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A Comparison of Self-Service Technologies (SSTs) in the U.S. Restaurant Industry: An Evaluation of Consumer Perceived Value, Satisfaction, and Behavioral Intentions

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A COMPARISON OF SELF-SERVICE TECHNOLOGIES (SSTS) IN THE U.S.
RESTAURANT INDUSTRY: AN EVALUATION OF CONSUMER PERCEIVED VALUE,
SATISFACTION, AND BEHAVIORAL INTENTIONS

by

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ABSTRACT

Innovation in technology has been growing rapidly in recent years. Many restaurants have been utilizing different types of self-service technologies (SSTs) to enhance their operations and customer satisfaction. Despite, the rapid spread of SSTs in the restaurant industry, very limited empirical research has been conducted to evaluate the influence of SSTs type on customer dining experience.

Therefore, the purpose of this dissertation was to examine the SSTs values that influence restaurant customers' satisfaction and their decision to continue to reuse SSTs. More specifically, this study utilized the Theory of Consumption Values (TCV) to examine consumers' perception of the SST values across different types of restaurant proprietary SSTs (kiosk, tabletop, restaurant mobile app, and web-based SSTs).

In order to examine the hypothesized relationships, a quantitative research approach was utilized with the survey research method. An online self-administered questionnaire was developed in Qualtrics for each type of SSTs. The questionnaires were distributed utilizing Amazon mechanical Turk (MTurk). Data was collected in May 2019 from restaurant customers who previously used/experienced one of four SSTs. A total of 619 questionnaires were usable and retained for the data analysis procedures. PLS-SEM and PLS-MGA were utilized to evaluate the conceptual model.

The results revealed that emotional values were the most significant SST values that influence customer satisfaction with the restaurant SST experience and continuance intention. SSTs customization features were positively related to customer satisfaction across all the SSTs included in this study. The theoretical and practical implications of the results were discussed as well as the limitations of the study and future research directions.

To my parents, thank you for your support and prayers, Allah blesses you.

To my lovely wife Maryam, thank you so much for your unconditional sacrifices,

patience, emotional supports, and continuous encouragement that empowered me to achieve my goal.

To my beloved children, you have made me stronger, better and more fulfilled than I could have ever

imagined.

I love you dearly.

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CHAPTER ONE: INTRODUCTION

Chapter Overview

This chapter sets the foundation for the study. It begins with highlighting some of the background literature for the current study. Next, an outline of the research context and theoretical framework is presented. The proposed conceptual model is presented and explained. Finally, study objectives, research questions, and the significance of the study are discussed.

Background

The innovation in technology has grown rapidly in the recent years. The restaurant industry is facing waves of technological challenges which will affect it in the years to come. According to a recent survey carried out by the National Restaurant Association, restaurant customers' expectations from technology are increasing, as they are looking for more control over their dining experience (National Restaurant Association, 2017b). Restaurant operators need to meet their customer expectations by integrating their service with technology in order to maintain their competitive advantage (Bilgihan, Okumus, Nusair, & Kwun, 2011; Bilgihan & Wang, 2016). According to a recent report by the National Restaurant Association, approximately 72% of restaurant customers indicated that technology increases convenience (National Restaurant Association, 2017a). This an indication that technology adoption in the restaurant industry may have an influence on the dining experience.

Self-service technologies (SSTs) have become a very popular invention that many restaurant operators have chosen to adopt to utilize SSTs in their restaurant. It is defined as "a technological interface that allows customers to produce a service independent of direct service employee involvement" (Meuter, Ostrom, Roundtree, & Bitner, 2000, p. 61). According a recent industry survey carried out by American Express Restaurant Trade Survey, 87% of restaurant operators believe that incorporating technology in their restaurants would help attract more customers (American Express, 2016). Restaurant industry professionals are experiencing the tremendous benefits SSTs can provide to their businesses (Chen, Yen, Dunk, & Widjaja, 2015; Huang & Rust, 2017). For example, prior study found that SSTs adaptation in the restaurant industry enriches customer dining experience (Huang & Rust, 2017).

<u>Problem Statement</u>

In the restaurant sector, customer satisfaction can be considered a success or failure factor for the business (Deng, Yeh, & Sung, 2013). Successful restaurant operators are working hard to keep up with their customer expectations, and many are installing SSTs to helps them to increase the satisfaction of service delivery (Oracle Hospitality, 2018).

Many examples from the restaurant industry show that SSTs help their businesses to achieve a higher level of customer satisfaction. Shake Shack restaurant chain recently introduced SST digital menu tablets that allow customer to place their order and minimize their waiting time associated with the order taking process, an innovation which enhanced the ordering experience and positively impacted customer satisfaction (Morris, 2017). As a result of minimizing waiting time, restaurant customers would "spend an additional $20 for food and beverage if wait times were cut in half – representing a 43% increase in typical spend per party" (Yasuda, 2017, p. 3).

Panera 2.0 initiative is another successful example that was recently introduced by the company. It seems to be successful according to their customer feedbacks (Morris, 2017). Panera 2.0 initiative is further explained by Panera media center as a "series of integrated technologies to enhance the guest experience for all consumers no matter how they choose to use Panera. Panera 2.0 brings together new capabilities for digital ordering, payment, operations and, ultimately, consumption to create an enhanced guest experience for "to go" and "eat-in" customers" (Yohannan, 2014, p. 1).

The customers also reap some benefits from the introduction of SSTs in the restaurant industry. Previous studies found that restaurant customers enjoyed using SSTs for a variety of reasons such as convenience and enjoyment (Kim, Christodoulidou, & Choo, 2013). A study conducted in fast casual restaurant settings found that customers appreciate using tabletop menus

because they provide several benefits such as convenience, easy to use, and credit card security (Susskind & Curry, 2016).

However, recognizing the current SSTs popular trends in the restaurant industry, there is a wide gap and there are very limited empirical studies that examine different type of SSTs that allows customers to order, request services, and process payment independently in the restaurant context (Ahn & Seo, 2018; Kim et al., 2013; Kim, Mejia, & Connolly, 2017; Susskind & Curry, 2016). Some studies examined the old generations of digital menu SSTs, which have limited functions and do not allow customers to control their dining experience (Beldona, Buchanan, & Miller, 2014; Dixon, Kimes, & Verma, 2009). Most of the previous studies focused on technology using intentions within the tourism and lodging sectors (Bilgihan & Wang, 2016; Bogicevic, Bujisic, Bilgihan, Yang, & Cobanoglu, 2017; Brochado, Rita, & Margarido, 2016; Kim & Qu, 2014).

Therefore, evaluating the restaurant industry SSTs platforms is going to contribute to the current knowledge and fill the identified gap in the literature. The results from this study are expected to provide valuable practical implications to industry professionals by showing what their customers expect and want by adopting the use of SSTs. Consequently, this would assist restaurateurs in their strategic and financial planning when and if they decide to invest in SSTs and would further aid them in selecting the best SST platforms that generate the highest return on investment. The next section will present the aim and the scope of this dissertation.

Purpose of the Study

To address the identified gap in the literature, this study is going to examine the SST values that influence restaurant customers' satisfaction and their decision to patronize to reuse SST. More specifically, this study examines consumers' perception of the SST values across

different types of restaurant proprietary SSTs. The current study focuses on the SSTs that are fully controlled and managed by the restaurant operators themselves. Thus, this dissertation will include the following four SSTs: kiosk, tabletop tablet, restaurant branded mobile app, and restaurant web-based SSTs.

Scope of the Study

This study will evaluate the effect of using different restaurant proprietary SST platforms (kiosk, tabletop, restaurant mobile app, and web-based SSTs) on restaurant customer satisfaction with using a specific type of SST, and if this relationship will have an influence on the restaurant customer to continue using their preferred SST platform.

The current study excludes third party mobile apps because they are mainly designed for delivery services that charges customers and restaurants for the service. Those mobile apps are not owned, and managed or controlled by restaurants themselves, a factor which could increase the risk of customer dissatisfaction. Several industry reports indicated that customers prefer to order food through restaurants directly and not through third party mobile apps (Kelso, 2018). Furthermore, the focus of this dissertation is on SSTs that enable customers to order and customize their meal, and not on service delivery since it represents only 3% of all restaurant orders (Gazer, 2018).

Justification of the Study

Previous research has shown that consumers' attitudes toward using self-service technology is heavily dependent on the type of SST (Curran & Meuter, 2005). It is fair to assume that different SST types can emerge from different attributes or values, and eventually can provide different experiences (Dabholkar, Bobbitt, & Lee, 2003; Zhu, Nakatabl, Sivakumar, &

Grewal, 2013). Furthermore, different types of SSTs can also deliver different service outcomes such as satisfaction/dissatisfaction and continuance to use or stop using certain SSTs (Curran & Meuter, 2005).

Additionally, previous literature has emphasized the importance of differentiation between the broad categories of SSTs because each SST has different functions or features that deliver different experience to the end user (Beatson, Coote, & Rudd, 2006; Dabholkar et al., 2003). For example, Wang, So, and Sparks (2017) examined the influence of two types of SSTs in the airlines industry on customer perception and technology readiness. Robertson, McDonald, Leckie, and McQuilken (2016) examined the antecedents and consequences of customer satisfaction across two types of SSTs in the context of the sports industry. Collier, Sherrell, Babakus, and Horky (2014), examined the differences between public and private SSTs and their influence on customer behavioral intention within the context of the entertainment industry. Curran and Meuter (2005) investigated three types of SST in the banking industry and customer attitude towards adapting bank technologies.

Despite the huge use of SSTs in many industries, there is limited information on how using different types of SSTs can influence the customer service experience (Robertson et al., 2016). In the hospitality industry, only one study mentioned different types of SSTs in the hotel sector (Wei, Torres, & Hua, 2017). To the best knowledge of the author, little empirical research has been conducted to examine customer evaluations of SST options in the restaurant setting.

Theoretical Background

This section introduces the theory of consumption values and its relation to the current study. The theory of consumption values (TCV) consist of five dimensions: functional value, conditional value, social value, emotional value, and epistemic value (see Figure 1). The TCV

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main argument is around that all of the five values have an influence in consumers' behavior regarding buying/using or not buying/using a specific product or service (Sheth, Newman, & Gross, 1991a, 1991b).
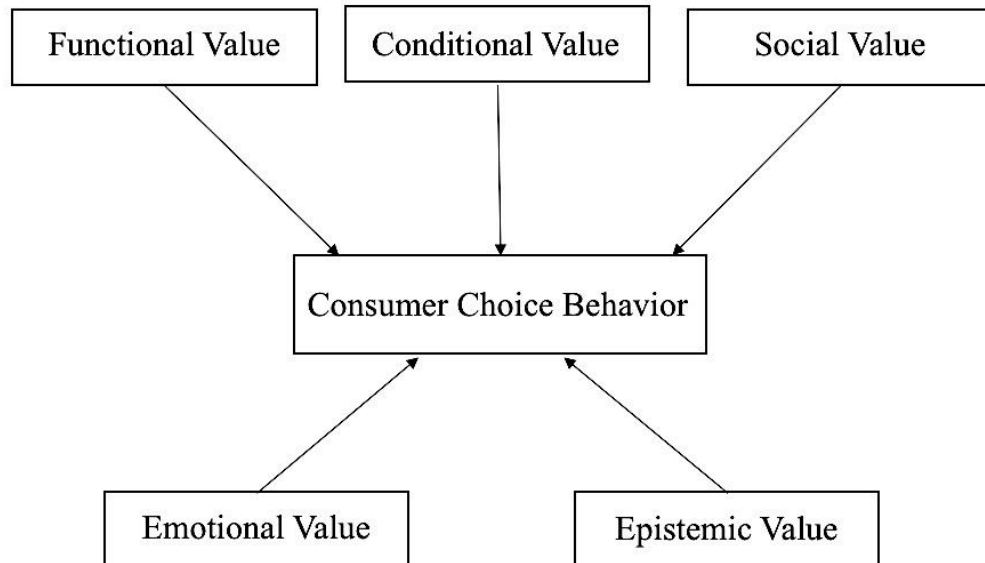
Figure 1: The Five Values Influencing Market Choice Behavior
Source: Adapted from Sheth et al. (1991a, p. 7).

TCV also explains why consumers choose one product type over another and why consumers choose one brand over another (Sheth et al., 1991a, 1991b). The author believes this theory is applicable to choices involving a full range of product or service types. TCV in this study will also determine which type of SSTs restaurant consumers would prefer to use the most. The next section discusses the TCV values in detail as they relate to the current study.

The TCV theory explains consumer's market choice from alternatives. During the literature examination, TCV seems to be the most suitable for the current study because of the following reasons. First, it will help the researcher to understand the consumers' choice of a particular SST type over another. The adoption of the TCV in this study will further help to understand what is driving users' decisions on which type of SST to choose. The TCV

dimensions are believed to enhances the industry professionals to better understand consumers'

wants and needs and to design an effective SSTs platform. This also benefits restaurant operators

by giving them a better understanding of their customer motives to use a specific type of SST

over others; therefore, they can strategically allocate the required resources to invest in the most

useable, profitable SSTs that will eventually deliver an exceptional dining experience to their

customer. Another benefit that TCV has is the ability to explain the salient motives behind using

a particular type of SST.

Conceptual Model
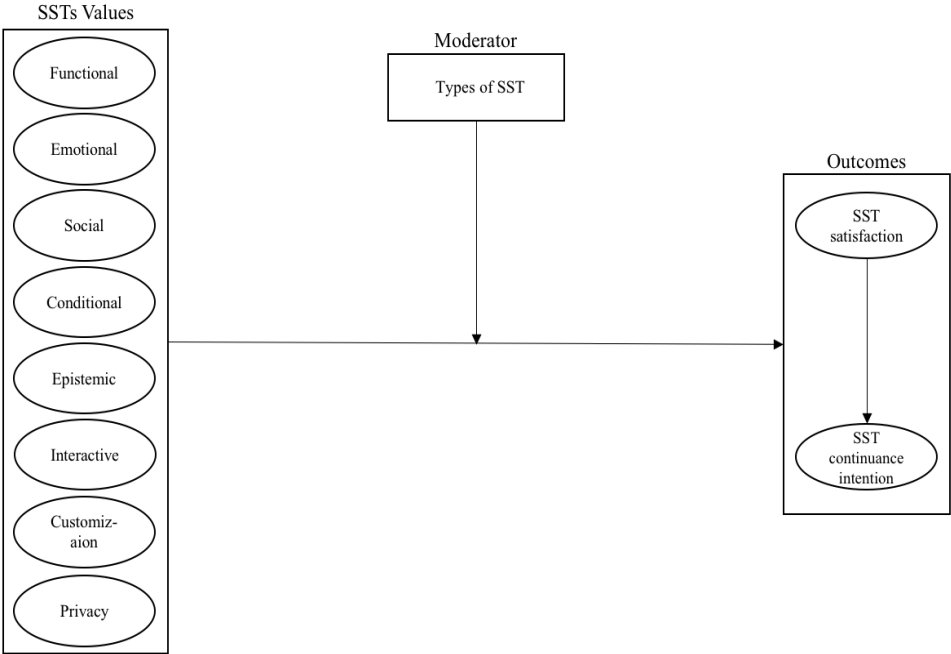
Figure 2: Conceptual Model

Study Objectives and Research Question

A review of the current literature in the context of self-service technologies shows that it

is critical to understand the impact of the SST values on customer satisfaction and continuance

intention within the context of the restaurant industry. Therefore, the objectives of this

dissertation are first, to examine the influence of SSTs values of customer satisfaction with SSTs use. Second, to examine the impact of customer satisfaction with SSTs experience on the continuance intentions. Third, to evaluate customer's perceptions about the four types of SST (kiosk, tabletop, mobile app, and website). Fourth, compare the influence of multiple types of restaurant SSTs (kiosk, tabletop, restaurant mobile app, and web-based SSTs) and their impact on customer satisfaction and continuance SST use intention.

The primary research questions that guide this dissertation are as follows: first, which of the SST values have the most impact on customers' satisfaction with SSTs? Second, which of the four types of SSTs is preferred by restaurant customers? To answer these questions, the relationship between SST values and customer satisfaction with the use of an SST will be examined. This will include an examination of the five value dimensions of the TCV and their influence on customer satisfaction. Next, the influence of customer satisfaction with an SST on their continuance use intention will be explored to determine which SST values have the most influence. Finally, the influence of each type of SST included in this dissertation on customer satisfaction and continuance use intention will be examined.

Significance of the Study

The importance of this study is twofold. The results of this study are expected to contribute both theoretically and practically to the hospitality industry, and in particular, to the restaurant industry. The following section will discuss the theoretical and the practical implications in detail:

Theoretical Significance

This study will investigate the influences of SST values on customer satisfaction and continued use intention utilizing the TCV five values dimensions and applying this theory in the restaurant industry context. First, TCV has multiple dimensions, which will provide a holistic view of the customer motives to adapt a specific SST over another. By examining multiple types of SSTs using TCV dimensions, this study is expected to empirically contribute to the consumer behavior and marketing literature since it will reveal why restaurant customer use or not use certain types of SSTs. Furthermore, the use of TCV in this study is expected to test this theory and confirm its applicability to the current study settings. The inclusion of four types of SSTs as a moderation effect on the hypothesized relationship in this study will strengthen the current knowledge related to technology evolution and adaption from the consumer perspectives. Finally, the comparison of the restaurant SST platforms is expected to contribute greatly to the existing literature in the hospitality industry.

Practical Significance

In addition to the theoretical significance, the results of this study are expected to provide several benefits to the restaurateurs. First, the comparison of the current SSTs implemented by restaurant operators will provide a comprehensive performance evaluation of those SSTs. By providing such an evaluation, restaurant companies will have better information on which SSTs perform better or which SST needs improvement. The results are also expected to help restaurants to better understand their customer expectation and need for SSTs. Finally, restaurant companies who are planning to invest in SSTs might gain useful benefits from the results of this study since they are expected to stand as a guide to SST implementation in the restaurant industry.

Chapter Summary

This chapter provides a background overview and justifications for pursuing this study. Based on the literature review, five research questions were proposed. In addition, the study conceptual framework was presented. Finally, the chapter ends with a discussion of the significance of the study and the expected contributions it makes to the restaurant industry. The rest of the proposal is organized as follows: the next chapter will provide a comprehensive review of the relevant literatures and a review of the study construct and conceptual framework. Following chapter (2), chapter (3) will provide a full description of the research method, measurement items, survey development, data collection, analytical strategy, and expected results for the study.

CHAPTER TWO: LITERATURE REVIEW

Chapter Overview

The purpose of this chapter is to provide a clear discussion of the study context and to present the theoretical background which guides the current study. The first part of the chapter discusses and evaluates the development and the adoption of the self-service technologies (SSTs) in general and in the restaurant industry specifically. Next, the impact of SST adoption in the restaurant industry is discussed. The next section of the chapter discusses previous theories that have been utilized in SST studies. Next, the study's theoretical background is explored, and related theories and previous empirical research in the restaurant context are examined. Next, the theory of consumption values (TCV) is examined, and justifications of utilizing this theory to examine the impact of its value dimensions on customer satisfaction is developed. Finally, the chapter concludes with the presentation of the proposed conceptual model followed by a summary of the chapter.

Self-Service Technologies Definitions and Classifications

The literature shows a wide controversy among scholars about defining the concept of SSTs. One of the most widely adopted definition of SST defines it as "a technological interface that allows customers to produce a service independent of direct service employee involvement" (Meuter et al., 2000, p. 61).

The classification of SST in the literature has included extensive discussion including agreement and disagreement. One of the earliest classifications of SSTs was developed by Dabholkar (1994), who classified SSTs into two main categories. Dabholkar (1996) proposed that SSTs can be classified based on the location "onsite or offsite" based on where customers access/use SSTs, "service site", and "customer's home or place of work". The "on-site" options can be described as touch screens in department stores, information kiosks at hotels, and self-scanning devices in grocery stores and libraries, and the "off-site" option includes telephone and online banking and shopping on the internet (Dabholkar, 1996).

Another similar approach was taken to provide a clear definition for SSTs by Collier et al. (2014), who classified SSTs into public and private categories. They defined public SST as "an SST located where social interaction can take place between the customer and other patrons during the self-service experience" (p. 61). For example, public SSTs can include kiosks, ATMs, and gas stations paying at the pump option. They described private self-service technologies as those SSTs located where a customer can interact with a SSTs without interaction with others (Collier et al., 2014). For examples, private SSTs include the Internet, in-room hotel check-out, and interactive phone systems utilized in the hotel industry (Collier et al., 2014). Other researchers feel that SSTs should be categorized based on the level of interaction with the technology. For instance, Verhoef et al. (2009) classified SSTs based on the degree of interaction

with the technology as "passive" SSTs that provide information to the customers without technology interaction, or "active" SSTs that require customer participation in the service delivery.

The Evolution of Self-Service Technologies

The emergence of self-service technology research began in the 1980's when Bateson (1985) examined consumers' choice behavior when encountered with the choice between a self-service option and a traditional human interaction service delivery. This was one of the first attempts to examine the impact of SSTs on consumer choice in the retail industry.

Banking and retail industries were among the first movers to adopt SSTs to enhance their consumers' experiences. For example, automated teller machines (ATM), pay at gas pumps, automated phone services, and vending machines were the first generation of SSTs developed for consumer use (Fisher & Beatson, 2002; Meuter et al., 2000). A detailed classification of the evolution of SSTs was developed by Fitzsimmons (2003), which shows the development stages of self-service and how service delivery slightly switched from human interaction to substitution of technologies for service employees, and to the recent trends of SSTs (see Table 1 for more details).

Table 1: The Development of Self-Service Technologies Across Different Industries

Industry	Human contact	Machine assisted service	Electronic service
Retail banking	Teller	ATM	Online banking
Grocery	Checkout clerk	Self-checkout station	Online order/pickup
Airlines	Ticket agent	Check-in kiosk	Print boarding pass
Restaurants	Wait person	Vending machine	Online order/delivery
Movie theater	Ticket sale	Kiosk ticketing	Pay-for-view
Book store	Information clerk	Stock-availability terminal	Online ordering
Education	Teacher	Computer tutorial	Distance learning
Gambling	Poker dealer	Computer poker	Online poker
Retail store	Checkout clerk	Self-checkout station	Online shopping

Source: Adapted from Fitzsimmons (2003, p. 444).

