

Contact-Free Services

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Contact-free services means there is no physical contact between employees and customers, for example kiosks, service robots, and Siren Orders. These services are useful in various fields such as restaurants, cafes, multiplex shopping malls, hospitals, and theaters. In fact, such service methods are made using artificial intelligence (AI) technology and widely used in tourism, hospitality, and various other industries.

Keywords: contact-free service value ; personal norms ; social norms ; menu price ; food service industry

1. Introduction

We live in the era of the Fourth Industrial Revolution, wherein various data, artificial intelligence technology, and physical objects are interconnected ^[1]. At the same time, in dealing with various social and global crises such as the COVID-19 pandemic and rising labor costs, everyday life has changed and people have adapted, assimilating the core values of digitalization and sustainability ^[2]. One such adaptation is the emergence of contact-free services. US companies have forecasted that AI service usage will increase to approximately 60% by 2022 ^[3]. As of 2020, contact-free consumption has increased due to COVID-19 according to 71% Koreans, and a younger population prefers contact-free services ^[4]. Based on advanced technology, these contact-free services are essential because they save time and labor, prevent the spread of viruses ^[5], and store large amounts of information ^[6]. AI services have been rapidly developing, including the formulation of customized services based on a massive amount of database analysis ^[7]. Gursoy et al. ^[7] explained that AI services not only provide fast and accurate services but also increase interactions between firms and customers and resolve the increasing cost of labor. According to Travelzoo ^[8], about 75% of customers were satisfied with the services provided by the robot and believed that AI service methods would improve the service quality.

In contrast, Adam et al. ^[9] argued that AI services are yet to meet customers' expectations. Therefore, there is disagreement among scholars on the satisfaction level of contact-free services. Several studies have been conducted on contact-free service value in the service sector. Marinova et al. ^[10] conducted a study applying the deliberate and pragmatic learning theory to enhance the efficiency and effectiveness of AI services at the service frontline, finding that smart technology learning has a significant mediating effect on the relationship between employees and customers. Bolton et al. ^[11] studied customers' AI service experiences from an integrated perspective of social, physical, and digital environments and derived a total of eight duality concepts that differ in business-to-customer and business-to-business relationships. Wirtz et al. ^[12] studied the role of robots in the service environment and analyzed customers' beliefs and behaviors on such robots from a systematic perspective. In addition, customers' acceptance of AI devices ^[7], AI-based chatbot services ^[9], and comparative studies on service robots and kiosks ^[13] have been conducted. As such, prior studies on contact-free services have varied with regard to application fields, detailed topics, and theories applied, and they include many technical analyses as well as qualitative studies. Extensive consideration of prior studies has confirmed that quantitative studies focused solely on the restaurants' contact-free service value in the areas of food service, hotels, and tourism have been carried out on a limited basis.

In the context of this social trend, Stern et al. ^[14] emphasized that the value-belief-norm theory appropriately describes certain social phenomena. In particular, they explained that values and norms are directly related concepts that predict customer behavior ^[14]. Humans feel uncertainty and urgency about their first social experiences ^[15]; therefore, by interacting with each other, norms guide their behaviors to produce new meanings and structures ^[15]. Furthermore, norms are the most essential characteristics of normative messages, and understanding them is fundamental ^[16]. This study analyzes both personal and social norms, which predict an individual's future behavior more accurately ^[17]. Moreover, it has been observed that social norms affect personal norms ^[18]. Therefore, it is important to analyze values, norms, and customers' behavioral intentions in the context of changes in service methods to facilitate the development of a sustainable restaurant industry. So far, several scholars have proved the relationship between values and norms in other

fields ^{[19][20][21][22]}; however, studies that assess this association in reference to contact-free services offered by restaurants remain scant.

