THE IMPACT OF SERVICE TECHNOLOGY ATTRIBUTES ON CUSTOMERS’ BEHAVIORAL INTENTIONS IN CASUAL DINING RESTAURANTS

A Project
Presented to the
Faculty of
California State Polytechnic University, Pomona

In Partial Fulfillment
Of the Requirements for the Degree
Master of Science
In
Hospitality Management

By
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2022
PROJECT: THE IMPACT OF SERVICE TECHNOLOGY ATTRIBUTES ON CUSTOMERS’ BEHAVIORAL INTENTIONS IN CASUAL DINING RESTAURANTS

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ABSTRACT

Restaurant owners must provide distinctive and practical services to stand out in the fiercely competitive food service industry. Since February 2020, the food service industry has faced unprecedented challenges associated with the spread of COVID-19 across the world. Restaurant adaptability to technology became more critical than before. This study aims to discover the impact of various service technologies attributes on customers’ behavioral intentions within casual dining restaurants. Based on previous literature and the Stimulus-Organism-Response (S-O-R) framework, this study includes nine technology attributes within three categories (pre-dining, on-site, and post-dining service technology attributes). This study used a quantitative method, a questionnaire-based survey, and was distributed via Amazon Mechanical Turk. A total sample of 161 respondents was recruited for the study. The results of multiple regression analyses indicated that Pre-dining Service Technology Attributes and Post-Dining Service Technology Attributes positively affect customers’ readiness to frequent a restaurant, favorable word-of-mouth, and propensity to recommend in a casual dining restaurant context.

Keywords: Customers’ behavioral intentions, Service technology attributes, Casual dining restaurant, Stimulus-Organism-Response (S-O-R) framework.
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CHAPTER 1: INTRODUCTION

Given how competitive the food service market is, it is crucial for business owners to provide distinctive and practical services. Restaurants strive to increase their customer-centeredness, securing repeat business. Customers’ behavioral intentions is critical in the restaurant industry, owing to its positive relationship with sales and brand loyalty. Repeat patronage implies that a business preserves its existing clientele. Moreover, restaurant brand loyalty can result in an increase in new customers through referrals (Barber et al., 2011). Customers’ behavioral intentions contributes directly to the restaurant’s bottom-line measures. It is directly related to improved financial performance, long-term business survival, and positive word-of-mouth marketing (Moolman, 2011).

Since February 2020, the food service industry has faced the unprecedented impact associated with the spread of COVID-19 across the world (World Health Organization). The United States and other countries are facing a grim situation associated with a slump in the productivity of the hospitality sector, and a high number of layoffs in the industry (Huang, Velasco, Marsh, & Workman, 2021). According to the National Restaurant Association (2020), across the U.S., eight million restaurant employees have been laid off or furloughed. Four in ten restaurants have ceased their operations, and some have no hope of reopening. As a result, economists have suggested that restaurants need to reassess their business models to endure the current economic crisis (Tan, 2020). Since April 2021, most of the states in the U.S. were fully open to all indoor entertainment businesses, including dining restaurants, but "three out of every four
restaurant owners now report employee hiring and retention as their greatest difficulty” (Smart, 2021). Due to labor shortage issues, restaurant employees have reported burnout. On this note, how to balance job demand, ensure customer satisfaction, and sustain current employees’ satisfaction to provide quality service is the major issue that operators are facing. Meanwhile, some restaurant businesses are making more profits than before, and most of them are using technology to execute some functions (Haddon, 2020; Haddon & Rana, 2020). Different innovative technologies are available in the market, which restaurants can use to give customers a better dining experience while easing the labor shortage crisis (Duffy, 2014).

Restaurant service technologies that increase the speed or convenience of the dining experience result in augmented customer satisfaction and patronage (Ko, 2020). Restaurant adaptability to technology became more critical in 2020 to date than before. The financial challenges concomitant with COVID-19, coupled with the increasing dynamism in the business context, have forced companies, small and big, to consider technology integration as a successful move. The ability to integrate technology into corporate operations defines the success or failure of present-day firms and restaurants (Ninaus, Diehl, Terlutter, & Huang, 2015). Technologies that resolve challenges related to physical access have a positive impact on customer behavior. For instance, customers have a positive attitude toward food delivery applications due to the convenience they create (Aslam et al., 2021). Restaurant service technologies improve customers’ dining experiences, increasing their likelihood of making future purchases.