The Development of Self-Service Technologies in the Restaurant Industry

In the restaurant industry, fast food restaurants were among the first adopters of SSTs. McDonald's first introduced the self-ordering kiosk, which allowed customers to build and customize their burger in the 90s (Bloomberg News, 1999); however, at that time, this innovation was not successful and created several operational issues which forced the company to remove this innovation. Then the company redesigned their kiosk technology and introduced it again in 2015 (Garcia, 2018).

Since then, academic research has tried to examine the development and the adoption of SSTs in the restaurant industry (Dabholkar, 1996; Dabholkar & Bagozzi, 2002). After MacDonald's SST introduction, the application of SSTs in the hospitality industry and specifically in the restaurant industry has been wide spread. The use of e-tablet menus was firstly implemented in the pan-Asian restaurants in London and Rotterdam (Pieska et al., 2013). At this time, , tabletop tablet menus could be seen in many restaurants around the globe such as Chili's, Applebee's, TGI Friday's, Shake Shack, Panera, Olive Garden, among many others (Morris, 2017; Restaurant Technologies Inc, 2017; Yasuda, 2017).

More recently, the preside of IHOP restaurant announced new digital updates which include "handheld tablets for servers, a wireless EMV device at tables for payment, and an integration with Yelp's No Wait app, which uses an algorithm to predict waiting times and texts customers with updates" (Dawson, 2018, p. 6). Another recent evolution of SSTs was the appearance of mobile app menus, a feature which has also been widely adopted in the industry. For example, restaurants like Chipotle, Chick-Fil-A, Subway, and Domino's Pizza have adopted mobile app menus to engage their customer in the process of food ordering and, as a result, have increased their sales (Jung, Kim, & Farrish, 2014; Kimes & Laque, 2011).

The Current Stages of Self-Service Technologies in the Restaurant Industry

Companies in the hospitality industry work hard to allocate the required resources for their business success and customer satisfaction. Investment in technology is one of the most critical success factors in today's business world. For this investment to be successful, it should meet consumers' needs and expectations so that consumers may positively evaluate their SST experience and continue reusing the service again. This positive experience with SST usage could generate positive word of mouth and enhance customer loyalty. Companies can utilize technology as a source of competitive advantage.

The application of SST's in the hospitality industry has been widespread. All sectors operating within the hospitality industry have adopted certain types of SSTs. For instance, in the restaurant industry, digital menus can be seen in Chili's, Applebee's, TGI Friday's, Shake Shack, and Panera (Morris, 2017; Yasuda, 2017). The current interactive digital menus utilized by casual dining restaurants are limited with their functions since they allow guests only to read menus and learn about nutritional information and ingredients, play games, pay their bills, page servers, and complete satisfaction surveys (Beldona et al., 2014). For example, placing a menu order placement or requesting services has not been yet widely adopted due to the higher cost associated with this kind of technology (Kuo, Chen, & Tseng, 2017). A recent industry report indicates that an interactive digital menu which allows customers to order and customize their meal is considered to be one of the important future technological innovation trends in the restaurant industry (National Restaurant Association, 2016).

<u>The Impact of Self-Service Technologies on Restaurant Menus</u>

The innovation in technology has been growing rapidly in recent years which, in turn, has impacted restaurant operational activity. According to a recent survey carried out by the National Restaurant Association, restaurant customers expectation are increasing as they are looking for more control over their dining experience (National Restaurant Association, 2017b; Wang & Wu, 2014) .To meet this expectation, restaurant operators are integrating their services with SSTs to maintain their competitive advantage (Bilgihan et al., 2011; Bilgihan & Wang, 2016). A recent industry report, shows that more than 70 percent of restaurant customers reported that the use of technology in restaurants increases their convenience (National Restaurant Association, 2017b). This is an indication that technology adoption in the restaurant industry may have an influence on the overall dining experience.

A restaurant menu has been defined as a guiding map that provides customers with an easy navigation between hunger and satisfaction (Cichy & Wise, 1999). Previous research on restaurant menus indicated that the menu is one of the most important tangible elements in the restaurant (Beldona et al., 2014). Many studies highlighted the importance of restaurant menus and how it is it is important for restaurant operators to use their menu to enhance customer experience (Beldona et al., 2014). For example, Baiomy, Jones, and Goode (2017) found a significant relationship between the three menu attributes (menu item descriptions; menu variety, menu design), and restaurant customer satisfaction. Positive impact was mentioned from the industry perspective of the restaurant menu in terms of color, layout, and graphic design (Kershaw, 2009).

Customer expectations from restaurant menus were examined by Mills and Thomas (2008), and they found that the attributes of nutrition information, product information, and food

preparation methods were top attributes customers expected to see in the menu. Wolf and Zhang (2016) found that by providing customers with a menu that allows them to customize their order (such as build your own, pick two) enhances their dining experience. Kelson (1994), provided a top ten list of successful menu attributes that restaurant managers should review when designing their restaurant menus, features which include items such as speak plainly, say what's important, describe it completely, remember less is more, but don't be afraid to be descriptive.

<u>**Restaurant Motives to Adopt Self-Service Technologies**</u>

According an industry report carried out by American Express (2016) Restaurant Trade Survey, revealed that 87% of restaurant operators believe that incorporating technology in their restaurants would help attract more customers (American Express, 2016). Restaurant industry professionals are experiencing tremendous benefits that SSTs can provide to their businesses (Chen et al., 2015; Huang & Rust, 2017). For example, prior studies showed that the implementation of SSTs can help businesses in many ways by reducing operational costs (Dabholkar 1996; Hua, 2016; Walker & Johnson, 2006), being more efficient (Dabholkar 1996; Wang & Wu, 2014), increasing revenues (Chen et al., 2015), and meeting customer expectations (Dabholkar 1996; Huang & Rust, 2017). A recent study for instance found that when guests use the tabletop technology to place and/or customize their order, and pay their checks, it reduces the contact time between the server and the customer which, in turn, increases server productivity (Susskind & Curry, 2018).

In addition, customer satisfaction is considered as one of the main success or failure factors in the restaurant sector (Deng et al., 2013). Successful restaurant operators are working hard to keep up with their customers' expectations and are implementing SSTs to help them increase their satisfaction with service delivery. Many examples from the restaurant industry

have indicated that SST helps businesses to achieve a higher level of customer satisfaction. Shake Shack restaurant chain recently introduced SST digital menus to cut the long line during the order taking process, which has enhanced the ordering experience and positively impacted the level of customer satisfaction (Morris, 2017). Another example is Panera's 2.0 initiative recently introduced by Panera bakery. This new technology seems to be successful according to their customer feedback (Morris, 2017). Chipotle Mexican Grill restaurant chain offers a mobile app for their customers to be able to place orders ahead of time with a dedicated pickup line, which then increases service speed and attracts more customers, especially those who prefer less waiting time (Collier & Kimes, 2013). SST utilization brings many benefits to the restaurant businesses which explains the large diffusion of such technologies in the industry; however; restaurant owners and operators should also consider the importance of their customers' needs and expectations from these types of technology. According to the National Restaurant Association, the next five years will reshape the industry in terms of technology adoption. The report shows that by 2021, consumers will demand more engagement and control of their dining, by providing technology that allow them to place their order directly (National Restaurant Association, 2016).

Types of Self-Service Technologies in the Restaurant Industry

This section provides an overview of the SSTs adopted in the restaurant industry. The most commonly adopted SSTs include kiosks, tabletop menus, and mobile apps. Recent empirical findings suggest that 61.6 percent of the SSTs in restaurant sectors were kiosk/touch screen menus for ordering food, and 37.5 percent were smart phone/tablet applications (Wei et al., 2017). The current study focuses on those most common SSTs adopted in the restaurant

businesses (kiosks, tabletop menus, restaurant mobile apps, and web-based SST). More details about each SST included in this study are presented in the following section.

Kiosk Self-Service Systems

The Kiosk self-service system, a type of SST, is spreading widely in the fast food restaurant sector. For example, cashier orders at McDonald's were replaced by 7,000 kiosks across Europe (Collado, 2011). Despite this popularity, the literature could not provide a clear definition for the restaurant kiosk system. A generic definition which originated from the computer science field by Tung and Tan (1998) states that "an information kiosk has been defined as a computer-based information access point with features designed to make it suitable for the general public" (p. 255).

The kiosk is one type of SST that has not being defined properly in the previous studies in the hospitality or tourism industry. A single and unique definition was found in an academic paper published in the *Journal of Hospitality and Tourism*, which states that "a kiosk generally refers to a self-service machine which allows customers to order food and other services without encountering an employee, and it is one of the most common and popular type of SSTs utilized in the restaurant industry, including self-order kiosks with touch screen, tabletop ordering devices, and drive-thru kiosks" (Kim et al, 2013, p. 41). The North American self-service kiosk survey defines kiosk as a self-standing, technology-based, unmanned device (Kasavana, 2008).

Another researcher provided three characteristics to define a kiosk, mentioning that is a self-service technology station with interactive information, a processing capacity, and is located in a public area (Rowley & Slack, 2007). Other scholars defined kiosks as a sort of "order-entry system" and further identified them as " a kiosk setup allows customers to place orders on touchscreen terminals" (Ansel & Dyer, 1999, p. 76). From the information technology

perspective, kiosk is defined as "an electronic device or a computer terminal placed near common public areas", "Kiosks are usually self-service stations where the common public gets the relevant information without any human assistance" (Kaur & Malhotra, 2018, p. 269). Based on these definitions and the current trend in the restaurant industry, this study defines a restaurant kiosk as a standing interactive menu machine located inside the restaurant which allows customer to place, customize, and pay for their meal order without the need to interact with service employees.

Tabletop Menu

Tabletop menu, tableside electronic monitors, digital menu, eMenu, iMenu, iPad menu, MenuPad, e-table, e-tablet menu, and a handheld of other ordering devices were all referred to tabletop menus. A recent study (Ahn & Seo, 2018) tried to compose those terms into a more holistic term called interactive restaurant self-service technologies (IRSST). Despite the current popularity of this type of SST, still there is disagreement among scholars on how it should be defined or even named. Tabletop menus is the term that is now more commonly used; however, very few restaurants have implemented the system since it is still in its early development stage (Wang & Wu, 2014). Brewer and Druin (2010) called it "iMenu" and defined it as an interactive menu for restaurants that increases customer control over the food ordering process by allowing the customer to choose, and customize a meal which, in turn, increases satisfaction level.

Pieska et al. (2013) define e-table and eMenu systems as an interactive menu for restaurants which could receive and deliver customer orders to the kitchen without the need to call or wait for the server. A more detailed definition begins with a classification of the propose of this type of technology in the restaurant industry by stating that the "Menu Pad introduces several possibilities that have the potential to make dining easier and more convenient" (Wang &

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Wu, 2014, p. 404). They defined Menu Pad as a touch screen device with strong ease-of-use display that features an interactive menu that allows customers to view all menu items digitally and then directly send their order to the kitchen.

Mobile Applications Apps

Mobile apps or mobile applications are the third type of SST included in this study. DiPietro (2017) claims that the "use of mobile apps is on the rise in restaurants today and it is anticipated that this will become a more developed research topic in the future" (p. 1211). However, until recently, most of the current literature that includes a definition for mobile apps comes from the field of computer science research. According to Haught, Wei, and Karlis (2016), mobile applications, or "apps", is a "stand-alone, task-oriented software used on mobile devices, including smartphones, tablet computers, electronic readers, and digital music players with an Internet connection" (p. 1). This definition does not include what mobile apps can do. In a recent study, Newman, Wachter, and White (2018), defined an app as a "mobile application on a smartphone/tablet that is used for purchase or completion of some transaction that may result in an actual purchase transaction" (p. 220). Other scholars tried to define the term mobile app from the consumer experience angle by stating that "smartphone apps are defined as software that is downloadable to a mobile device, which prominently displays a brand identity, often via the name of the app and the appearance of a brand logo or icon, throughout the customer experience" (Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011, p. 392).

Others chose to define mobile apps based of the application features and functionality. For instance, Kang (2014) defines mobile apps as "a program specifically designed to perform certain functions on mobile computing devices" (p. 20). An in-depth search for some definitions for mobile apps in restaurants or other related industries such hospitality or tourism revealed very

limited number definitions. Rita, Oliveira, Estorninho, and Moro (2018) defined mobile hotel

app servcie as "a location-based online service, achieved through a mobile device connected to

wireless Internet and Global Navigation Satellite System, and used as a tool to access, request,

and purchase services related to hotels" (p. 144). In this study, restaurant mobile app is defined

as a smartphone application owned and operated by the actual restaurant company that allows the

consumer to look at the restaurant menu, access nutrition information, order from the app dine-in

& out with fully customization functions, pay through the app, and manage any memberships

rewards.

Finally, mobile apps are considered to be one of the most popular and recent inventions

in the type of SST that has been utilized in the restaurant industry. Today, it could be true that

every major restaurant chain has a mobile app to meet their consumer expectations (Apple, 2019;

Kapoor & Vij, 2018). In a research of major apps providers for smartphone users, Apple revealed

a complete list of all food and drink related apps (Apple, 2019). The author of this study

reviewed the list and removed all apps that were designed for food delivery, information apps,

recipes, third party apps, restaurant booking apps, and any of apps that are not for restaurant

menu ordering. A full list (as of April 2, 2019) of those restaurants that have mobile apps that

allow consumers to order food directly from the apps is presented in Table 2 (Apple, 2019). As

illustrated in Table 2, the focus of this study is on the restaurant branded mobile apps which

exclude other third-party apps through which consumers can order foods and request delivery

services.

Table 2: List of Restaurants Provide Mobile Apps

	Restaurant Apps name	Order from the apps (yes/no)
1	Applebee's	yes
2	Arby's	yes
3	Auntie Anne's Pretzel Perks	no, menu browsing only
4	Baskin-Robbins	no, menu browsing & payment only
5	BJ's Mobile	yes, location restriction
6	Blaze Pizza	no, menu browsing only
7	Buffalo Wild Wings, Inc. B-Dubs®	yes
8	Buffalo Wild Wings, Inc. Blazin' Rewards	no, same restaurant - for rewards only
9	Burger King	yes, location restriction
10	Cafe Rio	yes
11	Caribou Coffee	yes
12	Carrabba's Italian Grill	no, payments & rewards
13	CAVA Mezze Grill	yes
14	Chick-Fil-A	yes
15	Chicken Salad Chick	yes
16	Chili's	yes
17	Chipotle	yes
18	CHOP'T Creative Salad Co.	ye
19	Church's Chicken	no, menu browsing & rewards
20	Costa Vida Fresh Mexican Grill	yes, location restriction
21	CPK Rewards California Pizza Kitchen	yes, for takeout ordering
22	Cracker Barrel	yes
23	Culver's	no, menu browsing & rewards
24	Dairy Queen	yes, location restriction
25	Del Taco	no
26	Denny's	yes
27	Domino's Pizza USA	yes
28	Donatos Pizza	yes
29	Dunkin' Donuts	yes
30	Einstein Bros Bagels	no, menu browsing & payment only
31	El Pollo Loco - Loco Rewards	yes
32	Farmer Boys	no
33	Firehouse Subs	yes
34	First Watch	no, menu browsing & reservations only
35	Five Guys Burgers & Fries	yes
36	IHOP	yes
37	In-N-Out	no, restaurant location finder only!!
38	Insomnia Cookies	yes

(continued)

	Restaurant Apps name	Order from the apps (yes/no)
39	Freebirds World Burrito	yes
40	IHOP	yes
41	In-N-Out	no, restaurant location finder only!!
42	Insomnia Cookies	yes
43	Jack in the Box	yes
44	Jamba Juice	yes, location restriction
45	Jersey Mike's Subs	yes
46	Jimmy John's Sandwiches	yes
47	Krispy Kreme Doughnut	no, menu browsing, rewards & payment only
48	la Madeleine French Bakery & Café	yes
49	Little Caesars Pizza	yes
50	McDonald's	yes
51	Moe's Southwest Grill	yes
52	MOOYAH Burgers-Fries-Shakes	no, menu browsing & rewards
53	Red Lobster	yes, for takeout ordering
54	MyCicis	no, menu browsing & rewards
55	Nekter Juice Bar	yes
56	Noodles-World Kitchen	yes
57	Olive Garden Italian Kitchen	yes, for takeout ordering
58	Outback Steakhouse	no, menu browsing, rewards & payment only
59	Panda Express	yes
60	Panera Bread	yes
61	Papa John's Pizza	yes
62	Peet's Coffee	yes, location restriction
63	Pei Wei Asian Diner	yes
64	Penn Station Subs	yes
65	Pizza Hut	yes
66	Popeyes	no, menu browsing only
67	Portillo's Hot Dogs	yes
68	Potbelly Sandwich Shop	yes
69	QDOBA Mexican Eats	yes
70	Ruby Tuesday	menu browsing only
71	Schlotzsky's	no, menu browsing & rewards
72	Shake Shack	yes
73	Sheetz	yes
74	Smashburger	no
75	Smoothie King Healthy Rewards	menu browsing only
76	SONIC Drive-In	yes

(continued)

	Restaurant Apps name	Order from the apps (yes/no)
77	Starbucks	yes
78	Steak 'n Shake	yes
79	SUBWAY	yes
80	Sweetgreen	yes
81	Taco John's	menu browsing only
82	Tropical Smoothie Café	yes, location restriction
83	Wawa	yes
84	Wendy's	yes
85	Whataburger	yes
86	Which Wich Superior Sandwiches	yes
87	White Castle	yes, for takeout ordering
88	Wingstop	yes
89	Yogurtland	menu browsing only
90	Zaxby's	yes
91	Zoës Kitchen	yes

Notes: - This table was developed by the researcher, and all information adopted from the iTunes apps store at Apple.com (Apple, 2019).

Web-Based SST

The fourth types of SST included in this study is the web-based self-service platform that can provide restaurant customers with an SST quality experience. In this study, web-based self-service is defined as a technology channel allow customers to buy or request services online. No proper definition for the web-based self-service was found in the literature. However, Zeithaml, Parasuraman, and Malhotra (2002) defined the service quality of web site as "the extent to which a web site facilitates efficient and effective shopping, purchasing, and delivery of products and services" (p. 363). Based on this information, the web-based SST platform can be a channel that restaurant customers utilize for meal ordering and service customization. Previous studies predicted that online restaurant ordering will be growing, and traditional web sites are still considered to be an important technology-based service and information source for restaurant customers. Most of the previous research examined consumer perception of a web-based SST in

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the hotel industry (Ali, 2016; Bilgihan & Bujisic, 2015). There were limited empirical studies investigated that used a web-based SST in the restaurant context (Gregory, Wang, & DiPietro, 2010).

The inclusion of the web-based SST in this study is expected to enhance and strengthen the findings since the web-based SST has been adapted by some restaurant customers. This will provide a holistic view of the major SST implemented in the restaurant industry (kiosk, tabletop, mobile apps, and web base SST).

Previous Studies Compared Multiple Types of SSTs

An in-depth literature review on the previous studies which examined the type of SSTs in different industries showed that there is a limited number. For example, in the hospitality industry, only a single study clearly mentioned and examined different types of SST in the hotel sector (Wei et al., 2017). Other studies were conducted in a variety of related contexts. In the airline industry, Wang, So, and Sparks (2017) examined the influence of technology readiness dimensions on customer perception of airline SST features and explores whether technology readiness influence varies across different types of SSTs utilized by the airlines industry. In a different context, and specifically in the sports industry, Robertson et al. (2016) examined the antecedents and consequences of customer satisfaction across two types of SSTs (Online services & interactive voice services). Collier et al. (2014) looked at the differences between public and private SSTs and how these differences influence customers' attitudes within the context of the entertainment industry. Finally, Curran and Meuter (2005) examined multiple types of SSTs in the banking industry and how they contribute to consumer acceptance of those technologies. Table 3 provides more details on the previous studies that compare multiple types of SSTs across different industries.

Table 3: Previous Empirical Studies Compare Multiple Types of SSTs

Authors	Aim of the study	Theory	Context & Type of SSTs	Methodology	Variables
Curran and Meuter (2005)	To assess some of the critical variables that contribute to consumer acceptance of SSTs.	Technology Acceptance Model (Davis, 1989).	Banking industry ATM Phone banking Online banking	Design Three different survey Convenience sample Analysis method Factor analysis SEM	DV Attitude towards SST Intention to use SST IV Ease of use. Usefulness. Need for interaction. Risk.
Collier et al. (2014)	To explore the differences between public & private SSTs and how these differences influence customer's attitudes.	Theory of Planned Behavior (Ajzen, 1991).	Entertainment industry Private SSTs (of-site) Public SSTs (on-site)	Design Survey Random sample Analysis method CFA SEM	DV Attitude towards SST Intention to use SST IV Ease of use. Speed of transaction. Perceived control. Utilitarian value. Hedonic value. Technical anxiety.

(continued)

Authors	Aim of the study	Theory	Context & Type of SSTs	Methodology	Variables
Robertson et al. (2016)	To examine the antecedents and consequences of customer satisfaction across two types of SSTs.	Theory of Social Exchange (Lawler, 2001).	Sport industry Online SSTs IVR SSTs	Design Online survey AFL members email list sample Analysis method CFA CMV SEM	DV Positive word-of-mouth Reuse intentions Trust in the provider ME/V Satisfaction IV Reliability. Ease of use. Enjoyment. Perceived control. Speed.
Wei et al. (2017)	To examine the extrinsic and intrinsic attributes of SSTs play role in consumers' satisfaction with SSTs.	Theory of Consumption Values (Sheth et al., 1991a). The Experiential Value Scale (Mathwick, Malhotra, & Rigdon, 2001).	Hotel industry Kiosk In-room TV check-out Internet Apps Restaurant industry Kiosk On-table touch screen Apps	Design Online survey Analysis method CFA Path analysis	DV Satisfaction with SSTs transcendent service experiences IV's Extrinsic attributes Intrinsic attributes

Authors	Aim of the study	Theory	Context & Type of SSTs	Methodology	Variables
Wang, So, and Sparks (2017)	To examine the influence of technology readiness (TR) dimensions on customer perceived important of airline technology-enabled services (TES) features and explores whether TR's influence varies across different types of TESs and airlines.	Technology Readiness Index (Parasuraman, 2000).	Airlines industry Network technologies (Wi-Fi). Established technologies (web-check-in). New & peripheral (Mobile smartphone check-in).	Design Online survey Quota sampling Analysis method EFA SEM	DV Perceived important of TES MO Types of airline IV Optimism. Innovativeness. Discomfort.

