Perceived Advantage and Perceived Value of Service Robots on Intention to Use of Generation Z Toward Fast-Food Chain

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Abstract: As fast-food businesses perceive the idea of switching from human workers to service robots as a chance to serve customers faster and accurately, this study intends to explore the perceived advantage and perceived value of service robots on intention to use of generation Z toward fast-food chain. Utilizing a descriptive-correlational research design, data were collected through hybrid mode of survey using modified questionnaires. Purposive sampling technique was employed of which the study considered participants with age ranging from 18 to 26 years old and who had not been served by service robots in fast-food chains. Service robots were evaluated in general context, considering the benefit of using it and its value. Statistically, weighted mean, standard deviation, and correlation test were applied to analyze, evaluate, and interpret the data. The findings revealed that service robots are perceived to be advantageous and have a high value. That is, service robots are noted to be faster, polite, and patient. Provided that service robots feature the abilities to do tasks consistently and efficiently, it is observed to have the potential to reduce human errors, while improving overall productivity. The participants also showed a high level of intention to use service robots. The study further revealed that there is a direct and moderately high relationship between perceived advantage and intention to use, and perceived value and intention to use. Hence, the implementation of service robots in fast-food chains is a promising trend that has the potential to revolutionize the industry and improve customer experience.

Key Words: service robots, advantage, value, intention to use, fast-food industry

1. INTRODUCTION

In the existing era of advanced technology, the use of service robots in the fast-food industry has become increasingly popular in recent years. It becomes evident that fast-food businesses perceive the idea of switching from human workers to service robots as a chance to serve customers much faster and more accurately.

The economies are currently at a turning point, similar to the industrial revolution, but this time in the service sector (Wirtz, Kunz, & Paluch, 2021; Wirtz *et al.*, 2018). With the exponential growth of technology, humans are witnessing smarter and more powerful tools emerging at an unprecedented pace. Service robots not only have been used to save labor costs and streamline services but also to serve as an important marketing tool to attract consumers (Ivanov, Gretzel, Berezina, Sigala, & Webster, 2019).

In this day and age, generation Z is reported as highly welcoming and extraordinarily optimistic toward robots (Ranger, 2018). The first generation to have lived wholly in digital environment will surely be astounded if they experience the service provided by a robot. Generation Z have grown up in a world heavily influenced by technology. As a result, they have a greater comfort level by using technology in their daily lives.

With the emergence of service robots in the food service industry, it is important to understand how this new technology may influence their intention of using it in fast-food chains. As the world has rapidly and continually changed service in the marketplace, especially in fast-food chains, consumers tend to perceive the advantage and value of using service robots in the service of fast-food chains. Some of the renowned food chains in the Philippines have started to adopt service robots in many of their franchises, including Jollibee, McDonald's, and Dunkin Donuts.

It is crucial to consider how customers in the food chain sector engage with robots as technologies advance. Otherwise, it will be challenging for fast-food companies to successfully adopt service robots if customers are opposed to them. Considering some consumers tend to appreciate sincere happiness and effort in human labor than service robots, standards in the service industry have to be reviewed in order to fully appreciate the value and importance of emerging technologies (Meidute-Kavaliauskiene, Çiğdem, Yıldız, & Davidavicius, 2021).

As potential consumers in the fast-food chain are growing, the researchers intend to bring a clearer understanding of the perceived advantage and perceived value of service robots relative to the intention to use of generation Z toward fast-food chain. Currently, there are few fast-food establishments that have utilized service robots. Therefore, management need to know if the service robots are highly advantageous and valuable to the usage intentions of generation Z.

Given the background discussed, this study aims to determine the relationship of perceived advantage and perceived value of service robots on the intention to use of generation Z toward fast-food chain. Particularly, the study is required to answer the following research questions:

1. What is the level of advantage of service robots as perceived by the participants?

2. What is the level of value of service robots as perceived by the participants?

3. What is the level of intention to use of the participants?

4. Is there a significant relationship between the perceived advantage of service robots and the intention to use of the participants?

5. Is there a significant relationship between the perceived value of service robots and the intention to use of the participants?

1.1 Theoretical Underpinning

Technology, in all aspects, changes how people see and value things, affecting their day-to-day lives and perceptions. In the modern times, new technologies are introduced and undeniably increasing in numbers. That is, it is of great importance to continuously examine how people accept new technologies and predict how users will respond to it.

Technology Acceptance Model (TAM) has been refined over time, from measuring the level of resistance people must utilize new technologies to predicting how much these technologies will benefit them and how straightforward it is (Davis, 1989; Marangunic & Granic, 2013; Venkatesh & Davis, 2000). According to Meidute-Kavaliauskiene *et al.* (2021), this model intends to help businesses foresee how customers and its market will react to the various emerging and innovative technology, most especially that making the best use of technologies is powered by an individual's perception, characteristics, and expectations. Hence, it can be observed that TAM has an essential explanatory power in identifying reasons for uses to adopt, accept, and use new technologies (Davis, 1989; Adams, Nelson, & Todd, 1992; Marangunic & Granic, 2013; Venkatesh & Davis, 2000; Lu, Yu, Liu, & Yao, 2003).