This study aims to identify service technology attributes for the casual dining industry based on extant literature. There are existing articles about technologies in the
food service industry, but with the situation going on worldwide, people may re-evaluate what’s important for them when they choose restaurants. Most previous studies assessing customers’ behavioral intentions toward restaurant service technologies were conducted in the pre-pandemic period. Although there are recent studies conducted during the COVID-19 era, most focus on specific technologies, as opposed to technology deployment in all facets of the restaurant business. In order to close this gap, this study broadens its focus to include nine service technology criteria across three categories (pre-dining service technology attributes, on-site service technology attributes, and post-dining service technology attributes). This study provides guidance to business owners on how to improve technology deployment in their establishments.
2.1 Casual Dining Restaurants

Casual dining restaurants refer to a category of restaurants that offer moderately priced dining services in a relaxed atmosphere (Prayag, Taheri, & Ekiz, 2019). These establishments straddle the fine dining and fast-food spectrums. On the one hand, they provide a relaxed environment for their clientele, similar to fast-food restaurants. Their food is more expensive than fast food but cheaper than fine dining restaurants (Camillo, 2021). On the other hand, they provide table service similar to fine dining restaurants. They also offer a selection of alcoholic drinks, including a wide selection of beers and a few wines. These restaurants target families as their primary market (Kowalczyk & Derek, 2020). Therefore, casual dining restaurants are family-oriented restaurants falling in between fast food and fine dining restaurants in terms of pricing, menu, and service environment.

2.2 Customers’ Behavioral Intentions in the Restaurant Industry

Customers’ behavioral intentions includes customers stating positive things about the business (word-of-mouth), recommendations about the business to others, and purchasing/patronage intention (Zeithaml et al., 1996; Bowen & Chen, 2001; Bufquin et al., 2017). “Behavioral intentions refers to consumers executing specific actions or exhibiting behavioral tendencies toward products or an enterprise.” (p118, Tsaur, Luoh, & Syue, 2015)

According to Alao et al. (2020), restaurant location, the convenience of reach, security, and food quality are the primary determinants of consumers’ behavioral
intentions. On the other hand, Olise et al. (2015) determined service quality, restaurant atmosphere, perceived value, and consumer demographic factors, to be the key determinants of consumer purchase intention. Consumers patronize a business’s products or services a single time or repeatedly, depending on multiple factors. In certain contexts, the term can be used interchangeably with customer loyalty, although patronage precedes loyalty (Nwadigoho & Ahiaye, 2021). In restaurants, patronage intention refers to the intention to dine in a restaurant, order food remotely, or recommend others to visit it (Njite et al., 2015).

Technology plays a critical role in influencing customers’ behavioral intentions in the restaurant industry. For example, Brewer and Sebby (2021) reported a significant but indirect impact of online menu apparel and informativeness on purchase intention. Customers’ desire for food and perception of service convenience mediated the effects. Aslam et al. (2021) assessed customers’ perceptions of food ordering on food delivery applications. They discovered widespread intentions in favor of technology. The behavioral intentions of the applications was influenced by the customers’ perceived value of their usefulness (Aslam et al., 2021).

2.3 Service Characteristics and Technologies support

The hospitality sector is a service sector, which is unique from the manufacturing sector in that it has several distinctive features. According to Kandampully, Mok & Sparks (2001), there are four imperative characteristics: inseparability, intangibility, variability, and perishability. Inseparability means production and consumption of services occur simultaneously, for which both the buyer and the seller must be present. Employees and customers are both parts of the service. Intangibility means a service does
not have a physical dimension, so the service cannot be displayed and the customers cannot evaluate the product before they buy it. Since customers have to pay first and then experience service, it causes customer uncertainty. Variability means service lacks uniformity, and it fluctuates as a result of human factors, situations, performance, and emotions. It is unfeasible to receive identical service each time. Perishability means service cannot be kept in stock if the sale did not happen and the revenue will be lost forever. It is the hotel’s priority to maximize revenue.

Utilizing technology to deliver services to customers may minimize considerable service characteristic ambiguity. Foodservice industry started to value technology as business innovation, and there are 74% of restaurant operators considering increasing their investment in technology use (Lorden and Pant, 2015). Technologies can bring many benefits to the food service industry, such as a POS system makes the ordering and paying process shorter; kitchen process systems can make the work more accurate and decrease food waste; an online reservation system can save customers waiting time, and a labor-management system can save money and time on employees’ management (Kimes 2008). By implementing or providing useful technology tools, restaurants can increase food service quality and offer a better experience to customers.

**H1:** The pre-dining service technology attributes will have a positive impact on customers’ behavioral intentions within casual dining restaurant?

**H2:** The on-site service technology attributes will have a positive impact on customers’ behavioral intentions within casual dining restaurant?

