on my past purchases.	4.0
3. Personalised promotions and discounts offered by AI influence my shopping decisions.	4.1
4. AI personalisation makes my online shopping journey feel more tailored and convenient	4.0
5. I trust AI to understand my shopping preferences better over time.	3.9
Speed	**3.9**
1. I prefer using online supermarkets with AI features, because they speed up the shopping process.	4.0
2. AI-powered search and filtering options help me find products faster than manual browsing	4.0
3. Faster checkout processes, enabled by AI, encourage me to shop online more frequently.	3.9
4. I am more likely to use an online supermarket, if AI reduces the time spent on order placement.	4.0
5. AI's ability to quickly suggest alternative products when items are unavailable enhances my shopping experience.	4.0
Accuracy	**3.9**
1. I trust AI in online supermarkets to provide accurate product recommendations.	3.9
2. AI-powered chatbots and customer service tools provide reliable and precise responses to my queries.	3.8
3. AI-based systems help reduce errors in order processing and delivery.	3.9
4. I am more likely to adopt AI in online supermarkets, if it ensures accurate substitutions for out-of-stock products.	3.8
5. I prefer AI-powered systems in online supermarkets, because they minimise the chances of	3.9

incorrect charges or billing issues.	
Human like interaction	**3.9**
1. I feel more comfortable interacting with AI chatbots, if they provide responses similar to human customer service agents	4.0
2. A human-like AI assistant makes my online shopping experience more engaging.	4.0
3. I am more likely to use an AI-powered online supermarket, if the chatbot understands natural language and responds conversationally.	4.0
4. AI with human-like interaction enhances my trust in online supermarkets.	3.9
5. The ability of AI to express empathy and understanding influences my decision to adopt it in online supermarkets.	3.8
Adoption of AI	**4.0**
1. AI-driven features in online supermarkets positively impact my willingness to shop online.	3.9
2. I am more likely to use an online supermarket that integrates AI for recommendations, search, and customer support.	4.0
3. AI-based automation in online supermarkets enhances my overall satisfaction.	4.1
4. If an online supermarket offers AI-powered features, I am more likely to shop online.	4.0
5. I would like to use AI tools when shopping online.	4.1

The overall mean values for the independent variables fall within the acceptable range, generally around 4.0, which implies customers consider these variables to be important in their intention to adopt AI in online shopping services. These findings are supported by previous studies on AI adoption.

Personalisation is perceived to boost engagement and revenue (Davenport & Ronanki, 2018). It is known for enhancing customer's overall shopping experience, which encourages them to make more purchases (Adam, Wessel, & Benlian, 2021). Additionally, AI's human like traits showcase the ability to enhance customer experience fostering satisfaction (Murtarelli, Gregory, & Romenti, 2020).

Brands need to ensure AI is updated with information that goes in line with customer requirements (Peham, 2023). It is recommended to update chatbots with large datasets of customer information to enable them to make informed decisions and boost customer satisfaction (Sherman, 2023).

Some users find it unappealing to interact with chatbots (Gnewuch, Morana, Adam & Maedche, 2018). Thus, conversational chatbots are perceived to boost customer satisfaction (Hsu and Lin, 2023). Moreover, to improve user impressions of human similarity, chatbots can also be given human names, photos, personalities, and be updated to react like humans (Hu, Lu, & Gong, 2021; Folstad, Nordheim, & Bjorkli, 2018).

Customers shopping experience are enhanced and found to be convenient especially when AI-powered tools are integrated (Haleem, Javaid, Qadri, Singh, & Suman, 2022). AI-integrated solutions are therefore anticipated to change the e-commerce sector, guaranteeing an upward trajectory for all retailers (Lu, Cai & Gursoy, 2019).

4.Conclusion

The correlation analysis indicates that all the variables (personalisation, human-like interaction, speed and accuracy) have a strong positive correlation with the dependent variable "adoption of AI". The regression analysis indicates that "human like interaction" is the most significant factor influencing the adoption of AI. The majority of the respondents agreed that AI will enhance their online shopping experience and were willing to adopt.

Given that human-like interaction is found to be a significant predictor of AI adoption, supermarkets should take this into account. Natural language processing (NLP) is a type of AI tool known to facilitate communication with customers, playing a major role in resolving complex problems (Stryker & Holdsworth, 2024). Interestingly, the NLP function is integrated into AI chatbots, which has transformed it to communicate like humans (Chakraborty, Kumar Kar, Patre, and Gupta, 2024), portraying traits like empathy (Mari, Mandelli, & Algesheimer, 2024).

With regard to AI's ability to enhance "personalisation", AI-chatbots can ideally be employed, as they help to provide personalised experiences, which are crucial to boost customer satisfaction (Pawaskar & Nattuvathuckal, 2024; Chandra et al., 2022; Przegalinska et al., 2019). Notably, AI-chatbots help to resolve customer queries and update customers with pertinent product information to ensure smooth order processing (Samuels, 2023). Augmented Reality (AR) is versatile in terms of providing personalised recommendations, which is essential to address customers with the right product that aligns with their expectations (Necula and Pavaloaia, 2023; Samuels, 2023). Similarly, companies use machine learning (ML) extensively because, it has the potential to enhance "personalisation", which is useful for creating successful marketing campaigns (Haleem et al., 2022). AI-personalised suggestions based on user purchasing patterns are instrumental in creating customer-targeted marketing strategies (Hayes & Downie, 2024).

Therefore, AI's ability to enhance personalisation has motivated supermarkets to adopt AI chatbots, in its online delivery services to enhance their marketing goals (Chakraborty et al., 2024). Despite these benefits, there are situations where the quality of AI suggestions may fall short of expectations. In this case, it is advised to update AI with a large amount of data to guarantee that customer requirements are met (Peham, 2023; Booch et al., 2021).

Speed is crucial to create positive customer relationships in a contemporary digital world (Chacko, 2020). Quick replies demonstrate the company's dedication to its customers, which boosts brand satisfaction, loyalty, and reputation (Hyken, 2023; Chacko, 2020). Fast speed is anticipated by most customers (Spencer, 2024; Hyken, 2023; Chacko, 2020). Thus, AI is crucial in terms of enhancing speed, as it has the ability to think faster than humans (Chen et al., 2022; Chacko, 2020). For instance, AI-chatbots provides quick assistance by effectively resolving customer queries (Pawaskar & Nattuvathuckal, 2024; Chacko, 2020; Przegalinska et al., 2019). The 24/7 availability of responding to customer queries reduces workload of companies and lessens their dependence on human agents (Chacko, 2020). Likewise, AI tools are capable of addressing different customer queries simultaneously (McClune, 2024).

Accuracy in AI refers to matching predictions with a specific set of facts or anticipated results, giving it a sense of dependability and trustworthiness. Thus, AI has the ability to enhance the concept of "accuracy", since it carefully ascertains complicated data to formulate informed decisions (Sakhvidi & Saadat, 2024). This has been possible due to its strong algorithms which accurately assess customer data (Bawack, Wamba, & Carillo, 2021; Deng, Tan, Wang, & Pan, 2019). Specifically, machine learning (ML) has the potential to solve problems, since its systems are trained to evaluate and understand information without the need of constant updates (Haleem et al., 2022).

In conclusion, AI adoption brings a lot of advantages to the online shopping experience of Sri Lankan supermarkets. The customers surveyed are willing to adopt AI enabled online delivery services to benefit from personalisation, speed and accuracy improvements related to AI adoption. Therefore, Sri Lankan supermarkets should seriously consider adopting AI into their online delivery services.

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