Considering the literature, studies made significant point that people are excited about advances and transformation in technology. Although there are concerns that robots can replace humans and can lead to social deterioration, its advantages and value are still seen essential in the growth and development of any industry. Meidute-Kavaliauskiene *et al.* (2021) highlighted that advantage and value are vital elements in identifying

usage intention, similar to TAM's attributes of usefulness and ease of use. Thus, with the given model, it enables the researchers to hypothesize: (Ho1) the perceived advantage of service robots has significant relationship with intention to use; and (Ho2) the perceived value of service robots has significant relationship with intention to use.

1.2 Conceptual Framework of the Study

In the study of Meidute-Kavaliauskiene *et al.* (2021), perceived advantage and perceived value are considered elements in predicting intention to use new technologies. These variables are used for predicting and explaining the consumer adoption of new information and communication technologies. The model demonstrates how useful, easy to use, and desirable technology appears to potential consumers (Sheppard, Hartwick, & Warshaw, 1988). For this study, the same elements from Meidute-Kavaliauskiene *et al.* (2021) were employed. Accordingly, perceived advantage and perceived value served as the predictor variables, while intention to use served as the outcome variable, considering the perceptions of generation Z toward service robots in the fast-food industry. Figure 1 displays the conceptual framework of the study.

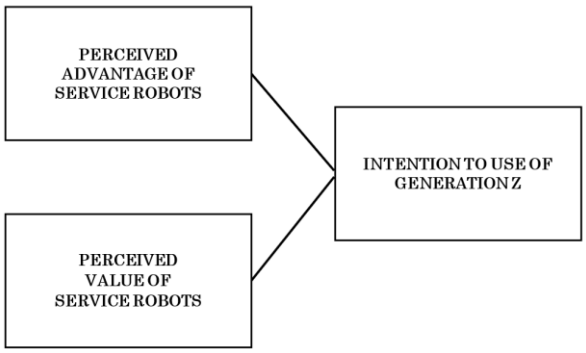

Fig 1. Conceptual framework of the study

2. METHODOLOGY

2.1 Sample and Data Collection

Considering the research objectives, this research utilized a descriptive-correlational approach. On one hand, the descriptive approach was employed to determine the level of perceived advantage of service robots; the level of the perceived value of service robots; and the level of usage intention of the participants. On the other hand, correlational approach was applied, examining the relationship between the variables.

Further, this study focused on the perceptions of generation Z in Carmona, Cavite, evaluating the nearby fast-food establishments where service robots are not yet implemented. Service robots were evaluated in general context, covering robots that are used for several jobs, such as serving, bussing, and cleaning. Likewise, this study did not cover other aspects, such as the intention and readiness of fast-food owners to implement such change.

Relative to sample, a quota sample of 60 participants were decided. The participants of the study only included generation Z who are between the ages of 18 and 26. Purposively, the participants must have a brief understanding about technologies including robots in the fast-food chain and must not have prior experience being served by service robots in the fast-food chain, making it more appropriate to evaluate the advantage and value of service robots and their intention to use it.

For data collection, the researchers gathered relevant data from the participants using a modified survey questionnaire. Using hybrid approach, face-to-face collection was done by personally handling the questionnaire to qualified participants, while online survey was done through the use of Google Forms, sending and posting the link on different online platforms, such as Facebook, Messenger, etc. In assessing the eligibility of the participants, gatekeeper questions were asked. If the participants meet all the criteria mentioned, they will be directed to take part in the study. After collection, the researchers tallied and evaluated all the gathered data. All responses were handled with full confidentiality and were used primarily to complete the study.

2.2 Research Instrument

To gather important data for the study, the researchers modified the statements from an original questionnaire of a related study, specifically from the works of Meidute-Kavaliauskiene *et al.* (2021). Applicable statements were used to develop the survey questionnaire. Particularly, the research instrument is composed of five parts. The first section of the questionnaire presented the informed consent,

where it discussed the rationale and purpose of the study, the utilization of data, and the voluntary participation of the participants. This part was primarily included for ethical considerations. The second section focused on the gatekeeper questions. The third section included 11 statements intended to determine the level of perceived advantage of service robots toward fast-food chain. The fourth section presented 5 statements which aimed at determining the level of perceived value of service robots. The fifth section intended to determine the level of intention to use of the participants, covering 7 statements. Furthermore, the researchers used a four-point Likert scale as follows: one (1) for disagree, two (2) for slightly agree, three (3) for agree, and four (4) for strongly agree.