**H3:** The post-dining service technology attributes will have a positive impact on customers’ behavioral intentions within casual dining restaurant?
2.4 Theoretical Background and Factor Development

2.4.1 Stimulus-Organism-Response (S-O-R) Framework

The stimuli-organism-response (S-O-R) framework guided the current study. The S-O-R framework argues that “external stimuli (S) affect the internal states (O) and subsequent behavior responses (R)” (Ahn & Seo, 2018, p. 110). It posits that interaction with a stimulus affects a person’s cognitive and emotional states, influencing their behaviors (Ahn & Seo, 2018). S-O-R presumes that stimuli in the consumption environment influence consumers’ behavioral intentions. Technology is one of the stimuli whose effects can be tested using the framework. Technological influences emotional and mental states in people who experience them and affect their intentions to adopt them. S-O-E’s association with consumer behavior and technological factors makes it a well-established framework for researching the relationship between the two variables (Ahn & Seo, 2018). Using the S-O-R framework, the restaurant service technology was categorized into pre-dining, on-site, and post-dining service factors. The

*Figure 1 Technology service factors and customers’ behavioral intentions*
dining experience constitutes three unique stages critical to the overall experience (Wijaya et al., 2013; Wijaya, 2014; Richterová, 2016). The pre-dining experience represents the customer’s expectations regarding the food and service. On the other hand, the on-site experience refers to the customer’s perception when eating the food and enjoying the services. Lastly, the post-dining experience represents the satisfaction and behavioral intentions after eating the food and enjoying the service (Wijaya et al., 2013). Fitting these definitions into the S-O-E framework, pre-dining, on-site, and post-dining service technologies relates directly to the stimulus, organism, and response.

2.4.2 Factor 1: Pre-dining Service Technology Attributes (Stimulus)

**Online Reservation.** Online restaurant reservation platforms started in 1998 and have grown significantly in recent years (Latona, 2016). Customers can make reservations from the comfort of their homes and arrive at the restaurant to find tables and meals prepared. The increased mobile technology adoption and implementation of online reservation platforms by restaurants have resulted in more customers making reservations (Latona, 2016). Customers' likelihood to make online reservations is influenced by multiple factors. According to Lien et al. (2015), customers base their online reservation decisions on brand image, price, and perceived value. Online reservation provides customers with e-service, and both online reservation and customer online ordering programs are a part of self-service technology (Schaarschmidt & Höber, 2017). Restaurants that provide more and better e-service will offer customers more options besides contact service, face-to-face service, or phone service.

**The menu on Mobile App/Website.** The website experience influences customers’ pre-dining experience, affecting their purchase and engagement intentions.
Customers are influenced by informational attributes such as menus, service attributes, and technical attributes relating to navigation. A positive website experience results in higher customer engagement intentions (Le & Chen, 2022). A positive website experience also increases customer purchase intent. Online food menus play a significant role in informing customers about the available food options. Menus found on mobile apps enable customers to learn about new items and order before arriving (Liu & Lin, 2020). Menus on a restaurant’s website or an online food ordering platform significantly impact consumer purchase intention (Brewer & Sebby, 2021). Online menu availability and attributes play a critical role in influencing consumer behavior.

**Discovering Platforms for information.** Technological advancement led to the growth of restaurant review websites, such as Yelp, Google Maps, OpenTable, and Zomato. Potential customers use reviews on these websites as an important source of information on places they intend to dine (Fogel & Zachariah, 2017; Mathayomchan & Taecharungroj, 2020; Salehi-Esfahani & Kang, 2019). Customers use this information to inform their dining decisions. The reviews are considered an accurate representation of the restaurants (Salehi-Esfahani & Kang, 2019). Luca (2016) found that an increase in a restaurant’s rating on review websites significantly increases revenue. Therefore, customers use review websites as a primary source of information to guide their dining decisions.

**2.4.3 Factor 2: On-site Service Technology Attributes (Organism)**

**Wi-Fi (wireless networks).** Guests nowadays consider “wifi availability, online reservations, and consumer ordering programs” as the most important restaurant technologies which affect their dining experience (Toast report 2019). Cobanoglu et al.
(2012) reported technology-savvy customers’ preference for restaurants with Wi-Fi accessibility over those without it. These customers were also more likely to return to restaurants with Wi-Fi service (Cobanoglu et al., 2012). Similarly, Reyes-Menendez et al. (2018) established a positive correlation between Wi-Fi services and customer satisfaction in the restaurant industry. High customer satisfaction led to increased loyalty (Reyes-Menendez et al., 2018). Wi-Fi availability is a critical determinant of customer satisfaction and future consumption behavior in the restaurant business.