Types of Restaurant Utilized SSTs

Restaurant types, classification, or categories can play an important role in utilizing SSTs. This section will provide an overview of the type of restaurant which decided to integrate their dining experience with technology and engage customers in the food ordering service. According to (Canziani, Almanza, Frash, McKeig, & Sullivan-Reid, 2016, p. 1471), the National Restaurant Association "has reported five major restaurant industry segments: quick service restaurants (QSR or fast food), fast casual, midscale, moderate (or casual), and fine dining (or upscale), and it also distinguishes among independent and multi-unit [chain] restaurants" (Canziani et al., 2016, p. 1471). A recent empirical study provides an in-depth analysis to classify restaurant segments for research purposes and classifies restaurants into six segments (Canziani et al., 2016). Their description was based on the most widely source utilized in classifying restaurant segments, which was developed by the National Restaurant Association classification; however; they used different criterial for this segmentation, which is presented in Table 4 (Canziani et al., 2016).

Table 4: Restaurant Types and Classifications

Segment	Description	Examples	Sources
Quick service restaurants (QSR)	ACPP: $4 to $6. "Units prepare economical foods, in quantity, by a standardized method that can be dispensed quickly for consumption on the premises or for takeout" (p. 1479).	McDonalds Chick-Fil-A	Canziani et al. (2016)
Fast casual	ACPP: $8 to $12. "Food is prepared to order with fresh (or perceived as fresh) ingredients; units serve innovative food suited to more sophisticated tastes, in an upscale interior design" (p. 1479).	Panera Bread	Canziani et al. (2016)
Midscale	ACPP: $15 - $24.99. "This category focuses on casual dining with mainstream dishes and units often feature a bar area and serve alcoholic beverages" (p. 1478).	Applebee's TGI Friday's	(Canziani et al., 2016)
Casual /moderate	ACPP: under $15. "Economical foods are prepared to order in a family-friendly, utilitarian setting" (p. 1478).	Denny's Steak 'n Shake	(Canziani et al., 2016)
Upscale	ACPP: $25 - $39.99. "Units serve superior quality foods with innovative approaches in a relaxed atmosphere and offer higher-end alcoholic beverage menus that include wine, spirits and beer" (p. 1478).	Bonefish Grill, Ruth's Chris Steak House	(Canziani et al., 2016)
Fine dining	ACPP: $40 and over. "Units serve only the finest quality foods, often farm-to-table, are frequently chef-owned, and create unique menu fare that is visually attractive" (p. 1478).	French Laundry	(Canziani et al., 2016)

(ACPP) Average check per person approximates aggregate national means in the USA.

Previous Research on Self-Service Technologies in the Restaurant Industry

The number of studies which examined SSTs and specifically in the restaurant menu context were minimal. One of the recent studies attempted to examine the interactive digital menu and its impact on customer satisfaction within the restaurant industry (Ahn & Seo, 2018). Beldona et al. (2014) investigated the relative efficacy of an e-tablet menu (informational only with no self-ordering capabilities) over the traditional paper-based menu across the parameters of order information quality, menu usability, and ordering satisfaction using customer perceptions. In another study, Dixon et al. (2009) investigated consumer preferences across five different technological innovations utilized by restaurant operators as queue management, internet based reservations and ordering placement, virtual menus, kiosk systems, and payment related systems. Wang and Wu (2014) examined the factors influencing customer intention to use a restaurant iPad menu instead of using the standard menu card. Hartwell, Johns, and Edwards (2016) examined the impact of e-menus and touch screen technology on food service and satisfaction in a large UK hospital. A full list of previous studies which examined SSTs in the restaurant industry is presented in Table 5.

Table 5: Previous Theories Utilized in Previous Studies on SSTs in the Restaurant Industry

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
Kiosk	Dabholkar (1996)	Consumer evaluations of new technology-based self-service options: an investigation of alternative models of service quality (IJRM)	To propose and test alternative models of service quality for technology-based self-service options by drawing on consumer decision-making research.	DMT	Design Scenario based In class questionnaire College students' sample Analysis ANOVA SEM	DV Intention to use SSTs service quality IV Speed of delivery Ease of use Reliability Enjoyment Control Attitude toward SSTs Need for interaction	Enjoyment and control were important determinants of service quality under all three situational conditions (waiting time). Consumers feeling in control over the process of service delivery, enhances consumer evaluations of this process and directly impacts intentions to use SSTs option. Ease of use found to be an important determinant of service quality but only for the high waiting time. Speed of delivery and reliability did not influence evaluations of service quality under any situational condition. SSTs with high quality service delivery option will attract customers to use it. Waiting time as a situational factor influenced intentions to use SSTs.

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
	Dabholkar and Bagozzi (2002)	An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors (JAMS)	To investigate the moderating effects of consumer traits and situational factors on the relationships within a core attitudinal model for technology-based self-service (developed in Dabholkar, 1996).	TRA & TPB	Design Experimental design 2x2 In class questionnaire College student sample Analysis CFA SEM	DV Attitude toward using SSTs Intention to use SSTs MO Consumer traits (self-efficacy, novelty, need for interaction, & self-consciousness) Situational factors (waiting time, social anxiety) IV Ease of use Performance Fun	Marketers should promote the ease of use, or "user friendliness" of their SST especially if market is likely to be low in self-efficacy or, have a high need for interaction with a service employee. The importance of SST performance or "reliability", if the target market is likely to be low in inherent novelty seeking or, high in self-consciousness. Marketers should heavily promote the fun aspect of using their SST, if their target market is likely to be high in inherent novelty seeking, be high in self-efficacy, be highly self-conscious, or have a high need for interaction with a service employee.

(continued)

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
	Kim et al. (2013)	Factors influencing customer acceptance of kiosks at quick service restaurants (JHTT)	To explore the impact of customers' previous experience on their likelihood of using kiosks at quick service restaurants.	N/A	Design Online survey Analysis CFA SEM	DV Intention to use ME Customer readiness MO Gender IV Previous experience Role clarity High ability Extrinsic motivation Intrinsic motivation	Previous SSTs experience positively influenced perceived ability and extrinsic motivations Customer readiness variables were not the only predictors of the intention to use kiosks Previous SSTs experience did not influence use intention. Roles clarity in SST, and higher levels of extrinsic motivations have influence in kiosks usages at QSRs.
	Wei et al. (2017)	The power of self-service technologies in creating transcendent service experiences: the paradox of extrinsic attributes (IJCHM)	To examine how extrinsic and intrinsic attributes of SSTs play role in consumers' satisfaction with SSTs.	TCV EVS	Design Online survey Analysis CFA PLS-SEM	DV Satisfaction with SSTs IV Extrinsic attributes Intrinsic attributes	Extrinsic and intrinsic attributes are important determinants of customer satisfaction with SST. Extrinsic attributes played a greater role in driving consumers' satisfaction with using SSTs. Consumers would favor SSTs usage experience if using SSTs saves time and offers convenience.

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
Tabletop	Ahn and Seo (2018)	Consumer responses to interactive restaurant self-service technology (IRSST): the role of gadget-loving propensity (IJHM)	Examining consumers' perceived quality of SSTs attributes affects their cognitive and affective states and subsequent behavioral intentions and the potential moderating role of consumers' gadget-loving propensity on this mechanism.	S-O-R	Design Online survey MTurk Analysis CFA SEM	DV Intention to use Intention to not to use MO Gadget loving IV Utilitarian quality attributes Hedonic quality attributes	Functionality and customization of SSTs significantly increase consumers' perceived values and positive emotional reactions. Enjoyment has a significant impact on consumers' affective states. Consumers with a high gadget-loving propensity are more likely to display approach behaviors toward SSTs when they have a high level of perceived value. Consumers with a low gadget-loving propensity, positive affective states have a greater impact on their approach behaviors toward SSTs than cognitive evaluations do.

(continued)

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
	Beldona et al. (2014)	Exploring the promise of e-tablet restaurant menus (IJCHM)	To determine the relative efficacy of an e-tablet menu (informational only) over the traditional paper-based menu across the parameters of order information quality, menu usability, and ordering satisfaction using customer perceptions.	N/A	Design Self-administered paper survey. Analysis GLM Multiple regression	DV Satisfaction with SST CV Novelty IV Order information quality Menu usability	The e-tablet menu is significantly superior compared to the traditional menu across all three IVs, order information quality, menu usability, and ordering satisfaction.
	Kimes and Collier (2014)	Ready and willing: restaurant customers' view of payment technology (CHR)	To see whether the type of payment (that is, traditional, smartphone, or table-top tablet) had an impact on customers' perceptions of seven payment options on customers' future patronage and spending intentions.	N/A	Design National panel database survey Analysis EFA CFA ANOVA ANCOVA SEM	DV Spending intentions Satisfaction IV Experience Service Convenience Privacy efficiency payment accuracy	Consumers highly rating smartphones and tablet payment methods over the traditional method, as they increase satisfaction, quality of the payment experience, and the likelihood that they would spend more at the restaurant in the future.

(continued)

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
	Susskind and Curry (2016)	An examination of customers' attitudes about tabletop technology in full-service restaurants (SS)	To examine how customers, react to the use of tabletop devices in a full-service casual dining restaurant	UTAUT2	Design Email survey Analysis ANOVA Multivariate analysis	DV Tip Percentage Likeability IV Effect on Experience. Return intentions CO Party size Meal duration	Customers who used tabletop devices reported positive affect toward the device. Approx. 79% of customers reporting that the device improved their experience, citing convenience, ease of use, and credit card security as some benefits of using the technology. Customers who used the device reported that they would return to the restaurant because of the positive affect.
	Susskind and Curry (2018)	A look at how tabletop technology influences table turn and service labor usage in table-service restaurants (CHQ)	To examine how the introduction of tabletop technology influenced table turn time in the restaurants and how the tabletop technology affected guest–server contact time.	N/A	Design Qualitative Observation sessions in the restaurant Analysis ANOVA Multivariate analysis	N/A	The use of tabletop devices in table-service restaurants is connected to key efficiency gains: reduced table turn time and a reduced need for a portion of service labor. When guests use the tabletop technology to order and pay, it also reduces the amount of service labor needed for the table.

(continued)

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method	Variables	Findings
	Wang and Wu (2014)	Factors influencing behavioral intention to patronize restaurants using iPad as a menu card

(BIT) | To propose and examine a new research model that addresses perceived value by focusing on the functional and emotional factors which influence the behavioral intention to patronize restaurants that use the MenuPad technology. | TCV | Design Online survey (multi-sources)

Analysis method SEM | DV Behavioral intention

IV Usefulness Ease of use Control Enjoyment Novelty Value | All functional factors (i.e. perceived control, perceived usefulness and perceived ease of use) and emotional factors (i.e. perceived enjoyment and perceived novelty) are significantly affecting perceived value. |

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method/Analysis	Variables	Findings
Mobile App	Kapoor and Vij (2018)	Technology at the dinner table: ordering food online through mobile apps (JRCS)	To identifies the most important mobile app attributes while choosing a food ordering apps, and how does it influence the conversion for an online food ordering company.	TRA & TAM	Focus groups Survey Student sample CFA SEM	DV Intention to use IV (Designs) Visual Information Navigation Collaboration	Collaboration design had the highest effect on purchase decision. Information design and navigational design are significantly affects intentions.
	Kwon, Bae, and Blum (2013)	Mobile applications in the hospitality industry (JHTT)	To identify factors influencing consumers to download hospitality related mobile apps.	TAM	National panel database survey EFA Multiple regression	DV Intentions to use IV Usefulness Ease of use	Usefulness was not an only reason to download mobile apps. Consumers who enjoy using smartphones and, confident in themselves are more likely to download the mobile applications.

(continued)

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method/Analysis	Variables	Findings
		Developing and validating a mobile catering app success model (IJHM)	To examine the relationships among catering mobile apps system quality, information quality, service quality, product quality, perceived price, perceived promotions, perceived value, user satisfaction, intention to reuse, and eWOM.	ECSSM ISSM	Online survey PLS-SEM	DV Intention to reuse eWOM IV Information Quality System Quality Service Quality Product Quality Promotions Price Satisfaction Value	Product quality, perceived price, perceived promotions, and eWOM can be added to the e-commerce system success model to form a mobile catering app success model. Perceived value influences eWOM more strongly than user satisfaction. User satisfaction affects intention to reuse more strongly than perceived value.

SSTs	Authors	Title & Journal	Aim of the study	Theory	Method Analysis	Variables	Findings
Website	Gregory et al. (2010)	Towards a functional model of website evaluation: a case study of casual dining restaurants (WHTT)	To propose and apply a conceptual model that can be used to evaluate the functional performance of hospitality and tourism websites.	N/A	Survey Case study	DV Web evaluation dimensions IV (web functionality) Information, Communication, Transactions, Relationships, Technical merit	There is still a gap between customer perceptions of restaurant websites and the potential to use the website. The areas that are found to be lower in functional efficiency are communication, relationship, and transaction.

Notes

IJHM: International Journal of Hospitality Management
IJCHM: International Journal of Contemporary Hospitality Management
IJRM: International Journal of Research in Marketing
JAMS: Journal of the Academy of Marketing Science
JRCS: Journal of Retailing and Consumer Services
JHTT: Journal of Hospitality and Tourism Technology
CHR: Cornell Hospitality Report
SS: Service Science
CHQ: Cornell Hospitality Quarterly
BIT: Behaviour & Information Technology

S-O-R: Stimulus-Organism-Response
DMT: Decision making theory
TRA: Theory of reasoned action
TPB: Theory of planned behavior
TAM: Technology acceptance model
UTAUT2: Unified theory of acceptance & use of technology
TCV: Theory of consumption values
ECSSM: Electronic commerce systems success model
ISSM: Information system success model
EVS: Experiential value scale
WHTT: Worldwide Hospitality and Tourism Themes

Consumers Motives to Utilize SSTs

There are many benefits that SSTs can offer to the restaurant industry consumers. Previous studies show that restaurant customer enjoyed using SSTs for several reasons such as ease of use, convenience, and self-efficacy (Kim et. al, 2013). Other factors that motivate customers to use SSTs in the restaurant industry have been identified in the literature. For example, a study conducted in a full casual restaurant setting found that customers appreciate using a tabletop menu to place their order because it enhances their dining experience and reduces wait time for the server (Susskind & Curry, 2016). Other factors include time and cost savings, greater control over the service delivery, reduced waiting time, a higher perceived level of customization, convenience, and enjoyment from using SSTs (Ahn & Seo, 2018; Dabholkar, 1996; Dabholkar & Bagozzi, 2002; Kokkinou & Cranage, 2013).

Recent industry reports about technology innovation in the restaurant industry and its impact of on the consumer and business relationship revealed that today's customer appreciates the current introduction of these technologies. It is reported that consumers are expected to have SSTs available to them to use in almost all businesses with which they interact (National Restaurant Association, 2017b). Since technology plays an important role in today's world, the first adopters of SSTs in the restaurant industry could reap the benefits from investing in SSTs that enhance their customers' ordering and dining experience. For example, not long ago, Chick-Fil-A, one of the major fast casual restaurants in the United States, introduced mobile apps which provide their customer with more control and customization of their meal plus give customers the loyalty rewards points. Customers can place a drive through order, curbside, or carry out order from the app and earn points for each transaction. Then they can use the earned points for free rewards.

Additionally, recent findings show that the usefulness and convenience of the SST were the top two factors motivating consumers to use the SST for ordering food (Okumus & Bilgihan, 2014). Other studies found that restaurant customers appreciate the order customization and the additional control feature that the SST can provide to their dining experience and, specifically, to the payment process (Collier & Kimes, 2013; Dorcic, Komsic, & Markovic, 2018; Susskind & Curry, 2016; Susskind & Curry, 2018). Consumers tend to adopt mobile apps if they consider them useful, easy to use, and compatible with the current devices they use (Lu, Mao, Wang, & Hu, 2015).

Theoretical Background

This section discusses related theories developed which are used in the SST context. It further includes a discussion about the theory adopted for this study and the development of the study hypotheses. The following chart show the top ten most adopted theories in the SST previous studies which are related to the current study. This chart was developed by the researcher based on reviewing more than 360 academic papers.

- Technology adoption model (TAM)
- Theory of planned behavior (TPB)
- Diffusion of innovation (DOI)
- Theory of reasoned action (TRA)
- The unified theory of acceptance and use of technology model (UTAUT)
- The extended technology acceptance model (TAM2)
- Theory of consumption values (TCV)
- Task technology fit (TTF)
- Self-determination theory (SDT)
- Social cognitive theory (SCT)
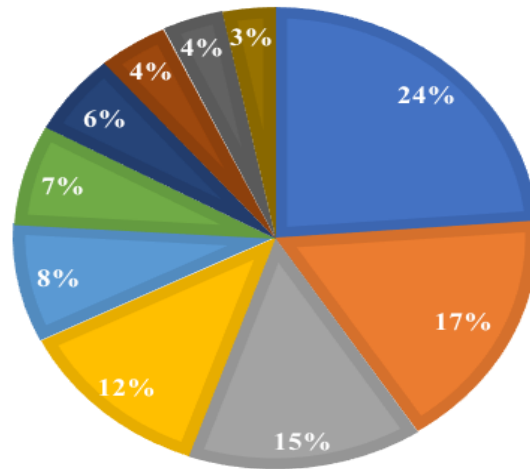
Figure 3: Most Frequently Used Theories in Previous SSTs Studies

The Technology Adoption Model (TAM) was the most adopted theoretical model in the technology related research (Ukpabi & Karjaluoto, 2017). The model was developed by Dives (1989), who suggested that technology adoption behavior was derived by two major constructs: ease of use and usefulness. This model has been criticized from other scholars because of its ignorance of other factors that may have an effect on the intention to adopt a new technology. The model has been extended by Venkatesh and Davis (2000), who named it the extended Technology Acceptance Model (TAM 2). They include image, subjective norms, output quality, perceived ease of use, result demonstrability, and job relevance in addition to two moderators,

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voluntariness and experience. TAM was criticized for its limitations and further developed by (Bagozzi, 2007) who added the hedonic variables and named the model TAM3.

The second most used theory in SST related studies was the Theory of Planned Behavior (TPB) by Ajzen (1991), who claimed that perceived behavioral control is a necessary antecedent to the prediction of behavioral intentions. The TPB theory was further extended by Fishbein and Ajzen (2010) to the Theory of Reason Action (TRA), which suggest that "intention is the best single predictor of behavior but that it is also important to take skills and abilities as well as environmental factors (i.e., behavioral control) into account" (p. 21).

Next was the Diffusion of Innovation Theory (DOI), which was developed by Rogers (1995), who claimed that adopting new technology is based on five characteristics: observability, trial- ability, complexity, relative advantage, and compatibility. The Unified Theory of Acceptance and Use of Technology (UTAUT) comes next in the list, which argues that technology adoption can be explained by performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh, Morris, Davis, & Davis, 2003). This theory was extended to the (UTAUT2) by adding three more constructs: hedonic motivation, price value, and habit (Venkatesh, James, & Xin, 2012).

Others academic works try to look at technology adoption from the technology tasks characteristics and from the consumer point of view. Goodhue and Thompson (1995) developed the Task-Technology Fit Model (TTF), which basically aims to understand the relation between information systems and individual performance by examining those three main constructs: task characteristics, technology characteristics, and individual characteristics. Next is the Social Determination Theory (SDT), which proposes two major constructs (intrinsic motivation and extrinsic motivation) to examine consumers' behavioral intention to use technology (Gagné &

Deci, 2005). Next, the Social Cognitive Theory (SCT) was developed by (Bandura, 2001), and it's been adopted in several SST studies (Im & Qu, 2017; Kim et al., 2017; Lu et al., 2015; Zhu et al., 2013). SCT examined consumers' personal, behavioral, and situational factors that motivate them to utilize certain technology.

Other scholars suggest including satisfaction as a construct to the technology evaluation process, which then leads to the development of the Expectancy Disconfirmation Theory (EDT), first developed by Oliver (1980). The EDT was widely utilized in previous studies in the context of SST such as the studies of Choi, Wang, and Sparks (2018) and that of Shang & Wu (2017).