2.3 Statistical Treatment of Data

Statistical tools for analysis and interpretation of data were used in this study. These tools include weighted mean and standard deviation, Shapiro-Wilk test, and correlational test.

In particular, weighted mean and standard deviation were utilized to determine the level of perceived advantage and the level of perceived value of service robots, and the level of intention to use of the participants.

Shapiro-Wilk test was applied to assess the normality of the distribution before deciding on what appropriate correlational test will be applied. This test, as per Mishra *et al.* (2019), is a more appropriate approach for small sample sizes, ranging from 50 to 2000. This is also a more popular and extensively used method in assessing normality. Accordingly, if the test P-value is >0.05, the data is normally distributed; if the significance value is ≤0.05, the data is not normally distributed. Based on the collected data, all of the variables underwent normality test using Shapiro-Wilk and each variable has a significant value of <0.001, signifying that the data acquired are not normally distributed.

For abnormal distribution of data, Spearman Rho correlational test was applied to determine the significant relationship between the variables under study. This was also employed to measure the strength of the relationship of the variables, where the r value of positive 1 means a perfect positive correlation and the r value of negative 1 means a perfect negative correlation.

3. RESULTS AND DISCUSSION

3.1 Perceived Advantage and Perceived Value of Service Robots

Table 1 presents the level of advantage and value of service robots as perceived by the participants.

Table 1
Perceived advantage and perceived value

VARIABLE	WEIGHTED MEAN	STANDARD DEVIATION	REMARKS
Perceived Advantage	3.02	0.63	Agree High
Perceived Value	3.11	0.63	Agree High

Perceived advantage. The result showed that the level of advantage of service robots as perceived by the participants was interpreted as high (agree) with a weighted mean score of 3.02 and a standard deviation of 0.63. This conveys that the participants demonstrate a high level of perceived advantage of service robots in that they will be faster, better with calculations, polite, and patient. Additionally, the service robots are perceived to provide efficient, accurate, and consistent services than humans. The participants believed that the service robots will be patient, no matter how many tasks are required. This is strengthened by the participants' rating of the statements, indicating that they will avoid inefficient personal contact if they use service robots. This agrees with the study of Wirtz *et al.* (2018) which emphasized how service robots may boost operational efficiency and customer service. Accordingly, service robots can perform several duties at once without showing impatience. All in all, the presence of service robots can enhance the service experience of the consumers. It further demonstrates that the use of service robots in fast-food chain is a noteworthy technological innovation that will attract customers' interest due to its perceived advantages.

Perceived value. The result showed that the level of value of service robots as perceived by the participants was interpreted as high (agree) with a weighted mean score of 3.11 and standard deviation of 0.63. This proves that the service robots will provide satisfactory experience and is worthwhile to use. Service robots also offer value for money, improve

service efficiency, and uniform service quality. The participants also believed that using service robots can improve fast-food chain service efficiency. The result runs parallel to the study of Holland *et al.* (2021) which noted that service robots have the potential to revolutionize the fast-food industry by enhancing mainly the operational efficiency, reducing costs, and improving service quality. Fast-food chains are constantly seeking ways to improve efficiency and customer satisfaction, and one potential solution is the integration of service robots into their operations. Overall, the integration of service robots in fast-food establishments has the potential to completely transform the industry by improving and focusing on efficiency and service quality. That is, the use of service robots in fast-food chains may enhance the value as perceived by the consumers with the efficiency they provide. Thus, service robot integration depicts value, enabling consumers to see their whole fast-food experience.

3.2 Intention to Use

Table 2 presents the level of intention to use of the participants considering service robots in fast-food chain.

Table 2
Intention to use

VARIABLE	WEIGHTED MEAN	STANDARD DEVIATION	REMARKS
Intention to Use	2.98	0.61	Agree High

The findings of the study revealed that the intention to use of the participants toward service robots in fast-food chain was interpreted as high (agree) with a weighted mean score of 2.98 and a standard deviation of 0.61. The participants' evaluations indicate that they intend to use service robots in fast-food chains, showcasing their willingness to adopt. Considering their utilization of the service robots in fast-food chains, the participants are also willing to recommend the same. The similar findings have been found in the study of Meidute-Kavaliauskiene *et al.* (2021) which showed that people show willingness to use service robots if given an opportunity and the service itself will be good. Consumers argue that something new might tempt them to visit a fast-food chain with a service robot on staff, but if the service was poor, they would not frequently return. In a nutshell, this proves that service robots are a great technological advancement for fast-food chain operation. Consumers, particularly those in generation Z, are likely to experience a service that comes from robots, most especially that service robots offer a new way to interact with customers.

3.3 Relationship of Perceived Advantage and Perceived Value on Intention to Use

Table 3 presents the relationship of perceived advantage and perceived value of service robots on the intention to use of the participants.