**Self-ordering system.** Ahn, & Seo (2018) observed that restaurant self-service technology (SST) can increase customers’ positive emotional reactions and bring customers enjoyment. The self-ordering system can be available through smartphones, touch screen pads, or kiosks screen. SST increases customers’ involvement, empowering them in the service delivery process (Na, Yang, & Lee, 2021). Technology-savvy customers enjoy interactions with SST, making them more accepting of this service model than services provided by staff. However, SST acceptance and related satisfaction are influenced by technology attributes as perceived by the customer. Notably, customers are more accepting of SST in a restaurant if it is characterized by ease of use, pleasure, and reliability (Nilsson et al., 2021). SST contributes to higher customer satisfaction by bridging service delivery gaps in restaurants. Technology can improve service quality, speed, and affordability (Shiwen et al., 2021). The self-ordering system can improve service experience and customer satisfaction.

**Mobile NFC payment system (Apple Pay).** Restaurants are implementing cashless payment methods in an effort to improve customer experience and support other digitization practices, such as Apple Pay. Previous studies have provided preliminary
findings on customer perceptions about the emerging cashless payment systems.

According to Furtado et al. (2017), restaurant customers have a positive attitude toward mobile payment applications and remote payment services. On the other hand, Cobanoglu et al. (2015) found that customer attitudes toward these payments have improved over the years, but customers still harbor security concerns. Lastly, Dy-Tioco (2021) found that customers currently using cashless transactions in restaurants have a positive attitude towards them, while those unfamiliar with the process are willing to learn. The customers’ intention to use the new payment systems is influenced by the technology’s compatibility with users’ lifestyles, security concerns, and usefulness. Most customers are willing to use these payment services if security concerns are addressed (Shatskikh, 2013). Restaurants have implemented cashless payment systems, which have experienced a positive reception from customers.

2.4.4 Factor 3: Post-Dining Service Technology Attributes (Response)

Social media and other review websites

Repurchase intent and word-of-mouth intent were among the customers’ behavioral intentions; both are outcomes of customer satisfaction (Lee, Lee, & Joo, 2015). Customer satisfaction is an important factor for business; it can lead to loyal customers which provides a positive word-of-mouth intention and repurchase intention. Customer dissatisfaction increases the likelihood that they won't return, which is counter-productive for business (Kruger & Mostert, 2015). Because of the popularity of the internet and how easily and frequently customers use mobile phones, the most common word-of-mouth can be online reviews.
Instagram, Facebook, and other social media are important tools for customers to spread their thoughts about any restaurant. Google My Business, Yelp, and OpenTable are examples of restaurant review websites. A positive or negative review may be one of the important elements that affect new customers’ purchase intention (Shih, Sresteesang, Dao & Wu, 2018).

**Rewards program.** Reward programs are a marketing strategy used by restaurants to influence repeat purchases. “Subway’s Electronic Sub Club Card program, for instance, shows that the average reward member spends almost 50 percent more per transaction compared to the average non-member” (Jang & Mattila, 2005, p. 42). These programs offer benefits, such as discounts and other financial incentives, to customers to encourage repeat business. Rewards programs in the restaurant industry are aimed at influencing customers’ purchase intention positively. However, the effectiveness of the programs in increasing customer loyalty is questionable (Wijaya, 2005). Restaurant businesses can utilize reward programs' availability on the mobile app/mobile wallet to increase customer patronage intent.
### Table 1: Service Technology Attributes

<table>
<thead>
<tr>
<th>Factor 1 Pre-dining Service Technology Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online reservation</td>
</tr>
<tr>
<td>The menu on Mobile App/Website</td>
</tr>
<tr>
<td>Discovering Platforms (yelp, open table, Google Maps, etc.) for information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 2 On-site Service Technology Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wi-Fi (wireless networks)</td>
</tr>
<tr>
<td>Self-ordering system</td>
</tr>
<tr>
<td>Mobile NFC payment system (Apple Pay)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 3 Post-Dining Service Technology Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social media for writing reviews</td>
</tr>
<tr>
<td>Reward program</td>
</tr>
<tr>
<td>Restaurant review websites</td>
</tr>
</tbody>
</table>
CHAPTER 3:  
METHODOLOGY

3.1 Study Design and Sample

This study used a quantitative method, a questionnaire-based survey, to investigate the importance of each service technology attribute to customers’ behavioral intentions. The questionnaire was distributed once via Amazon Mechanical Turk (MTurk) to casual dining restaurant customers in the U.S. MTurk is a crowdsourcing marketplace provided by Amazon. One of the application’s functionalities is conducting surveys for different purposes. Users can create surveys directly on the site or link to other survey tools (Amazon Mechanical Turk, 2019). In this study, the survey was created directly on the link to solicit views from selected participants. MTurk was selected for its aptness in meeting the study's needs.