The Theory of Consumption Values

This section examines the theory of consumption values and its relation to the current study. The study hypotheses will be presented in the following section

The theory of consumption values (TCV) consists of five dimension values as seen in Figure 1 (functional value, conditional value, social value, emotional value, and epistemic value), all of which have an influence on consumers' behavior regarding buying/using or not buying/using a specific product or service (Sheth et al., 1991a, 1991b). TCV also explains why consumers choose one product type over another, and why consumers choose one brand over another (Sheth et al., 1991a, 1991b). The theory authors believed that this theory is applicable to choices involving a full range of product or service types. In the context of this study, TCV is believed to provide valuable insight on the SST values that restaurant customers prefer and further detail which SST platforms restaurateurs should improve to enhance their customer experience. The next section discusses the TCV values in detail and how they are related to the current study.
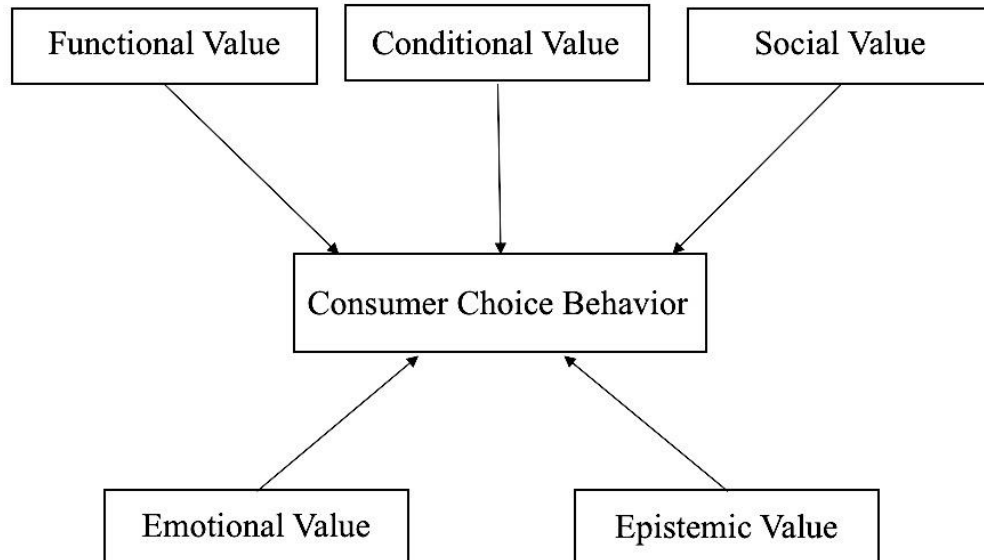
Figure 4: Theory of Consumption Values
Source: Adapted from Sheth et al. (1991a, p. 7).

The use of TCV in this study was supported for the following reasons. First, this theory explains consumer market choice from other alternatives options. Thus, it will help the researcher to understand the consumers' choice of a particular SST type over any other. The adoption of the TCV in this study will also help to predict the key important SST values that influence consumer experience and continuance intention. TCV is believed to help marketers to better understand consumers' wants and needs in order to design an effective SST platform. This also benefits restaurant operators by understanding their customer motives to use a specific type of SST over others so that they can strategically allocate the required resources to invest in the most useable, profitable SSTs that will eventually deliver an exceptional dining experience to their customer. Another benefit that TCV has is the ability to explain the salient motives behind using a particular type of SST.

The theory is designed to understand consumer market choice behavior. By gaining more knowledge about the factors that impacts the consumer's decision to use or not to use a SST, the

service, industry professional can tailor the SST to suit customer expectations. TCV is expected to help restaurant managers to allocate the required resources to successfully implement SSTs that address a customer's needs and wants. It is also helps restaurant companies who have already implemented SSTs in their restaurants to address any shortcomings and improve their SST productivity.

The theory of TCV examined the consumer's choice behavior from five dimensions, with each one capturing specific and unique information. For instance, the first dimension in the TCV model is the functional value dimension, which includes three major factors: money, time, and effort required to a specific market choice (to buy/not to buy; to use/not to use), which is considered to be an important factor to service consumption decision (Sheth et al., 1991b). This means that when examining the aspect of time in SSTs by utilizing TCV, the industry professional can assess the current and future SST investment and ensure that customers reaps the benefits from its use.

Another advantage of utilizing this theory is related to its capability to understand a consumer's motives to choose using a specific SST over another, from five comprehensive dimensions: functional, emotional, social, conditional, and epistemic (Sheth et al., 1991b). For instance, understanding a consumer's motives behind utilizing the kiosk, tabletop tablet, mobile app, or web-based SST will certainly help restaurant companies to identify the best SSTs for their business and for their customers. The adoption of TCV in this dissertation is expected to provide the restaurant industry professional with a better understanding of the importance of aligning SST capabilities with the target market and prevent unnecessary investment.

Functional Value

Functional value is defined as "the perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance. An alternative acquires functional value through the possession of salient functional, utilitarian, or physical attributes. Functional value is measured on a profile of choice attributes" (Sheth et al., 1991a, p. 18). These authors believed that functional value is the primary driver of consumer choice (such as reliability, durability, and price). McFadden (1986) suggest that functional value is a major determinant of consumer choice.

Other definitions of functional value emphasized its significant impact on the consumer's decision. For instance, Haumann, Güntürkün, Schons, and Wieseke (2015) described functional value as "the utility customers derive from the perceived efficiency and convenience of the coproduction process" (p. 27). Wang & Wu (2014) suggested that functional dimension is more about the practicability, efficiency, and utilitarian evaluations made by consumers. Functional value was also linked to the speed of service delivery (Djelassi, Diallo, & Zielke, 2018). It is also seen to be closely related to the concepts of perceived usefulness, which is a key construct in the Technology Acceptance Model (TAM) developed by Davis (1989).

Functional value is therefore defined in this study as an overall assessment of value incorporating quality, the traditional value for money, and convenience characteristics.

Emotional Value

Emotional value is defined as "the perceived utility acquired from an alternative's capacity to arouse feelings or affective states. An alternative acquires emotional value when associated with specific feelings or when precipitating or perpetuating those feelings. Emotional value is measured on a profile of feelings associated with the alternative." (Sheth et al., 1991a, p.

20). Emotional value is further explained by Kerviler, Demoulin, and Zidda (2016) as the "utility derived from feelings or affective states generated by mobile services" (p. 335). Emotional value is therefore defined in this study as those attributes of SSTs that capture the feelings of pleasure and enjoyment in the restaurant customer.

Social Value

Social value is defined as "the perceived utility acquired from an alternative's association with one or more specific social groups. An alternative acquires social value through association with positively or negatively stereotyped demographic, socioeconomic, and cultural-ethnic groups. Social value is measured on a profile of choice imagery." (Sheth et al., 1991a, p. 19). It is suggested that social value derives from an enhanced social self-efficacy (Sweeney & Soutar, 2001).

Social value is therefore defined in this study as the social pressure that influences a consumer's decision to use or not to use SSTs in the restaurant context.

Epistemic Value

Epistemic value is defined as "the perceived utility acquired from an alternative's capacity to arouse curiosity, provide novelty, and/or satisfy a desire for knowledge. Alternatives acquires epistemic value through the capacity to provide something new of different" (Sheth et al., 1991a, p. 21).

Epistemic value is defined in this study as the consumer interest and curiosity to try new ways to order food by trying new SSTs.

Conditional Value

Conditional value is defined as "the perceived utility acquired by an alternative as the result of the specific situation or set of circumstances facing the choice maker. An alternative acquires conditional value in the presence of antecedent physical or social contingencies that enhance its functional or social value. Conditional value is measured on a profile of choice contingencies" (Sheth et al., 1991a, p. 22).

Previous study linked conditional values to situational factor and empirically identified three conditional factors: perceived waiting time, perceived task complexity, and companion influence (Wang, Harris, & Patterson, 2012). Situational factors can also include the "time of day, day of the week, crowded conditions, relative length of lines at alternative checkouts, and whether the consumer was in a hurry" (Dabholkar et al., 2003, p. 67).

Conditional value is therefore defined in this study as predicted and unpredicted factors that might change the normal choice of the customer in terms of using/not using SSTs in the restaurant context such as being in hurry, crowded restaurant or long queue, weather conditions, coupons, and promotions.

Additional SSTs Features

In this study, three additional SSTs (interactive features, customization features, and privacy features) are included in the theoretical model to capture a clearer picture of the restaurant customer evaluations for the four types of SSTs. These SST values were adopted from previous related models SSTQUAL (Line & Hsieh, 2011) and the Website Flow Model (Skadberg & Kimmel, 2004).The next sections discuss the three additional SSTs values in detail.

Interactive Values

Most of the previous literature defined interactive features in the website context (Han & Mills, 2006; Skadberg & Kimmel, 2004). For instance, a study examined the traveler's perspectives of online travel web-based service defined interactive features as the "items that trigger a responsive behavior from online travelers such as sending inquiring emails or planning trips to the destination through the website" (Han & Mills, 2006, p. 415). A recent study found that website interactive features as one on the most significant e-service quality dimensions influences customers' experience in the travel related websites (Wani, Raghavan, Abraham, & Kleist, 2017). Another study in the hotel website context emphasized the importance of interactive features to the success of a hotel website (Scharl, Wöber, & Bauer, 2003). Furthermore, interactive features were found to enhance online shipping efficiency and provide enjoyment experience (Schaupp and Belanger, 2005; Lee & Chang, 2011). Furthermore, it is noted that websites' interactive features are positively related to customer satisfaction with the online shopping experience and behavioral intention (Fiore & Jin, 2003).

Customization Values

Customization is defined as "a consumer's personal preference for designing and interacting with adaptive online environments to create valuable e-service experiences" (Mathwick, Wagner, & Unni, 2010, p. 11). In the SSTQUAL model, customization was defined as "the degree to which an SST can be altered to fit individual customer preferences and transaction histories" (Line & Hsieh, 2011, p. 198). From the service industry context, customization is defined as "the process in which consumers choose attributes from predefined service modules to compose their most preferred alternatives" (Wang, Kandampully, & Jia, 2013, p. 84). Customization feature in the restaurant interactive technologies positively impact

customer perceived values and emotional values (Ahn & Seo, 2018). Furthermore, customization features in SST are found to be effective in establishing site loyalty (Kasavana, 2002).

Privacy Values

In the technology context, privacy refer to the degree to which the customer believes that the technology platforms she/he uses is safe from security breaches and disclosures of personal information (Parasuraman, Zeithaml, & Malhotra, 2005). The SSTQUAL model describes privacy values as a platform that protected from "intrusion, fraud, and loss of personal information" (Line & Hsieh, 2011, p. 198). Parasuraman et al. (2005) stress on the importance of privacy values in SST related transactions. Within the restaurant industry context, 79% of restaurant customers who used tabletop menus are valuing this feature because it enhances their credit card security (Susskind & Curry, 2016). Frequent website users also reported that privacy features are very critical to their continuance intention to use the same platform for future purchases (Ghosh, 2018).

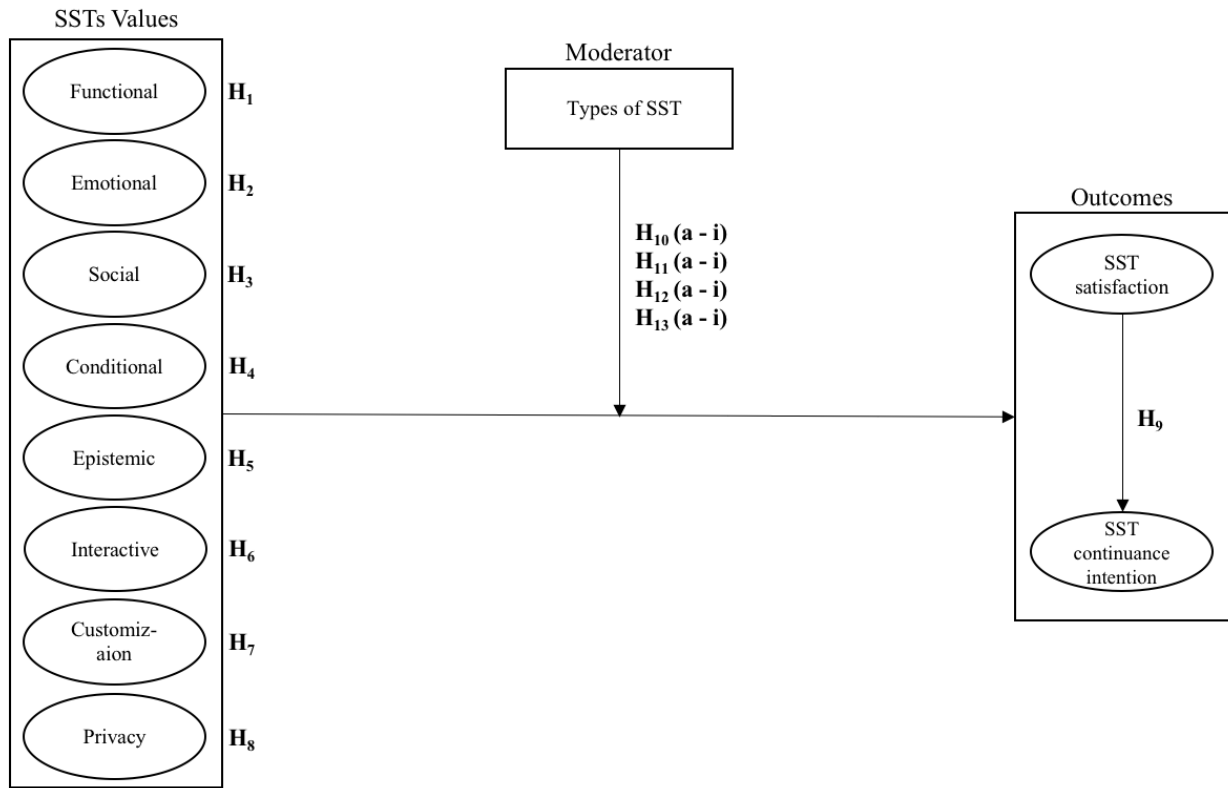## Conceptual Framework

Figure 5: Conceptual Framework

Study Constructs Explanations

This section presents the definition of study constructs and their theoretical roots. Table 6 outlines the study constructs.

Table 6: Construct Conceptual Definitions and Theoretical Roots

Category	Construct	Definition	Theoretical roots
Outcomes	Satisfaction	"A function of expectation and expectancy disconfirmation, which is believed to influence attitude change and purchase intention" (Oliver, 1980, p. 15).	EDT
	Continuance intention	"A deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1999, p. 34).	EDT
Types of SST	Kiosks	"A kiosk generally refers to a self-service machine which allows customers to order food and other services without encountering an employee, and it is one of the most common and popular type of SSTs utilized in the restaurant industry, including self-order kiosks with touch screen, tabletop ordering devices, and drive-thru kiosks" (Kim et al., 2013, p. 41).	
	Tabletop menus	A touch screen device placed on the restaurant table, featuring an interactive menu that allows customers to view, order, and customize their order directly without having to wait or getting help from the server.	
	Mobile apps	A smartphone application owned and operated by the restaurant company. The apps allow consumers to look at the restaurant menus, access nutrition information, make order from the apps dine-in & out with fully customization functions, payment done through the apps, and memberships rewards also can be managed using the same apps.	
	Web-based SST	A website that provides customers with complete functionality of online ordering, customization, and payment.	
SSTs values			
	Functional Values	"The perceived utility acquired by an alternative as the result of its ability to perform its functional, utilitarian, or physical purposes. Alternatives acquire functional value through the possession of salient functional, utilitarian, or physical attributes" (Sheth et al., 1991a, p. 18).	TCV

(continued)

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Category	Construct	Definition	Theoretical roots
SSTs values			
	Emotional Values	"The perceived utility acquired by an alternative as a result of its ability to arouse feelings or affective states. Alternatives acquire emotional value when associated with specific feelings or when they facilitate or perpetuate feelings" (Sheth et al., 1991a, p. 20).	TCV
	Social Values	"The perceived utility acquired by an alternative as a result of its association with one or more specific social group. Alternatives acquire social value through association with positively or negatively stereotyped demographic, socioeconomic, and cultural ethnic groups" (Sheth et al., 1991a, p. 19).	TCV
	Epistemic Values	"The perceived utility acquired by an alternative as a result of its ability to arouse curiosity, provide novelty, and/or satisfy a desire for knowledge. Alternatives acquire epistemic value through the capacity to provide something new or different" (Sheth et al., 1991a, p. 21).	TCV
	Conditional Values	"The perceived utility acquired by an alternative as a result of the specific situation or the context faced by choice maker. Alternatives acquire conditional value in the presence of antecedent physical or social contingencies that enhance their functional or social value, but do not otherwise possess this value" (Sheth et al., 1991a, p. 22).	TCV
	Interactive Values	"The extent to which users can participate in modifying the form and content of a mediated environment in real time" (Steuer, 2006, p. 84).	IT Flow
	Customization Values	"The degree to which an SST can be altered to fit individual customer preferences and transaction histories" (Lin & Hsieh, 2011, p. 198).	SSTQUAL
	Privacy Values	"The perceived safety from intrusion, fraud, and loss of personal information" (Lin & Hsieh, 2011, p. 198).	SSTQUAL

Conceptual Model
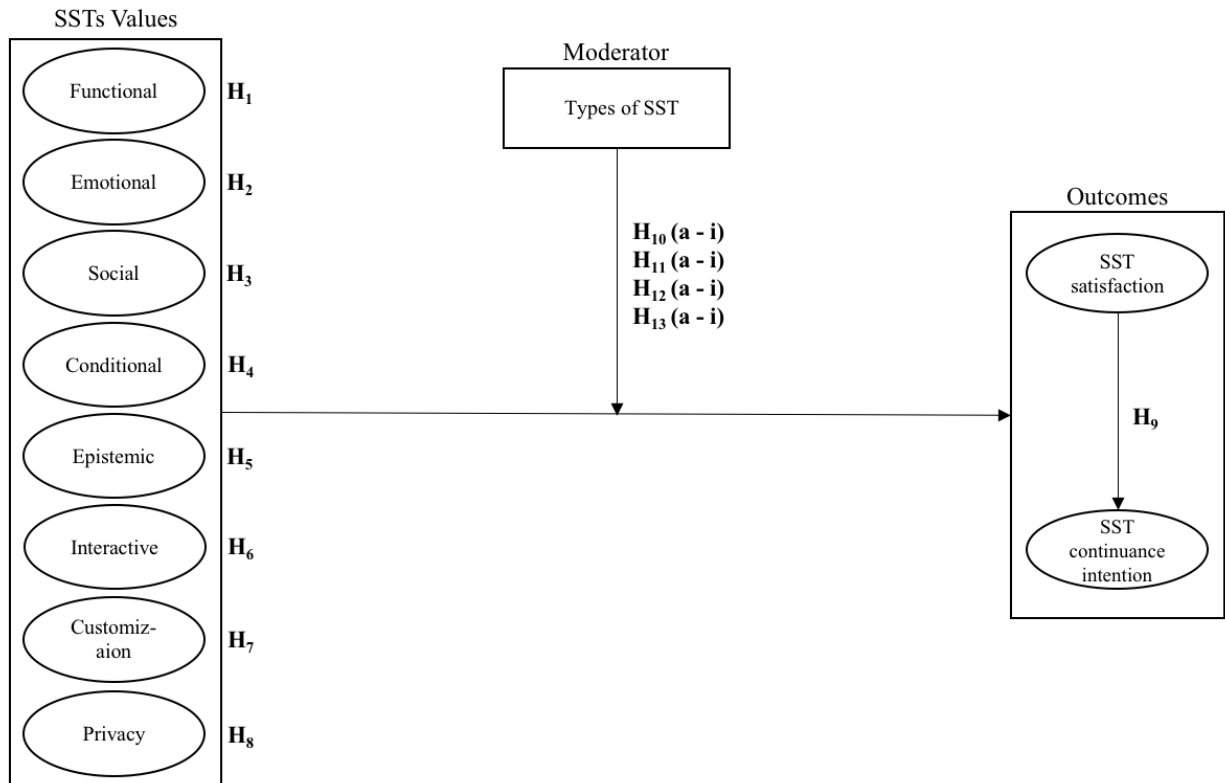
Figure 6: Conceptual Framework Includes the Study Hypotheses

Study Hypotheses

A total of 45 hypotheses were derived from the literature and the proposed theoretical model.

H1. Functional values will have a positive impact on customer satisfaction with SST.

H2. Emotional values will have a positive impact on customer satisfaction with SST.

H3. Social values will have a positive impact on customer satisfaction with SST.

H4. Epistemic values will have a positive impact on customer satisfaction with SST.

H5. Conditional values will have a positive impact on customer satisfaction with SST.

H6. The interaction features available in SST will have a positive impact on customer satisfaction with SST.

H7. The customization features available in SST will have a positive impact on customer satisfaction with SST.

H8. The privacy features available in SST will have a positive impact on customer satisfaction with SST.

H9. Customer satisfaction with SST will have a positive impact on customer continuance intention towards SST in the restaurant context.

$H10_a$. The influences of functional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_b$. The influences of emotional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_c$. The influences of social values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_d$. The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_e$. The influences of conditional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_f$. The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_g$. The influences customization features on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_h$. The influences of privacy feature on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.

$H10_i$. Customer satisfaction with SSTs will have a positive impact on customer continuance intention towards restaurant kiosk.

$H11_a$. The influences of functional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_b$. The influences of emotional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_c$. The influences of social values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_d$. The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_e$. The influences of conditional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_f$. The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_g$. The influences customization features on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_h$. The influences of privacy feature on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.

$H11_i$. Customer satisfaction with SSTs will have a positive impact on customer continuance intention to reuse restaurant tabletop tablet.

$H12_a$. The influences of functional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_b$. The influences of emotional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_c$. The influences of social values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_d$. The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_e$. The influences of conditional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_f$. The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_g$. The influences customization features on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_h$. The influences of privacy feature on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.

H12$_i$. Customer satisfaction with SSTs will have a positive impact on customer continuance intention to reuse restaurant branded mobile app.

H13$_a$. The influences of functional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_b$. The influences of emotional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_c$. The influences of social values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_d$. The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_e$. The influences of conditional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_f$. The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_g$. The influences customization features on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_h$. The influences of privacy feature on customer satisfaction with SSTs will be different for restaurant website than the other SST types.

H13$_i$. Customer satisfaction with SSTs will have a positive impact on customer continuance intention to reuse restaurant website.

Chapter Summary

This chapter described the background and the evolution of the SSTs in general and specifically in the restaurant industry. The most widely adopted SSTs were discussed, along with the reasons in which the restaurant decided to implement such technologies. This study adopted the theory of consumption values to examine the SST values from the restaurant customer perspectives. The five dimensions of the TCV were discussed in detail and how they might contribute to customer satisfaction with SSTs as well as their continuance intention. The conceptual model in this study was then presented with the proposed study hypotheses.

CHAPTER THREE: METHODOLOGY

Chapter Overview

This chapter outlines how the research was conducted by providing information about the research design, approach, and techniques that were used to collect the study data. The chapter is structured in sections. First, an overview about the research design is presented. The second section provides a discussion about the study population and sampling techniques. Next, survey development and measurement items are discussed. Data collection procedures are discussed next, followed by information about the proposed statistical method utilized for analyzing the data. Finally, a summary of the chapter is provided.