In addition, Zhong and Moon ^[23] stated that price signifies the value of a product, which directly impacts consumer behavior. Similarly, Chen et al. ^[24] explained that price acts as a stimulus that alters consumer behavior. Consequently, this study seeks to verify the moderating effect of menu price on the relationship between contact-free service value and norm theory. In summary, this study is quite meaningful in that it applies extended norm theory to clearly demonstrate customer behavior changes regarding contact-free service value in the food service sector, applying price, which acts as an important variable in customer consumption behaviors, as a moderator. Furthermore, this study is valuable because it is an attempt to assess the role of personal and social norms in the relationship between contact-free service value and customer behavior to reduce the research gap between existing studies and to contribute to the facilitation of the sustainable management of the food and hospitality industry. Customer behavior studies on contact-free services are expected to contribute in a variety of ways to the building of a more advanced contact-free service environment in the future.

2. The Relationship between Contact-Free Services, Social and Personal Norms, and Customers' Behavior for the Sustainable Management of the Restaurant Industry

2.1. Contact-Free Service Value at Restaurants

Complex social issues such as the COVID-19 pandemic and the Fourth Industrial Revolution have created a new service environment ^[2]. Advanced AI has been created to perform human tasks as effectively as possible in the form of computer systems, machines, or robots ^[25]. It enhances service efficiency and provides special service experiences for customers ^[26]. Berry ^[27] emphasized that new service strategies are the key to remain competitive. Carù and Cova ^[28] observed that satisfactory AI services positively change the customers' behavioral intentions toward the company.

According to Prentice and Nguyen ^[26], AI-based services enhances customer engagement more than human services in the hotel industry. Meanwhile, Adam et al. ^[9] observed customers' dissatisfaction toward AI services for many reasons. Belanche et al. ^[5] conducted a qualitative study on the benefits of service robots in the service sector and showed that service robots increase productivity and reduce costs. Comparing the use of robots and kiosks in shopping environments, Brengman et al. ^[13] found that customers were more attracted to service robots than kiosks. Additionally, the use of robots was found to be more positive. Huang and Rust ^[29] studied the role of AI in the service field and explained that service human resources should be gradually reduced as AI advances. Kim et al. ^[30] studied robot services in the hotel sector and found that due to the experience of COVID-19, customers prefer hotels with robot workers; meaning, robotic services were positively valued. McLeay et al. ^[31] studied robot services in the age of machines and understood what needs to be supplemented for the successful application of contact-free services in the future. They argued that customers should be constantly informed about the safety and advantages of robots.

Therefore, studies on AI-based contact-free services have been conducted in various fields; particularly qualitative studies on contact-free services and technical skills. However, this current study assesses contact-free service value in the food service industry which has, hitherto, been scant.

2.2. Relationship between Contact-Free Service Value and Personal Norms

In a study on reducing the use of personal cars, Nordlund and Garvill ^[32] confirmed that environmental value positively affects people's personal norms. Chua et al. ^[33] revealed that altruistic values positively affect personal norms in the context of pro-environmental agriculture. Roos and Hahn ^[20] studied collaborative consumption and determined that altruistic value positively affected personal norms. Ateş ^[21] observed that biospheric value positively affects personal norms in the context of pro-environmental behaviors. According to Engel et al. ^[22], relational marine value positively affects people's personal norms regarding marine conservation.

Consequently, most relevant studies have observed a positive effect of service value on respondents' personal norms. Based on these findings, the following hypothesis is proposed: *Restaurants' contact-free service value positively affects customers' personal norms in the contact-free services environment.*

3. Conclusions

Herein involves contact-free services, which are becoming more common in our daily lives due to the development of artificial intelligence technology, rising labor costs, and the impact of COVID-19 in the Fourth Industrial Revolution era. In order to reduce the research gap in consideration of prior related studies, this study focused on the contact-free services value in the food service sector. We applied norm theory, which best describes human behavioral changes for new social phenomena, and specifically extended it to comprehensively consider personal and social norms to more clearly predict behavioral changes. In addition, moderating effect analysis was conducted on prices, which have a strong impact on human consumption behavior, to produce important results. The contact-free service value and social norms each had a positive effect on personal norms, personal norms and social norms each had a positive effect on the customers' behavioral intentions, and the moderating effect of menu prices was also partially confirmed.

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