All participants must have at least a one-time dining experience with casual dining restaurants within 12 months. According to Tabachnick and Fidell (2001, p. 117), a multiple regression analysis sample size formula is “N > 50 + 8m, where: m = number of independent variables”. This study required the sample size should be greater than 114. A total sample included 161 respondents.

3.2 Items Development, measurements, and Questionnaire

The introduction of the questionnaire provided the background and purpose of this study. A screening question was included to ensure that respondents have patronized casual dining restaurants at least once during the past 12 months.

The technology service attributes were categorized into three factors: pre-dining service technology attributes, on-site service technology attributes, and post-dining
service technology attributes. The study provided detailed explanations of the technological attributes for respondents to better understand each attribute’s function. A 7-point Likert scale measurement was used to indicate respondents' level of agreement (1= strongly disagree, 7=strongly agree) on each attribute. The measurement questions were referenced based on validated items from previous articles: Schaarschmidt & Höber (2017), Brewer & Sebby (2021), Fogel & Zachariah (2017), Salehi-Esfahani & Kang (2019), Cobanoglu et al. (2012), Na, Yang & Lee (2021), Chen & Wang (2022), Hydock, Chen, & Carlson (2020), Ha, & Stoel (2014); some questions were adopted with wording modified.

The study used a method proposed by Hanks et al. (2017) to quantify three aspects of customers’ behavioral intentions: readiness to frequent a restaurant, favorable word-of-mouth, and propensity to recommend. It was measured by a 7-point Likert scale (1= strongly disagree, 7= strongly agree). Participants were requested to respond to behavioral intention questions based on their intended level.

A set of demographic questions were provided at the end of the questionnaire, including gender, age, education level, ethnicity, marital status, and monthly household income.
CHAPTER 4:

RESULTS

4.1 Reliability Scale Result

Cronbach’s Alpha test confirmed the internal reliability of the variables (Pre-dining CA = 0.891 > 0.7; On-site CA = 0.877 > 0.7; Post-dining CA = 0.895 > 0.7; Behavioral intentions CA = 0.876 > 0.7). The answers to the questions are highly correlated (high internal consistency).

Table 2: Results of the reliability test (Cronbach’s Alpha)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-dining Service Technology Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online reservation</td>
<td>5.49</td>
<td>1.22</td>
<td>0.891</td>
</tr>
<tr>
<td>Online Menu</td>
<td>5.60</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Discovering Platforms</td>
<td>5.52</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>On-site Service Technology Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wi-Fi availability</td>
<td>5.60</td>
<td>1.18</td>
<td>0.877</td>
</tr>
<tr>
<td>Self-ordering system</td>
<td>5.55</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Mobile Payment</td>
<td>5.54</td>
<td>1.28</td>
<td></td>
</tr>
<tr>
<td>Post-Dining Service Technology Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social media</td>
<td>5.41</td>
<td>1.30</td>
<td>0.895</td>
</tr>
<tr>
<td>Review Website</td>
<td>5.54</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>Mobile reward program</td>
<td>5.65</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>Behavioral Intentions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit</td>
<td>5.50</td>
<td>1.22</td>
<td>0.876</td>
</tr>
<tr>
<td>Prefer</td>
<td>5.51</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td>Recommend</td>
<td>5.79</td>
<td>1.04</td>
<td></td>
</tr>
</tbody>
</table>
4.2 Demographic Characteristics

The demographic frequency table shows the purpose-related characteristics of 161 respondents. The sample included 67 female respondents (41.6 %) and 94 male respondents (58.4%). The largest age group of respondents was aged between 18-29 (n=56, 34.8%), followed by respondents aged between 30-39 (n=48, 29.8%); There were only two respondents aged 60 and older (1.2%). The majority of survey participants (76.6%) were bachelor's degree holders (n=125), while the table shows 27 respondents with master's degrees or higher (16.7%). Caucasian people make up the majority of respondents (n = 132, 82.0%), followed by Asian people (n = 18, 11.2%). The table shows the majority of the respondents earned an annual income of $30,000 to $49,999 (n=67, 41.6%), followed by $50,000 to $69,999 (n=38, 23.6%). As for marital status, 134 respondents were married (83.2%); 25 respondents were never married (15.5%), and 2 respondents were divorced (1.2%)
### Table 3: Demographic Characteristics