Research Design

The main aim of this study is to examine how SSTs value dimensions' influence restaurant customers' SST satisfaction and continuous intentions. After examining related literature on the major proposed constructs in the study, 45 hypotheses were developed and presented in chapter two. In order to examine the hypothesized relationships, a quantitative research approach was utilized by using the survey research method. This method was chosen because it provides wide sample coverage, which can increase the possibility to generalize study results to similar populations (Fowler, 2014).

To collect the data for this study, online questionnaires with four scenarios (kiosk, tabletop, mobile app, and web-based SST) were developed using Qualtrics and distributed via Amazon mechanical Turk (MTurk). The data was analyzed using partial lease square structural equation modeling technique (PLS-SEM) with multi-group analysis (MGA) to examine the difference between groups (Hair, Hult, Ringle, & Sarstedt, 2017).

Sampling Frame

The population of this study is general restaurant customers in the United States who are 18 years old of age or older. The reason behind including all restaurant customers in the study population is to provide the equal opportunity to all general restaurant customers to participate in the study. However, it is hard to reach all restaurant customers in the US. For that reason, the non-probability sampling method was employed (Zikmund, Babin, Carr, & Griffin, 2013). Thus, the purposive sampling technique was utilized to select the study subjects who have used SSTs (kiosk, tabletop, mobile app, or web-based SST) in the restaurant context within the past three months. Purposive sampling is chosen because it selects participants that are more representative of the study population by filtering out subjects that do not meet the study requirements (Xian &

Meng-Lewis, 2018). This method is in accordance with the current study objectives because the study participants was chosen based on specific characteristics that satisfy the study objective (Zikmund et al., 2013). The target sample of the study is general restaurant customers who have used one of the SSTs included in this study (kiosk, tabletop, mobile app, or web-based SST) in the past three months. The three-month period was chosen to minimize possible bias when participants recall their SST experience.

The sample size of this study was determined by following the rule that the minimum sample size required to run PLS-SEM should be ten times the maximum number of arrowheads pointing at a latent variable anywhere in the PLS path model (Hair et al., 2017). Thus, the minimum required sample for this study is 51 observations; however, this study compares four types of SSTs which represent major components for the study and may require a larger sample size. To determine the required sample size for this study and based on previous studies, G*Power analysis was conducted (Bilro, Loureiro, & Ali, 2018; Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007). The G*Power results indicate that a total of 600 observation would be an acceptable sample size to conduct PLS-SEM with multi-group analysis (MGA) in this study (Rasoolimanesh, Ringle, Jaafar, & Ramayah, 2017). This minimum sample size is believed to be adequate to account for incomplete responses, missing data, and other factors that might affect data analysis procedures.

Questionnaire Development

A self-administered questionnaire was developed to conduct the survey. The questionnaire was designed in five sections including screening questions, restaurant information, main construct measurements, SSTs experience outcomes, and sociodemographic information.

The first section consisted of screening questions, which sorted out restaurant customers who have used SSTs in the restaurant context within the past three months. The second section was about general information about the restaurant customers who use SSTs include the name and the type of restaurant, meal type, and the frequency of SST usages. The third section was design to measure the proposed SSTs values and how restaurant customers evaluate restaurant SSTs. The fourth section involved the restaurant customer satisfaction with SSTs and their intention to continue using SSTs. All items in the third and fourth sections of the questionnaire were measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) because it is consistent with previous studies in the literature. The final section in the questionnaire was utilized to capture the sociodemographic information from the participants including gender, age, marital status, level of education, occupational status, and annual income. This section also included an open-ended question for participants who would like to provide extra information about their SSTs experience.

Measurement Items

As mentioned previously, each construct in the study was measured using multiple-item scales, adapted and extended from prior research and reworded to relate specifically to the current context of the study (SST values in the restaurant industry).

All meausrements in this study were previously tested and adopteed from the past studies. They are believed to be valid and reliable. SSTs functional values were measured in five items adopted from Lin and Hsieh (2011). To measure the emotional SST values, four items were adopted from Sweeney and Soutar (2001). SST conditional values were measured by five items adopted from previous studies (Lin & Huang, 2012; Mallat et al., 2009). To measure the SSTs social values, three items were adopted from Sweeney and Soutar (2001). The epistemic values

of SSTs were measured by three items adopted from Donthu and Garcia (1999). Customer satisfaction with the SSTs was measured by three items adopted from the American customer satisfaction index, developed by Fornell et al. (1996). Finally, customer intention to continue use SSTs was measured in three items adopted from Taylor and Todd (1995). All the above-mentioned measurement items were measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). More details about the measurement items, construct's operational definitions, and their original sources are summarized in Table 6.

Finally, to ensure item validity, attention-check questions and speeding tarps were included in the questionnaire to make sure that the participants are paying attention while completing the survey and to enhance data quality as well (Dillman, Smyth, & Christian, 2014). For example, participants maybe asked a similar question to this "please select strongly agree for this question to demonstrate your attention during the survey". Another example that can be used for the attention check question is something like this, on a scale from 1 to 7, an item that reads, "please select four for this item", assesses if the respondent is paying attention when providing answers or not (Kung, Kwok, & Brown, 2018).

Table 7: Measurement Items

Construct	Operational definition	Measurement items (7-point Likert scale)	Sources
Functional value (5 items)	"Functional value is measured on a profile of product attributes relating to pertinent functional, utilitarian, or physical benefits and problems." (Sheth et al., 1991a, p. 83).	I can get my service done with the (SSTs type) in a short time. The instruction and the process of using (SSTs type) is clear. Using (SSTs type) requires little effort. I can get my service (meal order and payments) done smoothly with the use of (SSTs type). Each service item/function of the (SSTs type) is error-free.	(Lin & Hsieh, 2011)
Emotional value (4 items)	"Emotional value is measured on a profile of personal feelings, representing emotions aroused by choice alternatives" (Sheth et al., 1991a, p. 85).	I enjoy using (SSTs type) while ordering my meal. Using (SSTs type) gives me pleasure. I feel relaxed while using (SSTs type). Using (SSTs type) to order my meal makes me feel good "happy".	(Sweeney & Soutar, 2001)
Social value (3 items)	"Social value is measured on a profile of social imagery representing the association of choice alternatives with specific demographics, socioeconomics, and cultural-ethnic groups" (Sheth et al., 1991a, p. 84).	Using (SSTs type) helps me to feel accepted by "among" others. Using (SSTs type) makes a good impression on other people. Using (SSTs type) gives me social approval.	(Sweeney & Soutar, 2001)

(continued)

Construct	Operational definition	Measurement items (7-point Likert scale)	Sources
Epistemic value (3 items)	"Epistemic value is measured by questionnaire items referring to curiosity and the perceived satisfaction of novelty and knowledge needs. Products provide epistemic value by offering something new, different, and interesting." (Sheth et al., 1991a, p. 86).	I used (SSTs type) to experiment new ways of ordering my meal. I used (SSTs type) to test the new technologies. I used this (SSTs type) services out of curiosity.	(Donthu & Garcia, 1999)
Conditional value (4 items)	"Conditional value is measured on a profile of situational contingencies contributing to temporary functional and social utility. These contingencies represent circumstances antecedents to and influencing choice, often causing the consumer to deviate from her or his planned or typical pattern of behavior." (Sheth et al., 1991a, p. 86)	If I have no other options/choices to order at/from this restaurant. If I am in a hurry or have limited time. If there are long lines in the restaurant order counters. If (SST type) provides me promotional code/ reward points for redemption. (or discounts).	(Lin & Huang, 2012a) (Mallat, Rossi, Tuunainen, & Öörni, 2009)

Construct	Operational definition	Measurement items (7-point Likert scale)	Sources
SSTs Interactive features (2 items)	This study defines interactive features as those options that allow customers to request, modify order or service (i.e. call the server, live kitchen camera, and other entertainments features).	Using the (SST) provided me an interactive experience. I felt I had control over my interaction with the restaurant SST	(Pallud, 2017)
Customization (2 items)	"The degree to which an SST can be altered to fit individual customer preferences and transaction histories" (Lin & Hsieh, 2011, p. 198).	The restaurant SST meets my specific needs The restaurant SST has features that are personalized for me.	(Lin & Hsieh, 2011)
Privacy (2 items)	"The perceived safety from intrusion, fraud, and loss of personal information" (Lin & Hsieh, 2011, p. 198).	My personal information is treated confidentially when I use this SST. I feel safe in my transactions when I use this restaurant SST	(Lin & Hsieh, 2011)
Satisfaction with SST (3 items)	"Satisfaction is a summary evaluation of the entire product/service use experience for this single experience" (Spreng, MacKenzie, & Olshavsky, 1996, p. 22).	Overall, I am satisfied with the (SSTs type) offered by the restaurant. The (SSTs type) offered by the restaurant exceed my expectations. The (SSTs type) offered by the restaurant is "the best SSTs" "my favorite way to order compared to other alternatives" "the perfect SSTs I have experienced"	(Fornell et al., 1996)
SST continuance intentions (3 items)	Users' intention to continue using SSTs (Bhattacherjee, 2001).	I intend to continue using this (SSTs type) for restaurant menu ordering in the future. I will continue using this (SSTs type) for restaurant menu ordering in the future. I will regularly use this (SSTs type) for restaurant menu ordering in the future.	(Taylor & Todd, 1995)

Data Collection

An online self-administered questionnaire was designed in Qualtrics and distributed through Amazon Mechanical Turk (MTurk). Four versions were developed to capture restaurant customers' perception of each SST included in this study. At the beginning of each survey, participants were asked this question to ensure that the required characteristic was met: "Have you used a restaurant "Type of SSTs" in the past three months?". The survey versions were categorized as follows:

Survey version 1: For restaurant customers who used a restaurant kiosk in the past three months.

Survey version 2: For restaurant customers who used restaurant tabletop tablet menus in the past three months.

Survey version 3: For restaurant customers who used restaurant branded mobile apps in the past three months.

Survey version 4: For restaurant customers who used a restaurant website in the past three months.

To ensure equal representation of each groups (types of SSTs), quota sampling technique was utilized, following Sheth et al. (1991a) recommendations for future studies.by stating "the survey sample should be selected so as to include an approximately equal number of respondents from each groups of interest" (p. 103).

The utilization of the online questionnaire technique is believed to provide quick responses if compared to the traditional survey approach and allows the researcher to enhance the demographic distribution of respondents (Dillman et al., 2014; Fowler, 2014). In this study, MTurk was used for data collection since the quality of data is believed to be reasonable and

reliable (Kees, Berry, Burton, & Sheehan, 2017; Mason & Suri, 2012). Furthermore, MTurk participants are demographically diverse than those of other online survey platforms, and the respondent sample pool is considerably enormous with multicultural background and diverse in terms of sociodemographic data (Paolacci, Chandler, & Ipeirotis, 2010). Previous studies in the hospitality and tourism fields have also widely utilized MTurk platform for collecting data in a similar context (Im & Qu, 2017; Zhang, Jahromi, & Kizildag, 2018). Hence, MTurk was utilized to collect data for this study.

Prior to data collection, a series of steps were followed. First, IRB requirements at the University of Central Florida were addressed. Second, the questionnaire items were checked by a panel of experts to ensure that the survey is free from related design issues such as unclear instructions, questions order illogically, irrelevant or poorly worded questions that respondents misinterpret and for which they provide invalid answers (Fowler, 2014). A pilot test was conducted on a similar sample that shares similar characteristics with the sample that the main study is going to target to further improve the scales and to ensure that survey design is free from any problems related to survey wording and to make sure that respondents understand the directions and questions (Dillman et al., 2014).

Data Analysis Procedures

The unit of analysis in this study is a restaurant customer who had used a kiosk, tabletop, mobile app, or restaurant website within the past three months.

The researcher used Stata SE version 15 for the preliminary examination of the data including missing data and outliers following the directions suggested by Hair, Black, Babin, and Anderson (2010). Descriptive analysis was performed for respondents' sociodemographic and SST experience. Next, to validate the proposed measurement model and test the study

hypotheses, PLS-SEM with Multi-group analysis (PLS-MGA) was used to conduct the

comparison between the four types of SST. One strength of PLS-SEM is relationship predictions

(Hair, Ringle, & Sarstedt, 2011), which is in accordance to the current study objectives as

mentioned earlier. The PLS-SEM method was chosen because of its ability to handle a more

complex structural model with many constructs and indicators with greater flexibility in terms of

the assumption of normal data distribution, which is required in CB-SEM (Hair et al., 2017; Hair

et al., 2011). To examine differences across the types of SSTs, PLS-MGA was utilized to test if

there are statistically significant differences among the SSTs (Hair et al., 2017). SmartPLS 3,

path modeling software packages for PLS-SEM, was used to examine the study model (Ringle,

Wende, & Becker, 2015).

PLS-SEM Model Assessment

In this study, the measurement model was assessed using multiple indexes. First, the

internal consistency of the measurement model was examined through the composite reliability

the by Cronbach's alpha. Composite reliability measure "takes into the different outer loadings

of the indicator variables" and it is repotted in the same way as Cronbach's alpha (Hair et al.,

2017, p. 111). A Cronbach's alpha higher than 0.7 is the recommended cutoff value (Hair et al.,

2010).Next, the convergent validity (CV) was examined, CV is defined as the "extent to which a

measure correlates positively with alternative measures of the same construct" (Hair et al., 2017,

p. 112). CV was assessed by the average variance extracted (AVE). The threshold value of AVE

is 0.5, any values above this threshold demonstrate a good convergent validity (Hair et al.,

2010). Next, discriminant validity was examined by the Heterotrait–Monotrait Ratio (HTMT) to

check if a construct is truly distinct. The HTMT is a new approach proposed by Henseler,

Ringle, and Sarstedt (2015) to assess discriminate validity. The HTMT approach is "an estimate

of what the true correlation between two constructs would be, if they were perfectly measured" (Hair et al., 2017, p. 118). A true correlation between two constructs that are close to a value of 1 indicate a lack of discriminant validity (Hair et al., 2017).

Since this study collected the data from a single source, common method bias was a potential concern that needed to be controlled (Podsakoff, MacKenzie, & Podsakoff, 2012). Common method bias can be controlled by using two main approaches: procedural and statistical remedies (Podsakoff et al., 2012). To control the common method bias through procedural remedies, the researcher must "identify what the measures of the predictor and criterion variables have in common and eliminate or minimize it through the design of the study" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, p. 887). In this study, the researcher addressed the issue of common bias by "including a psychological separation by using a cover story to make it appear that the measurement of the predictor variable is not connected with or related to the measurement of the criterion variable" (Podsakoff et al., 2003, p. 887). Additionally, to minimize social desirability issues, the authors controlled this bias source by assuring respondents' anonymity and by informing them that there are no correct or wrong answers and they should only answer the question based on what they feel. (Podsakoff et al., 2003; Podsakoff et al., 2012).

In terms of the statistical remedies, this study utilized the most commonly used test to examine common method bias, the Harman's single-factor test (Tehseen, Ramayah, & Sajilan, 2017). In this method, all items from all constructs in the study were loaded into a factor analysis to check whether one single factor emerges or whether single general factor results to the majority of the covariance among the measures; if no single factor emerges that accounts for the

majority of the covariance, this shows that common method bias is not a major concern for the study (Podsakoff et al., 2003; Tehseen et al., 2017).
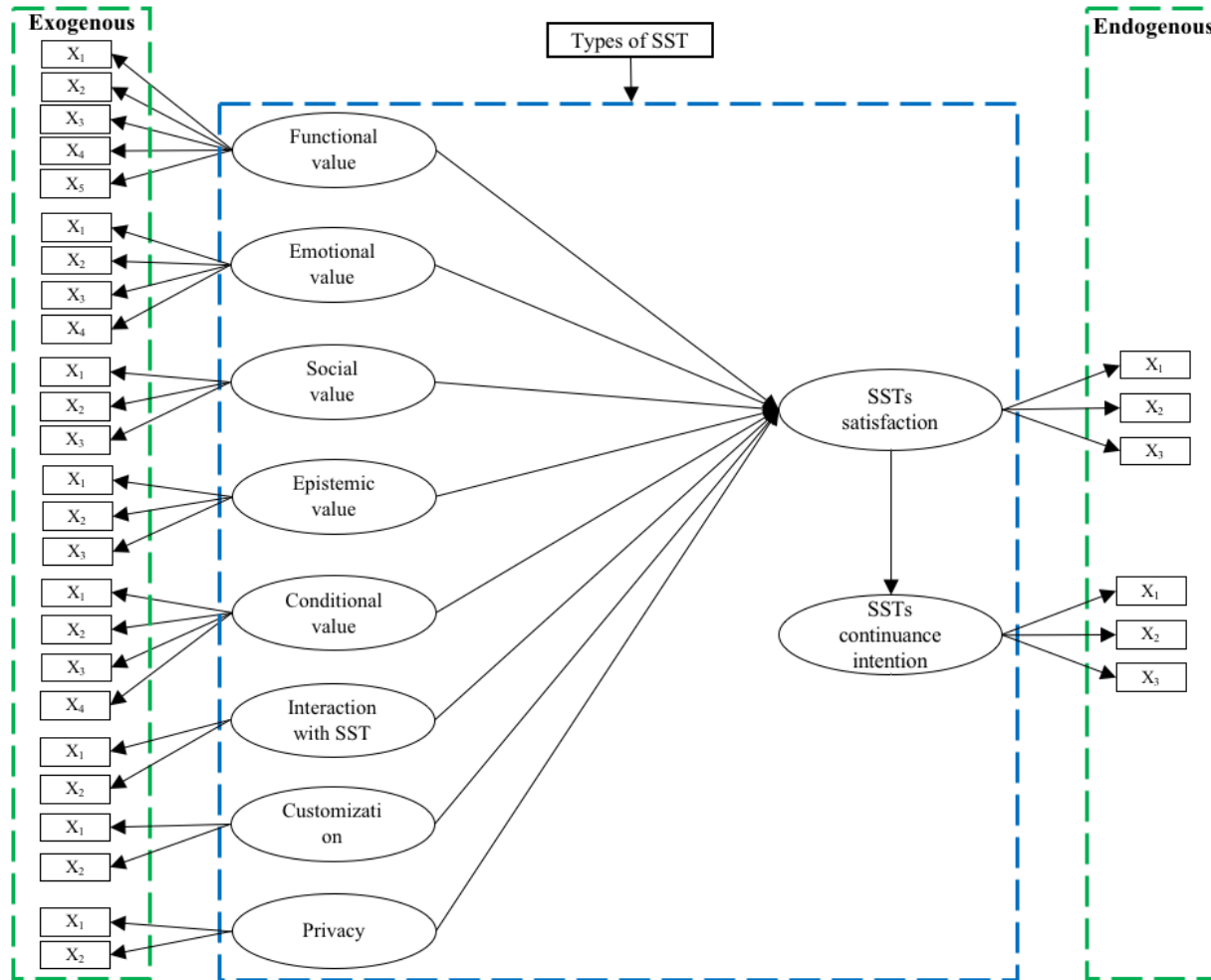
Proposed Measurement Model

Figure 7 The Measurement Model

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Chapter Summary

This chapter described the research methodology used to conduct this study. The current study utilized the quantitative research approach with survey research strategy to examine the hypothesized relationships. An online self-administered questionnaire was designed in Qualtrics and distributed in MTurk. In this study, convenience sampling technique was used to collect data from study participants. The chapter concludes by explaining the data analysis procedures proposed for the current study.

CHAPTER FOUR: FINDINGS

Chapter Overview

In this chapter, the results of the of the analysis of the data collected from US restaurant customers who used SSTs are presented and discussed. The first section in this chapter provides some descriptive statistics and sociodemographic characteristics of the study participants. The second section of this chapter discusses the assessment procedures of the measurement model. In the final section of this chapter, the structural model results across the four types of SSTs are presented and discussed.

Data Collection

Four version of surveys were published online to collect the required data for this study. The surveys were designed in Qualtrics and distributed in Amazon Mechanical Turk (MTurk). The process of data collection began in the second week of May 2019. To prevent potential participants filling out multiple survey, each survey was published for six hours only. After closing the current active survey, the next one was not made available for another six hours. The data collection process was complete in 24 hours for all four SSTs survey versions.

The target population for this study was set as restaurant customers in the United States who are 18 years old of age or older and who had used SSTs within the past three months. Further requirements were set for participants to be eligible to take the online survey. First, respondents had to consent for their participation in the survey, that they agree to participate, and prove that they met the minimum age requirement. Next, a screening question appeared in each survey illustrated by a picture of the SST related to each survey versions. asked the participants. For example, in the kiosk survey, participants were asked this question to assess their eligibility for the study: "Have you used a kiosk to order at a restaurant within the past three months?". If respondents selected "No", then they were directed to the end of survey because they did not meet the minimum requirements. Respondents who met the minimum requirements were compensated with $0.35 cents for completing the survey.

The minimums required sample size for each group was 127 observations. To account for missing data and unengaged survey respondents, the researcher specified the required sample for each survey in MTurk HITs request to 150 observations per group. A total of 600 responses was the required number of complete surveys needed in order to conduct the statistical analysis for the four SSTs groups. In the Qualtrics survey project webpage, a total of 723 surveys were

completed; however, this number included all surveys regardless of their completion progress. For instance, some the surveys were stopped at 2% of completion because participants did not meet the minimum requirements (did not agree to participate in the study, did not meet the minimum age requirement, or did not use an SST in the restaurant context within the past three months). After removing all uncompleted surveys from the data set, a total of 634 completed surveys were received from MTurk and were placed in a category for further screening. The next section presents the data screening procedures followed prior to conducting the main statistical analysis.

Data Screening

To make sure that the data was ready for the main study analysis, multiple screening steps were followed. First, missing data was checked; however, there was no missing data found since all questions in the surveys were created with a "force responses" tool that Qualtrics provided to control for missing data issues.