Table 3
Relationship of perceived advantage and perceived value on intention to use

VARIABLE	P-VALUE	SPEARMAN RHO VALUE	REMARKS
Perceived Advantage and Intention to Use	0.001 *Significant	0.68	Moderately High Positive
Perceived Value and Intention to Use	0.001 *Significant	0.70	Moderately High Positive

*Significance Level = 0.05

Perceived advantage and intention to use. Provided the result, the relationship between the perceived advantage of service robots and the intention to use of the participants showed a significant (P-value of 0.001) and moderately high correlation (0.68). The result also revealed that there is a direct relationship between the two and thus, if the perceived advantage increases or has a positive change, there will be a corresponding increase or positive change on intention to use service robots. As a result, there is enough evidence to support Ho1 that the perceived advantage of service robots has significant relationship with intention to use. That is, they are willing to use service robots in fast-food chains due to its numerous advantages.

Based on the results of the study of Meidute-Kavaliauskiene *et al.* (2021), consumer's perceptions of advantage regarding service robots increased their positive intention to use robots. Furthermore, in the study of Ivanov *et al.* (2019), customers believed that there would be a shorter waiting period, which would be more convenient than using human employees for services in business. This means that the customers

prefer using robots for convenience to avoid inefficient personal contact and to provide accurate and fastest service in the fast-food chains. Nevertheless, if the customer refuses to acknowledge that technological innovation has been made, they cannot take the opportunity of the potential advantage of service robots. Overall, service robots are significant, indicating that people are becoming more accepting of service robots and are more open to using them. This could potentially lead to increased efficiency and cost savings for fast-food chains, as well as improved customer experience.

Perceived value and intention to use. The result revealed that there is a significant (0.001) and moderately high correlation (0.70) between the perceived value of service robots and intention to use of the participants. The two variables also showed a positive and direct relationship in which when the perceived value of service robots increases, the intention to use them will also increase. Therefore, there is enough evidence to support Ho2 that the perceived value of service robots has significant relationship with intention to use. This further implies that when service robots are seen to be valuable in a way that it can improve fast-food chain service efficiency and can guarantee a uniform service quality, people will have the intention to use them.

The outcome of the study is aligned with the study of Meidute-Kavaliauskiene *et al.* (2021), which highlighted that the use of service robots represents an innovative and technologically advanced approach in the fast-food chains. Generation Z, being digital natives, is more likely to perceive service robots as a valuable addition to their dining experience (Ivanov *et al.*, 2019). The convenience and efficiency provided by technology-based service, including service robots, contribute to a positive perceived value and intention to use among generation Z. Overall, the consumers' intention to use service robots is greatly determined by its perceived value, particularly if service robots will provide a satisfactory experience and offer value for money. This proves that fast-food chains that offer service robots should focus on demonstrating the value of their service to potential customers, as this will increase the probability that customers will be interested in using them.

4. CONCLUSION

Given all the discussion, the study concluded that generation Z highly perceived the advantages of service robots, recognizing their speed, good calculations, politeness, patience, and ability to provide efficient, accurate, consistent, and error-free services. Additionally, the perceived value of service robots is deemed high, indicating agreement on their value, consistent service quality, efficiency, and value for the money. Participants showed a strong intention to use service robots, highlighting their efficiency, convenience in serving, and potential to enhance customer experience and operational efficiency in fast-food chains. Furthermore, the relationships between perceived advantage and intention to use, as well as perceived value and intention to use, underscore the potential benefits of integrating service robots in fast-food chains to elevate customer experience and service quality.

More so, this study's findings suggest that generation Z's acceptance of service robots in fast-food chains can be enhanced by recognizing the advantages and value they offer. By embracing such technological advancements, generation Z can benefit from the efficiency, accuracy, and consistent service quality that service robots bring to the dining environment. As to potential consumers across all age groups, they are encouraged to explore the benefits of service robots given their highly perceived advantages, such as efficient and accurate service and an overall enhanced service experience. That is, recognizing the value and convenience that service robots provide can lead consumers to adopt these technologies and improve their fast-food experience.

Furthermore, it is recommended that marketers stay up-to-date with the latest trends and innovations that have the potential to enhance the customer experience, such as the integration of service robots in fast-food chains. Adapting to market innovations and showcasing the benefits of service robots can help marketers keep up with the trend and drive revenue growth for fast-food chains. As to fast-food chains, the study's findings suggest that integrating service robots into their operations can enhance customer experience and operational efficiency. By showcasing the convenience, accuracy, and time-saving benefits of these technologies, fast-food chains can address customer concerns and increase their intention to use service robots. Moreover, this study can serve as a foundation for

further investigations into the adoption of service robots in the fast-food sector, contributing to the ongoing development and implementation of these innovative solutions.

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