<table>
<thead>
<tr>
<th>Socio-Demographic Variable</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>94</td>
<td>58.4</td>
</tr>
<tr>
<td>Female</td>
<td>67</td>
<td>41.6</td>
</tr>
<tr>
<td>Total</td>
<td>161</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>56</td>
<td>34.8</td>
</tr>
<tr>
<td>30-39</td>
<td>48</td>
<td>29.8</td>
</tr>
<tr>
<td>40-49</td>
<td>36</td>
<td>22.4</td>
</tr>
<tr>
<td>50-59</td>
<td>19</td>
<td>11.8</td>
</tr>
<tr>
<td>60 and older</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>161</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School Graduate</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Some Colleges</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Bachelor’s degree (4-year)</td>
<td>125</td>
<td>77.6</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>26</td>
<td>16.1</td>
</tr>
<tr>
<td>Doctoral degree or above</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>161</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Ethnic Background</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>132</td>
<td>82.0</td>
</tr>
<tr>
<td>African American</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Asian</td>
<td>18</td>
<td>11.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>161</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Annual Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $30,000</td>
<td>19</td>
<td>11.8</td>
</tr>
<tr>
<td>$30,000 to $49,999</td>
<td>67</td>
<td>41.6</td>
</tr>
<tr>
<td>$50,000 to $69,999</td>
<td>38</td>
<td>23.6</td>
</tr>
</tbody>
</table>
$70,000 to $99,999  |   34  |   21.1  
More than $100,000   |   3  |   1.9  
Total                |   161 |   100.0  

Marital Status  |  |  
Married           |   134 |   83.2  
Divorced          |   2   |   1.2   
Never married     |   25  |   15.5  
Total             |   161 |   100.0  

4.3 Data Analysis:

A multiple regression analysis was used to find the relationship between the independent variable and dependent variable by SPSS to test the three hypotheses. Multiple regression is a “method of selecting variables for inclusion in the regression model that starts by selecting the best predictor of the dependent variable” (Hair, Anderson, Tatham, & Black, 1998, p. 147). Regression analysis is a statistical method for measuring the existence of relationships between variables. The analysis determines the independent variables that impact a given dependent variable. Multiple regression analysis determines the relationship between one dependent variable and multiple independent variables. In this study, the approach was used to determine the relationship between customers’ behavioral intentions (dependent variable) and service technology attributes (independent variables) in casual dining restaurants, which included Pre-dining Service Technology Attributes (H1), On-site Service Technology Attributes (H2), and Post-Dining Service Technology Attributes (H3). The approach was selected because it determines the existence and strength of relationships between variables. The Conceptual Model is shown in Figure 1.
4.4 Hypotheses Testing

The variance inflation factor indicates no multicollinearity issue in this model (VIF<10), and thus all three independent variables can be kept (Pre-dining Service Technology Attributes VIF=2.500; On-site Service Technology Attributes VIF=2.569; Post-Dining Service Technology Attributes VIF=2.995).

The three Service Technology factors combined explain 63.1% of the variance of customers’ behavioral intentions (R square=0.631, p<0.05).

The results indicated that Pre-dining service technology attributes (H1) and post-dining service technology attributes (H3) have a significant impact on customers’ behavioral intentions. Pre-dining service technology attributes are the strongest predictor in terms of explaining customers’ behavioral intentions (Beta=0.494, t=6.440, p<0.05), and H1 was supported; Post-dining service technology attributes are also a strong predictor in terms of explaining customers’ behavioral intentions (Beta=0.272, t=3.236, p <0.05), H3 was supported. There is not a significant relationship between on-site service technology attributes and customers’ behavioral intentions (On-site Service Technology Attributes Beta=0.094, t=1.216, p >0.05), and H2 was not supported.

The regression equation for the customers’ behavioral intentions model can be written as: $\text{Customers’ behavioral intentions} = 0.494*\text{Pre-dining Technology Attributes} + 0.272*\text{Post-Dining Technology Attributes}$

Overall, the regression analysis indicated that hypotheses H1 and H3 were supported, but failed to support, hypothesis H2.
Table 4: Multiple regression analysis

<table>
<thead>
<tr>
<th>Customers’ behavioral intentions (DV)</th>
<th>Beta</th>
<th>t</th>
<th>Sig</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pre-dining Service Technology Attributes</td>
<td>0.494</td>
<td>6.440</td>
<td>0.000</td>
<td>2.500</td>
</tr>
<tr>
<td>2. On-site Service Technology Attributes</td>
<td>0.094</td>
<td>1.216</td>
<td>0.226</td>
<td>2.569</td>
</tr>
<tr>
<td>3. Post-Dining Service Technology Attributes</td>
<td>0.272</td>
<td>3.236</td>
<td>0.001</td>
<td>2.995</td>
</tr>
</tbody>
</table>

Note: R Square = 0.631; Anova F = 89.420, p <0.05
CHAPTER 5:
CONCLUSION

5.1 Discussion

Nine service attributes were included to represent casual dining restaurants’ service technology attributes. They were categorized into three factors. According to the results of multiple regression studies, customers’ behavioral intentions within casual dining restaurants were influenced by both the pre-dining service technology attributes and the post-dining service technology attributes.