Next, unengaged survey takers were assessed by looking at their responses to the attention check question: "If you are paying attention, please select extremely happy". Four respondents selected different answers, which indicated that they were not fully engaged while filling out the survey, and they did not read the questions. For these reasons, those four responses were completely removed from the dataset. Furthermore, to ensure the response variance in the Likert scale items, the researcher identified and removed suspicious response patterns in which the repondent selected the same option in the survey question (i.e. 5,5,5,5,5, 5). The researcher examined the standard deviation score for each Likert scale item in every row in the dataset, and any responses with less than a total of 0.5 standard deviation were removed from the dataset. A total of 11 observations were removed due to the response variance issue. In regard to outliers,

there were no extreme outliers identified in the dataset. Even though the non-normality issue is not a severe issue in PLS-SEM analysis, the researcher examined two measures of distributions, skewness and kurtosis, to make sure that they are between the recommended range of no more than an absolute value of 1 (Hair, Hult, Ringle, & Sarstedt, 2017). The values of skewness and kurtosis of the data ranged from −1.638 to 2.747 and −2.006 to 14.373, respectively. The values of skewness and kurtosis in some of the indicators exceeded the cut-off absolute value of 1, which a violation of data normality (Hair et al., 2017). Therefore, utilizing PLS-SEM was considered an appropriate analysis method for this study.

In addition to data screening procedures, validity and reliability were checked utilizing SmartPLS 3 (Ringle, Wende, & Becker, 2015). The results for the factor analysis revealed that the outer loadings of two indicators related to the conditional value construct were below the recommended loading value and were subjects for further examination. Hair et al. (2017) recommend that an indicator with an outer loading values of ≥ 0.04 but < 0.70 is required to have an analysis of the impact of deleting an indicator on the average variance extracted (AVE) and composite reliability (CR). After deleting conditional_1 (0.161), the AVE and CR increased slightly, so the researcher deleted conditional_3 (0.577) as well. The AVE and CR increased above the recommended level. Table 8 provides more information about the improvement of AVE and CR after deleting the two conditional value indictors.

Table 8: Outcomes of the Item Screening Procedures

Construct	Number of items	Outer loadings	AVE	CR
Conditional values	4	Conditional_1 (0.161) Conditional_3 (0.577)	0.360	0.655
Modification	2	After removing Conditional_1 Conditional_3	0.601	0.751

Demographic Profile

The profile of respondents includes gender, age, marital status, level of education, employments status, and household annual income. The demographic profile of the respondent gender was distributed almost equally between male (50.24%) and female (49.76%) of the total sample. Table 9 shows that female respondents tend to use restaurant kiosk more than do males; on the other hand, male respondents prefer to use restaurant tabletop tablets. Different age categories were presented in the sample, the majority of which were between the ages of 18 and 54 years. The age category the most often associated with a high use of SSTs in the restaurant industry was between 25 and 34 years old (44.43%), followed by the 35 – 44 age group (23.59%). The age groups with the lowest number of representations were 55 – 64, and 65 – 74, (6.14%) and (1.13%), respectively.

The majority of the respondents reported their marital status as never married (46.20%) and married was the second most frequent category with (44.75%). The remaining respondents reported their marital status as separated (2.10%), divorced (5.98%), and widowed (0.97%). Educational background was represented in the sample by different categories. More than half of the respondents reported that they hold a college degree (52.50%), and some college was the second most frequent category with (24.07%). Other educational qualifications were categorized as high school graduate (10.66), Master's degree (11.31%), and Doctoral degree (9%). Almost all respondents were employed full time (69.74%), followed by a 15.53 percent employed in a part time position. Students participant represent 4.37 percent of the total sample. The majority of the participants reported their annual household income of $59,999 or lower (51.45%). The remaining 48.55 percent of the participant reported their annual household income as being in

the higher end income categories. Table 9 provides more details about the demographic profile of respondents.

In addition to the sociodemographic questions, respondents were asked to mention the types of restaurants in which they used SSTs and for which meal time frame, as well as a general question about their general dining out frequencies. The majority of the respondents (55.90%) reported that they used SSTs at a quick service restaurant (QSR) (81.94%). More specifically, the kiosk was the most preferred SST option that customers used in the QSR context, followed by a restaurant website (70.78%), and a mobile app (60%). The tabletop tablet was the least used platform in a QSR; however, it was the leading SST in a casual dining restaurant (70.97%). The use of mobile apps was also common in coffee shop transactions (20.65%). The respondents reported that they mostly used SSTs for their dinner meal (48.95%) and lunch meal (38.45%). Limited SST usages were found during the breakfast meal period (10.50%). In regard to the respondents' dining out frequencies, once a week (44.59%) was the most frequent option, followed by 2 -3 times/week (33.28%), and around 16 percent of the participant dined out more than 4 times a week. Table 10 outlines the types of restaurant and the dining out profile of the participants.

Table 9: Profile of Respondents

Characteristics	Frequency & Percentage (%)			
	Kiosk (n=155)	Tabletop (n=155)	Mobile App (n=155)	Website (n=154)
Gender				
Male	75	82	77	77
	48.39%	52.90%	49.68%	50%
Female	80	73	78	77
	51.61%	47.10%	50.32%	50%
Age				
18 - 24	13	36	21	17
	8.39%	23.23%	13.55%	11.04%
25 - 34	73	53	77	72
	47.10%	34.19%	49.68%	46.75%
35 - 44	43	38	32	33
	27.74%	24.52%	20.65%	21.43%
45 - 54	14	17	20	15
	9.03%	10.97%	12.90	9.74%
55 - 64	10	10	3	15
	6.45%	6.45%	1.94%	9.74%
65 - 74	2	1	2	2
	1.29%	0.65%	1.29%	1.30%
Marital status				
Married or domestic partner	76	71	64	66
	49.03%	45.81%	41.29%	42.86%
Never married	69	71	78	68
	44.52%	45.81%	50.32%	44.16
Divorced	6	7	10	14
	3.87%	4.52%	6.45%	9.09%
Separated	4	5	0	4
	2.58%	3.23%	0%	2.60%
Widowed	0	1	3	2
	0%	0.65%	1.94%	1.30%
Education				
High school graduate	12	19	15	20
	7.74%	12.26%	9.68%	12.99%
Some college but not degree	41	35	37	36
	26.45%	22.58%	23.87%	23.38%
College degree	85	79	83	78
	54.84%	50.97%	53.55%	50.65%
Master's degree	13	22	17	18
	8.39%	14.19%	10.97%	11.69%
Doctoral degree	4	0	3	2
	2.58%	0%	1.94%	1.30%

(continued)

Characteristics	Frequency & Percentage (%)			
	Kiosk (n=155)	Tabletop (n=155)	Mobile App (n=155)	Website (n=154)
Employment status				
Employed full time	114 37.55%	107 69.48%	115 74.19%	95 61.69%
Employed part time	22 14.19%	19 14.19%	22 14.19%	33 21.43%
Student	3 1.94%	13 8.44%	6 3.87%	5 3.25%
Retired	3 1.94%	4 2.60%	1 0.65%	3 1.95%
Unemployed looking for work	8 5.16%	6 3.90%	9 5.81%	12 7.79%
Unemployed not looking for work	5 3.23%	5 3.25%	2 1.29%	6 3.90%
Household income				
Less than $20,000	12 7.74%	16 10.39%	24 15.48%	22 14.29%
$20,000 - $29,999	20 12.90%	21 13.64%	21 13.55%	22 14.29%
$30,000 - $39,999	24 15.48%	20 12.99%	17 10.97%	18 11.69%
$40,000 - $49,999	13 8.39%	20 12.99%	15 9.68%	18 11.69%
$50,000 - $59,999	22 14.19%	24 15.58%	17 10.97%	26 16.88%
$60,000 - $69,999	14 9.03%	9 5.84%	14 9.03%	4 2.60%
$70,000 - $79,999	12 7.74%	11 7.14%	8 5.16%	9 5.84%
$80,000 - $89,999	10 6.45%	9 5.84%	4 2.58%	6 3.90%
$90,000 - $99,999	4 2.58%	2 1.30%	6 3.87%	6 3.90%
$100,000 - $149,999	18 11.61%	15 9.74%	17 10.97%	17 11.04%
More than $150,000	6 3.87%	7 4.55%	12 7.74%	6 3.90%

N= 619

Table 10: Dining Out Profile

Characteristics	Frequency & Percentage (%)			
	Kiosk (n=155)	Tabletop (n=155)	Mobile App (n=155)	Website (n=154)
Types of restaurant				
Quick Service	127 81.94%	17 10.97%	93 60%	109 70.78%
Fast Casual	17 10.97%	21 13.55%	27 17.42%	19 12.34%
Casual Dining	9 5.81%	110 70.97%	3 1.94%	24 15.58%
Coffee Shop	2 1.29%	7 4.52%	32 20.65%	2 1.30%
Meal period/type				
Breakfast	26 16.77%	4 2.58%	32 20.65%	3 1.95%
Lunch	80 51.61%	56 36.13%	60 38.71%	42 27.27%
Dinner	48 30.97%	93 60%	54 34.84%	108 70.13%
Snacks	1 0.65%	2 1.29%	9 5.81%	1 0.65%
Dining out frequency				
Daily	6 3.87%	3 1.94%	11 7.10%	2 1.30%
4-6 times a week	20 12.90%	19 12.26%	26 16.77%	12 7.79%
2-3 times a week	56 36.13%	43 27.74%	57 36.77%	50 32.47%
Once a week	64 41.29%	75 48.39%	48 30.97%	89 57.79%
Other	9 5.81%	15 9.68%	13 8.39%	1 0.65%

PLS-SEM was used to assess the proposed model. The assessment of the PLS-SEM model was based on two systematic evaluation stages suggested by Hair et al. (2017), which includes an evaluation of the measurement model "outer model" and the structural model "inner model". The process begins with an assessment of the measurement model results, then once reliability and validity of the measurement items are established, the next process is to assess the structural model results. Figure 8 outlines the PLS-SEM evaluation procedures.

Measurement Model Assessment (Reflective)		
Internal consistency	Convergent validity	Discriminant validity

Structural Model Assessment				
Coefficients of determination (R^2)	Predictive relevance (Q^2)	Size and significance of path coefficients	f^2 effect sizes	q^2 effect sizes
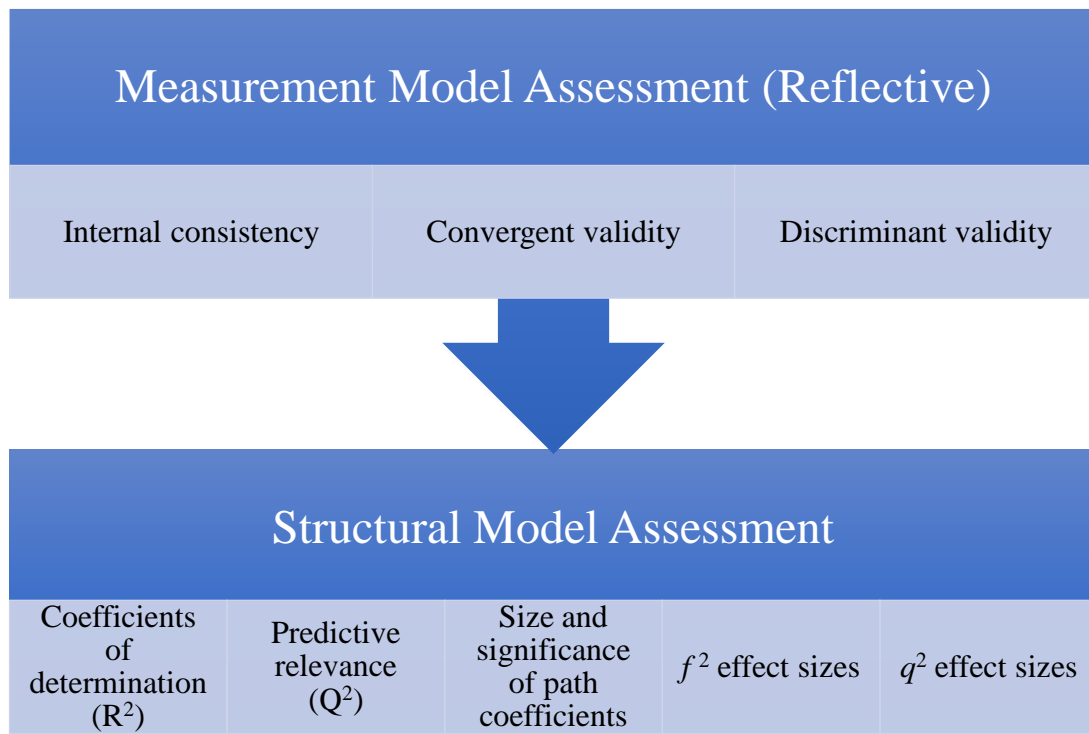
Figure 8 Systematic Procedure for Evaluating the PLS-SEM model

Reflective Measurement Model Assessment

Since this study utilized reflective measurement model to examine the relationship between a set of latent constructs and their indicators, the researcher followed the systematic procedure for evaluating reflective models. The first stage of evaluating the PLS-SEM model results is by examining the internal consistency reliability, convergent validity, and discriminant validity of the main constructs in the study.

Internal Consistency

Composite reliability (CR) is a form of reliability measure used to evaluate the consistency of results across items on the same test (Hair et al., 2017). CR was used to evaluate the internal consistency reliability of the model constructs because it is more appropriate in the PLS-SEM model evaluation since it considers the different outer loadings of the indicator variables (Hair et al., 2017). A CR values between 0.70 and 0.90 are considered to be satisfactory and an indication of a higher level of reliability (Hair et al., 2017). A review of the CR for each construct in the model showed that all values are within the recommended level (CR > 0.70), indicating that internal consistency reliability was reached. Table 11 provides more details about CR for each construct.

Convergent Validity

Convergent validity is defined as "the extent to which a measure correlates positively with alternative measures of the same construct" (Hair et al., 2017, p. 112). Convergent validity was evaluated by examining two measurement values. First, a review of the outer loadings of each indicator showed that all indicators are above the recommended standardized outer loading > 0.708 (Hair et al., 2017). A second measure was used to assess convergent validity, the average

variance extracted (AVE), which is defined as "the degree to which a latent construct explains the variance of its indicators" (Hair et al., 2017, p. 312). A review of the AVE value for each construct showed that all values are above the recommended level (AVE > 0.50), indicating that on average, the construct explains more than half of the variance of its indicators (Bagozzi, Youjae, & Phillips, 1991). Therefore, convergent validity of each construct in the model was established. Table 11 outlines the convergent validity values in detail.

Table 11: Summary of the Reflective Measurement Model Results

Latent variables	Indicators	Convergent Validity		Internal Consistency	Discriminant Validity	
		Outer Loadings	AVE	Composite Reliability (CR)	Fornell-Larcker	HTMT
		> 0.70	> 0.50	> 0.70		**
Functional values	Funct_1	0.818				
	Funct_2	0.775				
	Funct_3	0.857	0.662	0.907	0.814	✓
	Funct_4	0.829				
	Funct_5	0.786				
Emotional values	Emot_1	0.870				
	Emot_2	0.900	0.795	0.940	0.892	✓
	Emot_3	0.883				
	Emot_4	0.914				
Social values	Social_1	0.958				
	Social_2	0.964	0.921	0.972	0.960	✓
	Social_3	0.958				
Epistemic values	Epist_1	0.915				
	Epist_2	0.907	0.813	0.929	0.902	✓
	Epist_3	0.884				
Conditional values	Condi_2	0.779	0.601	0.751	0.775	✓
	Condi_4	0.772				
Interactive Features	Intera_1	0.874	0.797	0.887	0.893	✓
	Intera_2	0.911				
Customization	Custm_1	0.886	0.72	0.837	0.848	✓
	Custm_2	0.809				
Privacy	Priv_1	0.920	0.855	0.922	0.925	✓
	Priv_2	0.929				
Satisfaction with SSTs	SAT_1	0.846				
	SAT_2	0.900	0.755	0.902	0.869	✓
	SAT_3	0.859				
Continuance intention	CONT_1	0.906				
	CONT_2	0.929	0.82	0.932	0.906	✓
	CONT_3	0.881				

** Confidence interval bias corrected does not include 1.

Discriminant Validity

The final step in the measurement model assessment is to examine the constructs discriminant validity. Hair et al. (2017) defined discriminant validity as "the extent to which a construct is truly distinct from other constructs by empirical standards" (p. 115). To assess constructs discriminant validity, two approach are conducted. First, the researcher examined the cross loadings results of each construct and its indicators. All outer loadings on the associated constructs were above any cross loadings on the other constructs, indicating discriminant validity. The second approach to assess discriminant validity is the Fornell-Larcker criterion (Fornell & Larcker, 1981), in which the square root of each construct's AVE values should be greater than its highest correlation to any other construct (Hair et al., 2017). This indicates that the constructs were more strongly related to their respective indicators than to other constructs in the model, and, therefore, discriminant validity was established (Fornell & Larcker, 1981). Table 12 shows the cross loadings results, and Table 13 shows the results of the Fornell-Larcker criterion analysis.

Recently, those two approaches of assessing discriminant validity were criticized for their reliability to detect discriminant validity issues (Henseler, Ringle, & Sarstedt, 2015). The Heterotait-Monotrait Ratio (HTMT) is a new approach proposed by Henseler et al. (2015) to better assess discriminate validity. The HTMT approach is "an estimate of what the true correlation between two constructs would be, if they were perfectly measured" (Hair et al., 2017, p. 118). A true correlation between two constructs close to a value of 1, indicating a lack of discriminant validity (Hair et al., 2017). A review of the HTMT bootstrapping results indicates that all HTMT confidence intervals bias corrected values were below the value of 1, confirming discriminant validity. Table 14 presents the results of the HTMT test.

Table 12: Cross Loadings

	Functional	Emotional	Social	Epistemic	Conditional	Interaction	Customization	Privacy	Satisfaction	CONT intention
Funct_1	0.818	0.729	0.352	0.173	0.448	0.553	0.621	0.522	0.689	0.275
Funct_2	0.775	0.707	0.330	0.182	0.121	0.564	0.643	0.555	0.743	0.280
Funct_3	0.857	0.690	0.319	0.256	0.148	0.527	0.596	0.517	0.688	0.241
Funct_4	0.829	0.690	0.456	0.184	0.192	0.339	0.379	0.305	0.377	0.375
Funct_5	0.786	0.738	0.440	0.125	0.193	0.367	0.436	0.323	0.372	0.388
Emot_1	0.739	0.870	0.434	0.234	0.213	0.624	0.524	0.553	0.748	0.691
Emot_2	0.702	0.900	0.419	0.352	0.250	0.440	0.608	0.449	0.590	0.447
Emot_3	0.698	0.883	0.408	0.321	0.358	0.549	0.663	0.541	0.767	0.711
Emot_4	0.685	0.914	0.376	0.344	0.364	0.503	0.636	0.506	0.723	0.635
Social_1	0.677	0.675	0.958	0.285	0.381	0.606	0.658	0.543	0.734	0.676
Social_2	0.666	0.674	0.964	0.337	0.384	0.546	0.651	0.555	0.731	0.638
Social_3	0.607	0.646	0.958	0.160	0.385	0.363	0.354	0.254	0.362	0.259
Epist_1	0.602	0.590	0.316	0.915	0.411	0.290	0.269	0.182	0.297	0.190
Epist_2	0.596	0.573	0.314	0.907	0.416	0.253	0.273	0.165	0.260	0.137
Epist_3	0.592	0.570	0.287	0.884	0.424	0.490	0.574	0.457	0.602	0.614
Condi_2	0.582	0.559	0.256	0.135	0.779	0.462	0.481	0.415	0.528	0.490
Condi_4	0.519	0.555	0.251	0.163	0.772	0.542	0.596	0.469	0.653	0.665
Intera_1	0.513	0.555	0.245	0.177	0.430	0.874	0.520	0.482	0.561	0.555
Intera_2	0.510	0.539	0.237	0.148	0.445	0.911	0.546	0.447	0.567	0.542
Custm_1	0.493	0.532	0.236	0.322	0.447	0.502	0.886	0.438	0.521	0.496
Custm_2	0.434	0.530	0.224	0.290	0.448	0.512	0.809	0.471	0.615	0.580
Priv_1	0.407	0.412	0.186	0.227	0.460	0.460	0.533	0.920	0.533	0.524
Priv_2	0.405	0.409	0.185	0.194	0.467	0.482	0.566	0.929	0.563	0.560

(continued)

	Functional	Emotional	Social	Epistemic	Conditional	Interaction	Customization	Privacy	Satisfaction	CONT intention
SAT_1	0.268	0.397	0.180	0.203	0.472	0.616	0.719	0.572	0.846	0.736
SAT_2	0.176	0.396	0.167	0.361	0.472	0.547	0.698	0.487	0.900	0.673
SAT_3	0.170	0.395	0.136	0.345	0.488	0.496	0.653	0.479	0.859	0.617
CONT_1	0.124	0.374	0.120	0.370	0.497	0.281	0.358	0.281	0.390	0.906
CONT_2	0.119	0.299	0.106	0.363	0.427	0.279	0.390	0.285	0.410	0.929
CONT_3	0.107	0.260	0.061	0.351	0.429	0.245	0.354	0.270	0.385	0.881

Table 13: Fornell-Larcker Criterion for Discriminant Validity Assessment

	Cond.	CONT.	Custom	Emotional	Epistemic	Functional	Interaction	Privacy	Satisfaction	Social
Cond.	**0.775**									
CONT.	0.492	**0.906**								
Custom	0.525	0.685	**0.848**							
Emotional	0.511	0.747	0.732	**0.892**						
Epistemic	0.200	0.224	0.336	0.361	**0.902**					
Functional	0.543	0.709	0.670	0.722	0.193	**0.814**				
Interaction	0.455	0.606	0.637	0.618	0.341	0.617	**0.893**			
Privacy	0.405	0.587	0.595	0.602	0.227	0.558	0.510	**0.925**		
SAT	0.483	0.781	0.796	0.829	0.345	0.718	0.640	0.593	**0.869**	
Social	0.208	0.277	0.383	0.415	0.377	0.163	0.280	0.291	0.412	**0.960**

Table 14: Heterotait-Monotrait Ratio (HTMT) Results

Constructs	Confidence Intervals Bias Corrected
Functional Values -> Conditional Values	0.017
Functional Values -> Continuance intention	0.001
Functional Values -> Customization	0.002
Functional Values -> Emotional Values	-0.001
Functional Values -> Epistemic Values	0.000
Emotional Values -> Conditional Values	0.016
Emotional Values -> Continuance intention	0.001
Emotional Values -> Customization	0.002
Social Values -> Conditional Values	0.007
Social Values -> Continuance intention	0.000
Social Values -> Customization	0.001
Social Values -> Emotional Values	0.001
Social Values -> Epistemic Values	0.000
Social Values -> Functional Values	0.002
Social Values -> Interactive Features	0.000
Social Values -> Privacy	0.000
Social Values -> Satisfaction with SST	0.000
Epistemic Values -> Conditional Values	0.010
Epistemic Values -> Continuance intention	0.001
Epistemic Values -> Customization	0.001
Epistemic Values -> Emotional Values	0.000
Customization -> Conditional Values	0.023
Customization -> Continuance intention	0.002
Interactive Features -> Conditional Values	0.018
Interactive Features -> Continuance intention	0.001
Interactive Features -> Customization	0.003
Interactive Features -> Emotional Values	0.000
Interactive Features -> Epistemic Values	0.001
Interactive Features -> Functional Values	0.000
Privacy -> Conditional Values	0.013
Privacy -> Continuance intention	0.001
Privacy -> Customization	0.001
Privacy -> Emotional Values	0.000
Privacy -> Epistemic Values	0.000
Privacy -> Functional Values	0.000
Privacy -> Interactive Features	0.001

(continued)

Constructs	Confidence Intervals Bias Corrected
Satisfaction with SST -> Conditional Values	0.016
Satisfaction with SST -> Continuance intention	0.000
Satisfaction with SST -> Customization	0.003
Satisfaction with SST -> Emotional Values	0.000
Satisfaction with SST -> Epistemic Values	0.000
Satisfaction with SST -> Functional Values	0.000
Satisfaction with SST -> Interactive Features	0.000
Satisfaction with SST -> Privacy	0.000
Continuance intention -> Conditional Values	0.017

Structural Model Evaluation

After examining the results of the measurement model, this section assesses the results of the structural model, the "outer model", following the six steps outlined by Hair et al. (2017) and illustrated in Figure 9. The theoretical assessment of the structural model helps the researcher to examine the proposed hypothesized relationships and to discover how well the model fits.