Customers look to visit a casual dining restaurant with pre-dining service technology attributes (the availability of online reservations, online menu, and discovering platforms). Customers like the availability of online menus, they believe that making reservations online is more convenient than making reservations by phone, and when they want to make an informed choice about a casual dining restaurant, they like to read online reviews about a restaurant via the internet platforms. It is not surprising that pre-dining service technology attributes significantly influence casual dining restaurant customers’ behavioral intentions since we now live in a world that relies on technology to gather information. The findings suggested casual dining restaurants could consider offering online reservations and online menus to increase customers’ willingness to visit the restaurant. They may also work on discovering platforms for marketing reasons, such as yelp, google, and open table review site. Customers like to read online reviews about a restaurant to make a well-informed decision.

Post-dining service technology attributes were also influential on customers’ behavioral intentions. Casual dining restaurants could consider working on their review
websites, social media for writing reviews, and mobile app/mobile wallet reward program, to achieve a willingness to visit a restaurant, positive WOM, and the likelihood of recommendation intention from their customers.

The result did not find a significant relationship between on-site service technology attributes (the availability of Wi-Fi, self-order system, and NFC payment system) and customers’ behavioral intentions. It conflicts with one study that happened prior-pandemic time: guests nowadays consider “wifi availability, online reservations, and consumer ordering programs” as the most important restaurant technologies which affect their dining experience (Toast report 2019). It may because of casual dinning restaurant is a specific sit-in service restaurant, and human contact is more important for casual dining restaurant customers than fast food restaurant customers. The casual dining restaurant customers expected more human contact and communication feature during their on-site dining time (Leung, Josiam, & Moody, 2020).

5.2 Implication

Casual dining restaurants can benefit from such technology, considering the significant negative impact of COVID-19. The pandemic’s most severe effects were felt by restaurants specializing in sit-in services, forcing them to either close or switch to off-site catering. The fear of infections pushed most customers away from restaurants, who opted to order food deliveries (Kim & Lee, 2020). Previous studies focusing on casual dining restaurants have inconclusive results regarding customers' behavioral intentions toward technology in restaurants. For instance, Nilsson et al. (2021) found that customers in casual dining restaurants expressed moderate attitudes toward self-service technology, such as “automated phone service, self-checkout kiosks, and mobile payment solutions.”
Conversely, Dixon et al. (2009) discovered that customers' perspectives on these technologies differed. In the study, customers that had used the technology before expressed supplementary positive behavioral intentions than first-time users (Dixon et al., 2009). Considering the disruption of operations and the moderate customer intention towards technology, casual dining restaurants can benefit from a better understanding of optimal technology deployment.

This study redefined the importance of technology service attributes in the casual dining restaurant industry by analyzing the technical attributes and providing a new direction for restaurants after the big hit (coronavirus). More casual dining establishments can implement these technologies to help them withstand the threat by being aware of the key industrial characteristics and elements that can influence customers’ behavioral intentions following the crisis. There are existing articles about technologies in the food service industry, but with the situation going on worldwide, people may re-evaluate what’s important for them when they choose a restaurant. Because of the current labor shortage issue, more and more casual dining restaurants have to adopt technology service attributes to take over some employee workloads. The results can help casual dining establishments manage their spending amid the labor crisis and ensure that restaurant owners do not overspend or spend money on trivial items.

5.3 Limitation and Future Research

There are three factors and nine attributes included in this study, and future studies can include more internal and external factors to make the result more significant. This study only focused on casual dining restaurants, and future research can study different types of food service industries.
The covid-19 is an international pandemic that struck catering industries worldwide. The current study only focuses on the customers' perspective within the U.S. Future study can focus on different countries to test the customers’ behavioral intentions toward service technology attributes within the food service sector, and a larger sample size can be tested as well.

The association between the factors and the demographic data was not examined in this study. Future research on the subject could examine whether there are disparities in opinions on the attributes of service technology across genders or ages. The results’ applicability to particular demographic groups can be ascertained by further research.


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Survey Questionnaire

Survey: Service technology attributes within casual dining restaurants

This survey aims to find out the relative importance of service technology attributes in casual dining restaurants. Casual dining restaurants refer to a category of restaurants that offer moderately priced dining services in a relaxed atmosphere. These restaurants fall in between fast-food restaurants and fine dining restaurants. Examples are Chili’s, Olive Garden, TGI Fridays, and Red Lobster.