Multicollinerity

Significance and relevance of the structural model relationships

The level of R^2

The f^2 effect size

Predective relevance Q^2

The q^2 effect size
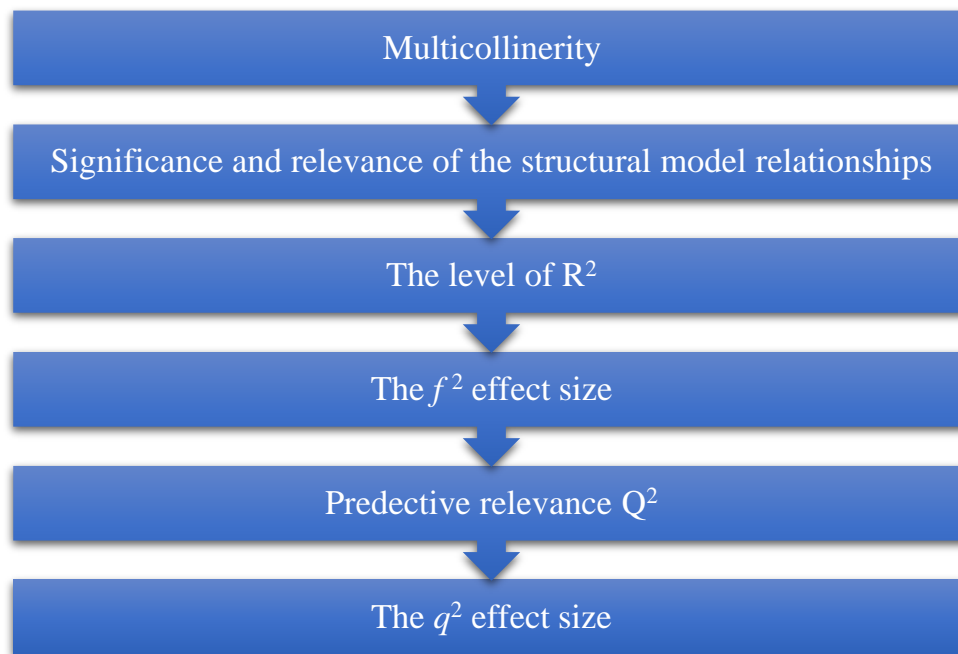
Figure 9: The Six Steps for Structural Model Assessment

Multicollinearity Assessment

The first step in the structural model assessment procedure is to examine the level of the Variance Inflation Factor (VIF) in each set of predictor constructs. A VIF higher than five in any indicator is considered to be critical, which is then required to be removed from the corresponding indicator (Hair et al., 2017). A review of the VIF values revealed that only one indicator related to the social value construct Social_2 exceeded the VIF critical level > 5. Therefore, the indicator Social_1 was removed from the model in order to proceed with the structural model assessment.

Structural Model Patch Coefficient

The second step in the assessment procedure for the PLS-SEM structural model is to examine the significance level of hypothesized relationships among the constructs. To do this, a bootstrapping procedure with 5,000 subsamples was performed using SmartPLS 3. The results from the bootstrapping analysis shows that the all the hypothesized relationships, except three path coefficients, were at significant levels (α= 0.01 and α=0.05). The relationship between epistemic values and satisfaction with SST (t= 0.544; α > 0.05), conditional values and satisfaction with SST (t= 1.580; α > 0.05), and privacy and satisfaction with SST (t= 0.829; α > 0.05) were not found to be significant. Table 15 outlines all path relationships and significance results.

Table 15: Significance Testing Results of the Structural Model Path Coefficients

Relationships	Path Coefficient	t-Values	p-Values	95% Confidence Intervals	Significant levels	Results
H1. Functional Values -> Satisfaction SST	0.161	4.321	0.000	[0.088, 0.234]	***	Supported
H2. Emotional Values -> Satisfaction SST	0.409	10.456	0.000	[0.336, 0.486]	***	Supported
H3. Social Values -> Satisfaction SST	0.070	2.855	0.004	[0.024, 0.117]	**	Supported
H4. Epistemic Values -> Satisfaction SST	0.013	0.544	0.586	[-0.032, 0.060]	NS	Not supported
H5. Conditional Values -> Satisfaction SST	-0.040	1.580	0.114	[-0.090, 0.010]	NS	Not supported
H6 Interactive Features -> Satisfaction SST	0.062	2.154	0.031	[0.003, 0.118]	*	Supported
H7. Customization -> Satisfaction with SST	0.324	9.021	0.000	[0.257, 0.396]	***	Supported
H8. Privacy -> Satisfaction SST	0.025	0.829	0.407	[-0.033, 0.086]	NS	Not supported
H9. Satisfaction SST -> Continuance intention	0.781	32.669	0.000	[0.726, 0.820]	***	Supported
R^2						
Satisfaction with SST = 0.781						
Continuance intention = 0.610						

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, NS= Not Significant

Coefficient of Determination (R^2 value)

The third step in the evaluation of the structural model is the assessment of the coefficient of determination (R^2 value). This coefficient is a "measure of the model's predictive power and is calculated as the secured correlation between a specific endogenous construct's actual and predictive values" (Hair et al., 2017, p. 198). R^2 values of 0.75, 0.50, or 0.25 for an endogenous latent construct can be respectively described as substantial, moderate, or weak (Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009). A review of the R^2 values revealed that coefficients for the model are substantial for satisfaction with SST (0.781), and moderate for continuance intention (0.610).

The Effect Size f^2

The next step in the PLS-SEM structural model assessment procedure is to examine the effect size (f^2). By examining the effect size, the researcher can interpret the meaning of the observed results and answering the so what question (Ellis, 2010). The f^2 allows the researcher to know the effect size of the exogenous constructs on the endogenous latent constructs (Hair et al., 2017). The f^2 recommended assessment guidelines are that values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects of the exogenous latent construct (Cohen, 1988; Ellis, 2010; Hair et al., 2017). A review of the f^2 effect size values shows that satisfaction with SST has a large effect size in the continuance intention (1.565), and above the medium effect size guidelines were found in emotional value on satisfaction with SST (0.237), and customization on satisfaction with SST (0.172). Table 16 outlines the effect size values and levels.

Table 16: Effect Size f^2 Results of the Structural Model Path Coefficients

Relationships	Path Coefficient	f^2 effect size	Effect size levels
Functional Values -> Satisfaction SST	0.161	0.042	Small
Emotional Values -> Satisfaction SST	0.409	0.237	Medium
Social Values -> Satisfaction SST	0.070	0.016	NE
Epistemic Values -> Satisfaction SST	0.013	0.001	NE
Conditional Values -> Satisfaction SST	-0.040	0.005	NE
Interactive Features -> Satisfaction SST	0.062	0.009	NE
Customization -> Satisfaction with SST	0.324	0.172	Small
Privacy -> Satisfaction SST	0.025	0.002	NE
Satisfaction SST -> Continuance intention	0.781	1.565	Large

Notes: NE= No effect

Blindfolding and Predictive Relevance Q^2

The Q^2 measure is an "indicator of the model out-of-sample power or predictive relevance" (Hair et al., 2017, p. 202). Using the SmartPLS 3, a blindfolding procedure was performed on all endogenous constructs in the path model with an omission distance of D=12. The results showed that the cross-validated redundancy measures Q^2 values are considerably above zero (i.e. satisfaction with SST $Q^2 = 0.574$, continuance intention $Q^2 = 0.490$). This results provides clear support for the model's predictive relevance regarding the endogenous latent constructs (Hair et al., 2017).

Effect Size of q^2

The final step in assessing the structural model is examining the effect size of $q2$. A value of 0.02, 0.15, and 0.35, respectively, indicate that the exogenous construct has a small, medium, or large predictive relevance for a certain endogenous construct (Hair et al., 2017). The value of

q_2 was calculated manually, and a medium q_2 effect size was found in the outcome relationship satisfaction with SST on continuance intention (0.122).

Multi-Group Analysis (PLS-MGA)

In order to examine the hypothesized moderation relationships for the types of SSTs, the PLS-MGA procedure was performed. The PLS-MGA test approach "compares each bootstrap estimate of one group with all other bootstrap estimates of the same parameter in the other group" (Hair et al., 2017, p. 294). This method is a non-parametric significance test which allows the researcher to explore the difference of group-specific results that build on PLS-SEM bootstrapping results (Ringle et al., 2015). According to Hair et al. (2017) the PLS-MGA allows the researcher to examine the differences between an identical model estimated for different groups/ subsamples (i.e., kiosk, tabletop, mobile app, and website). This approach offers "a more complete picture on the moderator's influence on the analysis results as the focus shifts from examining its impact on one specific model relationship to examining its impact on all model relationships" (Hair et al., 2017, p. 246). The PLS-MAG result is significant at the 5% probability of error level if the p-value is smaller than 0.05 or larger than 0.95 for a certain difference of group-specific path coefficients (Hair et al., 2017; Ringle et al., 2015; Sarstedt, Henseler, & Ringle, 2011). A combination of six comparisons were conducted to examine the path relationship across the four SST groups as outlined in Table 17.

Table 17: PLS-MGA SST Groups Comparison Combinations

	Kiosk	Tabletop	Mobile app	Website
Kiosk				
Tabletop	$p^{(kiosk)} - p^{(tabletop)}$			
Mobile app	$p^{(kiosk)} - p^{(mobile\ app)}$	$p^{(tabletop)} - p^{(mobile\ app)}$		
Website	$p^{(kiosk)} - p^{(website)}$	$p^{(tabletop)} - p^{(website)}$	$p^{(mobile\ app)} - p^{(website)}$	

Before conducting the PLS-MGA between two or more groups when using PLS-SEM, the measurement invariance of composites (MICOM) procedures must be established by examining (1) configural invariance, (2) compositional invariance, and (3) equality of composite mean values and variances (Hair et al., 2017). It is believed that by establishing the three steps of MICOM before performing the PLS-MGA, the researcher can be confident that any finding related to group difference in the model estimation is not due the distinctive content and/or meanings of the latent constructs across groups (Hair et al., 2017).

In the first step of the MICOM procedure, configural invariance was established because the PLS path model setups are equal across the four types of SST, and the group-specific model estimations draw on identical algorithm settings. The second step is to establish compositional invariance. The original composite score correlation (c) was compared with the empirical distribution of the composite score correlation resulting from the permutation procedure (c_u) with 1000 permutations and a 5% significance level for each combination of the types of SST (Hair et al., 2017). A review of the c value across all the four groups shows that no values exceeds the 5% quantile value of c_u; as a result, compositional invariance is established. Table 18 outlines the results of the MICOM analysis procedures, which shows that partial measurement invariance is established among all four types of SST, allowing for the PLS-MGA analysis that compares the path coefficients among the samples from these four types of SSTs to identify if there are

significant differences across the groups. The third step in the MICOM procedure (equality of the composite mean values and variances) is not examined because the purpose of this study is to focus on the cross comparisons of the four types of SSTs and not to aggregate the data (Hair et al., 2017). Next, the data was split up into four groups related to each type of SST. Then, a bootstrapping analysis using 5,000 subsamples was performed on each group to examine the hypothesized path relationships for each SST sample. Table 19 lists results of the beta coefficients for the four types of SST, along with the R^2 value for each endogenous construct. A review of the four types of SST path models revealed that all models demonstrate large to moderate explanatory power since the R^2 values range from 0.837 to 0.406 (Hair et al., 2017; Hair et al., 2011; Henseler et al., 2009).

Table 20 presents the results of PLS-MGA, which shows the differences in the ten hypothesized path coefficients across the four types of SST and presents the results of the multi-group analysis comparison. The results from comparing kiosk vs. mobile app revealed that the relationship between privacy features and satisfaction with SSTs is significantly ($p > 0.95$) indicating that the importance of privacy features in the mobile apps is different ($p^{(1)} = 0.142$) than in a restaurant kiosk ($p^{(2)} = -0.041$). This means that privacy features are very important to restaurant mobile app users, more than in restaurant kiosk users. Furthermore, the results indicate that the relationship between customer satisfaction with SSTs and continuance intention is significantly ($p < 0.05$) different in restaurant kiosk ($p^{(1)} = 0.847$) than in restaurant mobile app ($p^{(2)} = 0.740$). These results indicate that restaurant customers are more satisfied with using restaurant mobile apps than a restaurant kiosk. Next, the comparison of kiosk vs. website shows that the relationship between customer satisfaction with SSTs and continuance intention is significantly ($p < 0.05$) different in a restaurant kiosk ($p^{(1)} = 0.847$) than in a restaurant website

$(p^{(2)} = 0.641)$. These results reveled that customer satisfaction with a restaurant kiosk is higher

than it is for a restaurant website. Finally, the results of comparing tabletop vs. website revealed

that the relationship between satisfaction with SSTs and continuance intention is significantly (p

< 0.05) different in the restaurant tabletop ($p^{(1)} = 0.832$) than in a restaurant website ($p^{(2)} =$

0.641). These results indicate that restaurant customers who used tabletop are more satisfied with

their experience than those who used a restaurant website.

Table 18: Measurement Invariance of Composite Models (MICOM) Assessment

Variable	Kiosk vs. Tabletop		Kiosk vs. Mobile App		Kiosk vs. Website		Tabletop vs. Mobile App		Tabletop vs. Website		Mobile App vs. Website	
	c	5% Quintile of c_u	c	5% Quintile of c_u	c	5% Quintile of c_u	c	5% Quintile of c_u	c	5% Quintile of c_u	c	5% Quintile of c_u
Functional Values	0.999	0.997	0.984	0.942	0.978	0.917	0.993	0.972	0.992	0.969	0.989	0.960
Emotional Values	1.000	1.000	1.000	0.999	1.000	0.999	1.000	0.999	1.000	0.999	0.999	0.997
Social Values	1.000	1.000	0.999	0.996	0.998	0.994	0.999	0.997	0.999	0.995	0.999	0.995
Epistemic Values	0.999	0.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999
Conditional Values	0.987	0.954	0.998	0.995	0.997	0.991	0.998	0.994	0.996	0.985	0.997	0.992
Interactive Features	0.999	0.995	0.999	0.997	0.999	0.997	0.999	0.998	0.999	0.998	0.999	0.998
Customization	0.999	0.996	0.999	0.996	0.999	0.997	0.999	0.995	0.999	0.995	0.999	0.997
Privacy	0.999	0.998	0.999	0.998	0.999	0.997	1.000	0.999	1.000	0.999	1.000	0.999
Satisfaction with SST	1.000	1.000	1.000	0.999	1.000	0.999	1.000	1.000	1.000	0.999	0.999	0.998
Continuance intention	1.000	1.000	1.000	0.999	1.000	0.999	1.000	0.999	1.000	0.999	0.999	0.998

Notes: if c < 5% quantile of c_u, compositional invariance requirements are violated.

Table 19: Bootstrapping Results for SST Types Specific Structural Models

Path relationships	Kiosk	Tabletop	Mobile App	Website
Functional Values -> Satisfaction SST				
Path coefficient	0.165	0.124	0.211	0.176
t-values	3.067	1.617	2.584	1.623
Significant level	**	NS	*	NS
p-values	0.002	0.106	0.010	0.105
Confidence intervals	[0.064, 0.279]	[-0.011, 0.287]	[0.042, 0.363]	[-0.052, 0.373]
Emotional Values -> Satisfaction SST				
Path coefficient	0.477	0.485	0.350	0.324
t-values	6.834	6.357	3.741	3.802
Significant level	***	***	***	***
p-values	0.000	0.000	0.000	0.000
Confidence intervals	[0.347, 0.625]	[0.343, 0.642]	[0.163, 0.535]	[0.158, 0.492]
Social Values -> Satisfaction SST				
Path coefficient	0.056	0.019	0.047	0.114
t-values	1.504	0.366	0.839	2.166
Significant level	NS	NS	NS	*
p-values	0.133	0.714	0.401	0.030
Confidence intervals	[-0.017, 0.130]	[-0.087, 0.121]	[-0.065, 0.155]	[0.012, 0.223]
Epistemic Values -> Satisfaction SST				
Path coefficient	0.021	-0.019	0.004	0.045
t-values	0.423	0.490	0.081	0.839
Significant level	NS	NS	NS	NS
p-values	0.672	0.624	0.935	0.401
Confidence intervals	[-0.070, 0.120]	[-0.094, 0.057]	[-0.091, 0.096]	[-0.056, 0.154]

Notes: *p < 0.05; **p < 0.01; ***p < 0.001, NS= Not Significant *(continued)*

Path relationships	Kiosk	Tabletop	Mobile App	Website
Conditional Values -> Satisfaction SST				
Path coefficient	-0.015	-0.010	-0.045	-0.068
t-values	0.354	0.253	0.719	1.131
Significant level	NS	NS	NS	NS
p-values	0.723	0.801	0.472	0.258
Confidence intervals	[-0.116, 0.058]	[-0.090, 0.073]	[-0.165, 0.083]	[-0.183, 0.052]
Interactive Features -> Satisfaction SST				
Path coefficient	0.081	0.032	0.043	0.089
t-values	1.381	0.564	0.683	1.288
Significant level	NS	NS	NS	NS
p-values	0.167	0.573	0.495	0.198
Confidence intervals	[-0.031, 0.201]	[-0.082, 0.146]	[-0.082, 0.164]	[-0.040, 0.227]
Customization -> Satisfaction with SST				
Path coefficient	0.316	0.380	0.247	0.294
t-values	4.973	4.921	2.971	3.404
Significant level	***	***	**	**
p-values	0.000	0.000	0.003	0.001
Confidence intervals	[0.198, 0.449]	[0.230, 0.527]	[0.087, 0.414]	[0.122, 0.456]

Notes: $*p < 0.05$; $**p < 0.01$; $***p < 0.001$, NS= Not Significant

(continued)

Path relationships	Kiosk	Tabletop	Mobile App	Website
Privacy -> Satisfaction SST				
Path coefficient	-0.041	-0.030	0.142	0.079
t-values	0.816	0.499	2.021	1.174
Significant levels	NS	NS	*	NS
p-values	0.414	0.618	0.043	0.241
Confidence intervals	[-0.134, 0.064]	[-0.143, 0.083]	[0.012, 0.288]	[-0.051, 0.213]
Satisfaction SST -> Continuance intention				
Path coefficient	0.847	0.832	0.740	0.641
t-values	27.974	23.424	21.122	8.627
Significant levels	***	***	***	***
p-values	0.000	0.000	0.000	0.000
Confidence intervals	[0.777, 0.895]	[0.750, 0.888]	[0.658, 0.798]	[0.469, 0.758]
R^2				
Satisfaction with SST	0.837	0.818	0.737	0.661
Continuance intention	0.715	0.691	0.544	0.406

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, NS= Not Significant

Table 20: PLS-MGA Comparison Test Results

Relationships	Kiosk vs. Tabletop		Kiosk vs. Mobile App		Kiosk vs. Website		Tabletop vs. Mobile App		Tabletop vs. Website		Mobile App vs. Website	
	diff	p-value	diff	p-value	diff	p-value	diff	p-value	diff	p-value	diff	p-value
Functional Values -> Satisfaction SST	0.041	0.319	0.046	0.681	0.011	0.542	0.087	0.785	0.053	0.659	0.035	0.403
Emotional Values -> Satisfaction SST	0.008	0.533	0.126	0.142	0.153	0.079	0.134	0.133	0.161	0.081	0.027	0.412
Social Values -> Satisfaction SST	0.037	0.277	0.009	0.444	0.058	0.814	0.028	0.641	0.095	0.902	0.067	0.806
Epistemic Values -> Satisfaction SST	0.040	0.264	0.017	0.404	0.024	0.632	0.023	0.644	0.064	0.836	0.041	0.713
Conditional Values -> Satisfaction SST	0.005	0.535	0.030	0.348	0.053	0.232	0.035	0.321	0.058	0.210	0.023	0.389
Interactive Features -> Satisfaction SST	0.049	0.273	0.038	0.326	0.008	0.535	0.010	0.548	0.057	0.739	0.047	0.694
Customization -> Satisfaction with SST	0.064	0.744	0.069	0.257	0.022	0.424	0.133	0.121	0.086	0.227	0.047	0.653
Privacy -> Satisfaction SST	0.012	0.560	0.184	0.984[*]	0.121	0.922	0.172	0.972	0.109	0.887	0.063	0.258
Satisfaction SST -> Continuance intention	0.014	0.384	0.107	0.011[**]	0.206	0.001[***]	0.093	0.035	0.192	0.004[**]	0.099	0.112

Notes: *p < 0.05; **p < 0.01; ***p < 0.001.