Since February 2020, the foodservice industry has faced the unprecedented impact associated with the spread of COVID-19 across the world, such as close down and layoffs. With labor shortage issues, some casual dining restaurant businesses are using service technologies to give customers a better dining experience while easing the labor shortage crisis. Some examples of service technology attributes include an online reservation system, information searching platforms (yelp, open table, Google Maps, etc.), Wi-Fi availability for guest entertainment (e.g., surfing the web, playing the game, listening to music, etc.), and social media for customer engagement (e.g., Facebook, Instagram, Twitter, etc.).

In this survey, you are invited to share your attitudes toward service technology attributes within casual dining restaurants. Please go through the questionnaire and complete all questions. Your responses are highly valued and appreciated.
**Screening Questions: Yes-No**

1. Do you give consent to participate in this research study entitles “Customer Attitudes and Behavioral Intention towards Service Technologies Attributes within Casual Dining Restaurants”?

2. Have you visited a casual dining restaurant within the past 12 months?

3. I am 18 years of age or older.

---

Next, please imagine you are planning to choose a casual dining restaurant for a family or friend get-together, and you come across a restaurant that fits your preference. In addition, it provides several service technologies to its customers. Please answer the following questions.

**Please mark the extent to which you agree/disagree with each of the following statements: Strongly disagree (1)/Strongly agree (7)**

**Pre-dining Service Technology Attributes:**

1. Compared with a reservation by phone, an online reservation is more convenient

2. I like the availability of online menus

3. I want to read online reviews about a restaurant on discovering platforms to make a well-informed decision

**On-site Service Technology Attributes:**

1. I prefer restaurants with Wi-Fi hotspots

2. I prefer using the restaurant self-order system if available

3. Using the mobile NFC payment system (Apple Pay) for restaurant payments has become natural to me

**Post-Dining Service Technology Attributes:**
1. I want to let out my feelings about the restaurant through social media
2. I prefer sharing opinions about the restaurant on review websites if available
3. I would be satisfied with using the mobile reward program provided by a restaurant

Please mark the extent to which you agree/disagree with each of the following statements: Strongly disagree (1)/Strongly agree (7)

1. My attitude toward restaurant service technologies, in general, is Good
2. My attitude toward restaurant service technologies, in general, is Positive
3. My attitude toward restaurant service technologies, in general, is Favorable

Please mark the extent to which you agree/disagree with each of the following statements: Strongly disagree (1)/Strongly agree (7)

1. My attitude toward casual dining restaurants offering service technologies is Good
2. My attitude toward casual dining restaurants offering service technologies is Positive
3. My attitude toward casual dining restaurants offering service technologies is Favorable

Please mark the extent to which you agree/disagree with each of the following statements: Strongly disagree (1)/Strongly agree (7)

1. I am willing to visit a casual dining restaurant with service technologies
2. When choosing casual dining restaurants, I prefer the ones that offer service technology
3. The likelihood that I will recommend the casual dining restaurant with
service technologies is high

**Demographics**

1. Gender
   a. Male
   b. Female

2. Age
   a. Fill the blank

3. Educational Level
   a. Less than high school
   b. High School Graduate
   c. Some College
   d. Bachelor’s degree (4-year)
   e. Master’s degree
   f. Doctoral degree or above

4. Ethnicity
   a. Caucasian
   b. African American
   c. Asian
   d. Hispanic
   e. American Indian or Alaska Native
   f. Native Hawaiian or Pacific Islander
   g. Other
   h. Two or more races
5. Annual Household Income
   a. Less than $30,000
   b. $30,000 to $49,999
   c. $50,000 to $69,999
   d. $70,000 to $99,999
   e. More than $100,000

6. Marital Status
   a. Married
   b. Widowed
   c. Divorced
   d. Separated
   e. Never married
### APPENDIX B

Items development table

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Pre-dining Service Technology Attributes</th>
<th>Factor 2 On-site Service Technology Attributes</th>
<th>Factor 3 Post-Dining Service Technology Attributes</th>
<th>Customers’ behavioral Intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compared with a reservation by phone, an online reservation is more convenient</td>
<td>I prefer restaurants with Wi-Fi hotpots</td>
<td>I want to let out my feelings about the restaurant through social media</td>
<td>I am willing to visit a casual dining restaurant with service technologies</td>
</tr>
<tr>
<td></td>
<td>I like the availability of online menu</td>
<td>I prefer using the restaurant self-order system if available</td>
<td>I prefer sharing opinions about the restaurant on review websites if available</td>
<td>When choosing casual dining restaurants, I prefer the ones offer service technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Using the mobile NFC payment system (Apple Pay) for restaurant payments has become natural to me</td>
<td>I would be satisfied with using the mobile reward program provided by a restaurant</td>
<td>The likelihood that I will recommend the casual dining restaurant with service technologies is high</td>
</tr>
</tbody>
</table>