Hypotheses Testing

The results of the structural model show the influence of SST value factors on restaurant customers' satisfaction with the use of an SST in their dining experience and their intention to reuse the SST in any future dining experience. The impact of eight factors related to the SST values were examined on the two outcome constructs. As discussed in the second chapter of this dissertation, a total of 45 hypotheses were proposed that outline the relationships between SSTs and satisfaction and continuance intention across four types of SST in the restaurant industry. The result for each hypothesis is presented in Table 21. Appendix A presents the path model results for the hypothesized relationships.

Table 21: Summary of Study Hypotheses Results

	General Hypotheses	Finding
H1.	Functional values will have a positive impact on customer satisfaction with SST.	Supported
H2.	Emotional values will have a positive impact on customer satisfaction with SST.	Supported
H3.	Social values will have a positive impact on customer satisfaction with SST.	Supported
H4.	Epistemic values will have a positive impact on customer satisfaction with SST.	Not supported
H5.	Conditional values will have a positive impact on customer satisfaction with SST.	Not supported
H6.	The interaction features available in SST will have a positive impact on customer satisfaction with SST.	Supported
H7.	The customization features available in SST will have a positive impact on customer satisfaction with SST.	Supported
H8.	The privacy features available in SST will have a positive impact on customer satisfaction with SST.	Not supported
H9.	Customer satisfaction with SST will have a positive impact on customer continuance intention towards SST in the restaurant context	Supported

(continued)

	Kiosk Hypotheses	Finding
H10$_a$.	The influences of functional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Supported
H10$_b$.	The influences of emotional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Supported
H10$_c$.	The influences of social values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Not Supported
H10$_d$.	The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Not Supported
H10$_e$.	The influences of conditional values on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Not Supported
H10$_f$.	The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Not Supported
H10$_g$.	The influences customization features on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Supported
H10$_h$.	The influences of privacy features on customer satisfaction with SSTs will be different for restaurant kiosk than the other SST types.	Not Supported
H10$_i$.	Customer satisfaction with SSTs will have a positive impact on customer continuance intention towards restaurant kiosk.	Supported

(continued)

	Tabletop Hypotheses	Finding
H11$_a$.	The influences of functional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_b$.	The influences of emotional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Supported
H11$_c$.	The influences of social values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_d$.	The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_e$.	The influences of conditional values on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_f$.	The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_g$.	The influences customization features on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Supported
H11$_h$.	The influences of privacy features on customer satisfaction with SSTs will be different for restaurant tabletop than the other SST types.	Not Supported
H11$_i$.	Customer satisfaction with SSTs will have a positive impact on customer continuance intention towards restaurant tabletop.	Supported

(continued)

	Mobile App Hypotheses	Finding
H12$_a$.	The influences of functional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Supported
H12$_b$.	The influences of emotional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Supported
H12$_c$.	The influences of social values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Not Supported
H12$_d$.	The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Not Supported
H12$_e$.	The influences of conditional values on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Not Supported
H12$_f$.	The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Not Supported
H12$_g$.	The influences customization features on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Supported
H12$_h$.	The influences of privacy features on customer satisfaction with SSTs will be different for restaurant branded mobile app than the other SST types.	Supported
H12$_i$.	Customer satisfaction with SSTs will have a positive impact on customer continuance intention towards restaurant branded mobile app.	Supported

(continued)

Website Hypotheses		Finding
H13$_a$.	The influences of functional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Not Supported
H13$_b$.	The influences of emotional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Supported
H13$_c$.	The influences of social values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Supported
H13$_d$.	The influences of epistemic values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Not Supported
H13$_e$.	The influences of conditional values on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Not Supported
H13$_f$.	The influences of the interactive features on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Not Supported
H13$_g$.	The influences customization features on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Supported
H13$_h$.	The influences of privacy features on customer satisfaction with SSTs will be different for restaurant website than the other SST types.	Not Supported
H13$_i$.	Customer satisfaction with SSTs will have a positive impact on customer continuance intention towards restaurant website.	Supported

Hypothesis 1 stated that functional values of SST positively impacts customer satisfaction with SST. The path coefficient between this hypothesized relationship was statistically significant, indicating that functional values do have an influence on customer satisfaction with SST experience (t-value = 4.321, p < 0.001). Thus, this result supports Hypothesis 1. This finding is similar to previous study findings in a similar context (Kaushik & Rahman, 2017; Rosengren & Prebensen, 2016).

Hypothesis 2 stated that the emotional values of SST positively impacts customer satisfaction with SST. The path coefficient between this hypothesized relationship was statistically significant, indicating that emotional values do have an influence on customer satisfaction with an SST experience (t-value = 10.456, p < 0.001). Thus, this result supports Hypothesis 2. This finding is similar to previous study findings in similar context (Ahn & Seo, 2018).

Hypothesis 3 stated that social values of SST positively impact customer satisfaction. The path coefficient between this hypothesized relationship was statistically significant, indicating that social values do have an influence on customer satisfaction with SST experience (t-value = 2.855, p < 0.05). Thus, this result supports Hypothesis 3. This finding is similar to previous study findings in the consumer behavior literature (Pihlström & Brush, 2008).

Hypothesis 4 stated that epistemic values of SST positively impact customer satisfaction. The path coefficient between this hypothesized relationship was not statistically significant, indicating that epistemic values of SST do not have any influence on customer satisfaction with SST experience (t-value = 0.544, p > 0.05). Thus, this result does not support Hypothesis 4. A previous study found that epistemic values do have an influence on consumer satisfaction and loyalty; however, the finding was in the retail context (Pura, 2005).

Hypothesis 5 stated that conditional values of SST positively impacts customer satisfaction. The path coefficient between this hypothesized relationship was not statistically significant, indicating that conditional values of SST do not have any influence on customer satisfaction with SST experience (t-value = 1.580, p > 0.05). Thus, this result does not support Hypothesis 5. This finding is interesting since previous studies found that some factors related to conditional value (i.e. waiting time) do have an influence on customer satisfaction; however, it was in a supermarket context (Orel & Kara, 2014).

Hypothesis 6 stated that interactive features available in a SST positively impact customer satisfaction. The path coefficient between this hypothesized relationship was statistically significant, indicating that interactive features do have an influence on customer satisfaction with SST experience (t-value =2.154, p < 0.05). Thus, this result supports Hypothesis 6. This finding is similar to previous study findings in a similar context (Scharlr, Wöber, & Bauer, 2003).

Hypothesis 7 stated that the customization features available in an SST positively impact customer satisfaction. The path coefficient between this hypothesized relationship was statistically significant, indicating that customization features do have an influence on customer satisfaction with an SST experience (t-value =2.154, p < 0.05). Thus, this result supports Hypothesis 7. This finding is similar to previous study findings in a similar context (Lin & Hsieh, 2011).

Hypothesis 8 stated that privacy features in an SST positively impact customer satisfaction. The path coefficient between this hypothesized relationship was not statistically significant, indicating that privacy features of SST do not have any influence on customer satisfaction with SST experience (t-value = 0.829, p > 0.05). Thus, this result does not support

Hypothesis 8. This finding is interesting as a recent previous study found that privacy and security features in SST do have an influence on customer satisfaction (Susskind & Curry, 2016).

Hypothesis 9 stated that customer satisfaction with an SST positively impacts customer continuance intention. The path coefficient between this hypothesized relationship was statistically significant, indicating that customer satisfaction with the SST experience has a positive influence on restaurant customer continuance intention toward SSTs (t-value = 32.669, p < 0.001). Thus, this result supports Hypothesis 9, which is in accordance with previous study findings (Shang & Wu, 2017).

Kiosk Results

Hypothesis 10_a tested the influence of functional values on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was statistically significant, indicating that functional values do have an influence on customer satisfaction with a restaurant kiosk (t-value = 3.067, p < 0.01). Thus, this result supports Hypothesis 10_a.

Hypothesis 10_b tested the influence of emotional values on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was statistically significant, indicating that emotional values do have an influence on customer satisfaction with a restaurant kiosk (t-value = 6.834, p < 0.001). Thus, this result supports Hypothesis 10_b.

Hypothesis 10_c tested the influence of social values on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was not statistically significant, indicating that social values of SST do not have any influence on customer satisfaction with a restaurant kiosk (t-value = 1.504, p > 0.10). Thus, this result does not support Hypothesis 10_c.

Hypothesis 10_d tested the influence of epistemic values on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was not statistically significant, indicating that epistemic values of SST do not have any influence on customer satisfaction with a restaurant kiosk (t-value = 0.423, p > 0.10). Thus, this result does not support Hypothesis 10_d. This finding is similar to all types of SSTs included in this study.

Hypothesis 10_e tested the influence of conditional values on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was not statistically significant, indicating that conditional values of SST do not have any influence on customer satisfaction with a restaurant kiosk (t-value = 0.354, p > 0.10). Thus, this result does not support Hypothesis 10_e. In a similar context, previous research found that situational factors such as wait time due to long lines do have an influence on customer intention to use an SST, and eventually, does have an impact on customer satisfaction with the SSTs usage experience (Kokkinou & Cranage, 2013, 2015).

Hypothesis 10_f. tested the influence of interactive features on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was not statistically significant, indicating that interactive features in a restaurant kiosk do not have any influence on customer satisfaction with a restaurant kiosk (t-value = 1.381, p > 0.10). Thus, this result does not support Hypothesis 10_f. This finding was expected because customer interaction with a restaurant kiosk is limited in time since it is designed for order placement and payment in QSR settings.

Hypothesis 10_g. tested the influence of customization features on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was statistically significant, indicating that customization features in a restaurant kiosk do have an

influence on customer satisfaction with a restaurant kiosk (t-value = 4.973, p < 0.001). Thus, this result supports Hypothesis 10_g. This finding is similar to previous study findings in a similar context since order customization is a key feature in the restaurant kiosk system that provides the customer with the ability to co-create an order (Kim et al., 2013).

Hypothesis 10_h. tested the influence of privacy features on customer satisfaction with a restaurant kiosk. The path coefficient between this hypothesized relationship was not statistically significant, indicating that privacy features in a restaurant kiosk do not have any influence on customer satisfaction with a restaurant kiosk (t-value = 0.816, p > 0.10). Thus, this result does not support Hypothesis 10_h. This finding is interesting because it was expected that privacy features influence a customer to use a restaurant kiosk and thus enhance customer satisfaction with the kiosk experience.

Hypothesis 10_i. stated that customer satisfaction with a restaurant kiosk positively impacts the customer continuance intention to use the restaurant kiosk. The path coefficient between this hypothesized relationship was statistically significant, indicating that customer satisfaction with a restaurant kiosk does have an influence on customer continuance intention of a restaurant kiosk (t-value = 27.974, p < 0.001). Thus, this result supports Hypothesis 10_i.

Tabletop Results

Hypothesis 11_a tested the influence of functional values on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that functional values do not have an influence on customer satisfaction with a restaurant tabletop (t-value = 1.617, p > 0.10). Thus, this result does not support Hypothesis 11_a. This finding is interesting because functional values were expected to deliver a satisfactory tabletop tablet experience; however, this result represents the limitation of

the currently implemented tabletop in a large number of restaurants around the country. For that, a restaurateur should enhance their tabletop SST by providing more functional features such as being able to order from the full menu and being able to request special services.

Hypothesis 11_b tested the influence of emotional values on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was statistically significant, indicating that emotional values do have an influence on customer satisfaction with a restaurant tabletop (t-value = 6.357, $p < 0.001$). Thus, this result supports Hypothesis 11_b.

Hypothesis 11_c tested the influence of social values on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that social values of SST do not have any influence on customer satisfaction with a restaurant tabletop (t-value = 0.366, $p > 0.10$). Thus, this result does not support Hypothesis 11_c.

Hypothesis 11_d tested the influence of epistemic values on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that epistemic values of SST do not have any influence on customer satisfaction with a restaurant tabletop (t-value = 0.490, $p > 0.10$). Thus, this result does not support Hypothesis 11_d. in this context. However, a previous study which was conducted qualitatively by interviewing participants in a similar setting found a positive relationship between novelty values and the dining experience (Chen, Lin, & Yen, 2011).

Hypothesis 11_e tested the influence of conditional values on customer satisfaction with the restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that conditional values of SST do not have any influence on

customer satisfaction with a restaurant tabletop (t-value = 0.253, p > 0.10). Thus, this result does not support Hypothesis 11_e.

Hypothesis 11_f. tested the influence of interactive features on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that interactive features in a restaurant tabletop do not have any influence on customer satisfaction with a restaurant tabletop experience (t-value = 0.564, p > 0.10). Thus, this result does not support Hypothesis 11_f.

Hypothesis 11_g. tested the influence of features on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was statistically significant, indicating that customization features in a restaurant tabletop do have an influence on customer satisfaction with a restaurant tabletop (t-value = 4.921, p < 0.001). Thus, this result supports Hypothesis 11_g.

Hypothesis 11_h. tested the influence of privacy features on customer satisfaction with a restaurant tabletop. The path coefficient between this hypothesized relationship was not statistically significant, indicating that privacy features in restaurant tabletop do not have any influence on customer satisfaction with a restaurant tabletop (t-value = 0.499, p > 0.10). Thus, this result does not support Hypothesis 11_h.

Hypothesis 11_i. stated that customer satisfaction with a restaurant tabletop positively impacts the customer continuance intention of using restaurant tabletop. The path coefficient between this hypothesized relationship was statistically significant, indicating that customer satisfaction with a restaurant tabletop does have an influence on customer continuance intention of a restaurant tabletop (t-value = 23.424, p < 0.001). Thus, this result supports Hypothesis 11_i.

Mobile Apps Results

Hypothesis 12_a tested the influence of functional values on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was statistically significant, indicating that functional values do have an influence on customer satisfaction with a restaurant branded mobile app (t-value = 2.584, p < 0.01). Thus, this result supports Hypothesis 12_a.

Hypothesis 12_b tested the influence of emotional values on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was statistically significant, indicating that emotional values do have an influence on customer satisfaction with a restaurant branded mobile app (t-value = 3.741, p < 0.001). Thus, this result supports Hypothesis 12_b.

Hypothesis 12_c tested the influence of social values on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was not statistically significant, indicating that social values do not have any influence on customer satisfaction with a restaurant branded mobile app (t-value = 0.839, p > 0.10). Thus, this result does not support Hypothesis 12_c.

Hypothesis 12_d tested the influence of epistemic values on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was not statistically significant, indicating that epistemic values do not have any influence on customer satisfaction with a restaurant branded mobile app (t-value = 0.081, p > 0.10). Thus, this result does not support Hypothesis 12_d.

Hypothesis 12_e tested the influence of conditional values on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was

not statistically significant, indicating that conditional values do not have any influence on customer satisfaction with a restaurant branded mobile app (t-value = 0.719, p > 0.10). Thus, this result does not support Hypothesis 12$_e$.

Hypothesis 12$_f$. tested the influence of interactive features on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was not statistically significant, indicating that interactive features in a restaurant branded mobile app do not have any influence on customer satisfaction with a restaurant branded mobile app (t-value = 0.683, p > 0.10). Thus, this result does not support Hypothesis 12$_f$.

Hypothesis 12$_g$. tested the influence of customization features on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was statistically significant, indicating that customization features in a restaurant branded mobile app do have an influence on customer satisfaction with a restaurant branded mobile app (t-value = 2.971, p < 0.01). Thus, this result supports Hypothesis 12$_g$., which emphasizes the importance of the mobile app customization features.

Hypothesis 12$_h$. tested the influence of privacy features on customer satisfaction with a restaurant branded mobile app. The path coefficient between this hypothesized relationship was statistically significant, indicating that privacy features in a restaurant branded mobile app do have an influence on customer satisfaction with a restaurant branded mobile app (t-value = 2.021, p < 0.05). Thus, this result supports Hypothesis 12$_h$., which emphasizes the importance of the mobile app's privacy features.

Hypothesis 12$_i$. stated that customer satisfaction with a restaurant branded mobile app positively impacts the customer continuance intention of the restaurant branded mobile app. The path coefficient between this hypothesized relationship was statistically significant, indicating

that customer satisfaction with a restaurant branded mobile app does have an influence on the customer continuance intention of a restaurant branded mobile app (t-value = 21.122, p < 0.001). Thus, this result supports Hypothesis 12_i.

Website Results

Hypothesis 13_a tested the influence of functional values on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was not statistically significant, indicating that functional values do not have any influence on customer satisfaction with a restaurant branded website (t-value = 1.623, p > 0.10). Thus, this result does not support Hypothesis 13_a.

Hypothesis 13_b tested the influence of emotional values on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was statistically significant, indicating that emotional values do have an influence on customer satisfaction with a restaurant branded website (t-value = 3.802, p < 0.001). Thus, this result supports Hypothesis 13_b.

Hypothesis 13_c tested the influence of social values on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was statistically significant, indicating that social values do have an influence on customer satisfaction with a restaurant branded website (t-value = 2.166, p < 0.05). Thus, this result support Hypothesis 13_c. This finding is interesting because it was the only type of SST that shows the importance of social values on customer satisfaction with the restaurant website experience.

Hypothesis 13_d tested the influence of epistemic values on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was not

statistically significant, indicating that epistemic values do not have any influence on customer satisfaction with a restaurant branded website (t-value = 0.839, p > 0.10). Thus, this result does not support Hypothesis 13_d.

Hypothesis 13_e tested the influence of conditional values on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was not statistically significant, indicating that conditional values do not have any influence on customer satisfaction with a restaurant branded website (t-value = 1.313, p > 0.10). Thus, this result does not support Hypothesis 13_e.

Hypothesis 13_f. tested the influence of interactive features on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was not statistically significant, indicating that interactive features in a restaurant branded website do not have any influence on customer satisfaction with a restaurant branded website (t-value = 1.288, p > 0.10). Thus, this result does not support Hypothesis 13_f.

Hypothesis 13_g. tested the influence of customization features on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was statistically significant, indicating that customization features in a restaurant branded website do have an influence on customer satisfaction with a restaurant branded website (t-value = 3.404, p < 0.01). Thus, this result supports Hypothesis 13_g.

Hypothesis 13_h. tested the influence of privacy features on customer satisfaction with a restaurant branded website. The path coefficient between this hypothesized relationship was not statistically significant, indicating that privacy features in a restaurant branded website do not have any influence on customer satisfaction with a restaurant branded website (t-value = 1.174, p > 0.10). Thus, this result does not support Hypothesis 13_h.

Hypothesis 13$_i$. stated that customer satisfaction with a restaurant branded website positively impacts the customer continuance intention of a restaurant branded website. The path coefficient between this hypothesized relationship was statistically significant, indicating that customer satisfaction with a restaurant branded website does have an influence on the customer continuance intention of a restaurant branded website (t-value = 8.627, p < 0.001). Thus, this result supports Hypothesis 13$_i$. Appendix A includes the PLS structural model results for each type of SST.

Summary of Results

As mentioned in the previous section, the results showed that functional, emotional, and social values, as well as interactive, and customization features in SSTs are important factors of customer satisfaction with the SST experience. These findings support the overall model related hypotheses 1, 2, 3, 6, and 7. The results also indicate that satisfaction with an SST experience leads to continuance intention, which provides support to hypothesis 9. Although, hypothesis 8, which is related to SST privacy features, was not supported in the overall model, it was supported in the mobile app path model. Hypotheses 4 and 5 were not supported in any models, which indicate that epistemic and conditional values have no influence on customer satisfaction with the SST experience. The overall model shows that 78.1% of customer satisfaction with SSTs was explained by functional, emotional, social, epistemic, conditional, interactive, customization, and privacy value dimensions. In general, the model shows that satisfaction with the restaurant SSTs explained 61% of restaurant customers' continuance intention behavior.

The kiosk results showed that functional and emotional values, as well as customization features in SSTs, are important factors of customer satisfaction with the restaurant kiosk experience. These findings support the kiosk model related hypotheses 10$_a$, 10$_b$, and 10$_g$. The

results also indicate that satisfaction with a restaurant kiosk experience leads to continuance intention, providing support to hypothesis 10_i. The following hypotheses 10_c, 10_d, 10_e, 10_f, and 10_h in the kiosk model, were not supported. The kiosk model shows that 83.7% of customer satisfaction with a restaurant kiosk was explained by functional, emotional values, and customization features. The model shows that satisfaction with a restaurant kiosk explained 71.5% of restaurant kiosk continuance intention.

The tabletop results showed that emotional value and customization features are the most important factors for customer satisfaction with a restaurant tabletop experience. These findings provide support to the tabletop model related hypotheses 11_b and 11_g. The results also indicate that satisfaction with a restaurant tabletop experience leads to continuance intention, providing support to hypothesis 11_i. However, hypotheses 11_a, 11_c, 11_d, 11_e, 11_f, and 11_h were not supported, indicating that functional, social, epistemic, and conditional values, along with interactive and privacy features, are not an important factor to customer satisfaction with a restaurant tabletop experience. The tabletop model shows that 81.8% of customer satisfaction with a restaurant tabletop was explained by emotional values and customization features. The model also shows that satisfaction with a restaurant tabletop explained 69.1% of the continuance intention behavior.

The mobile app results showed that functional and emotional values, as well as customization and privacy features in SSTs, are important factors of customer satisfaction with a restaurant branded mobile app experience. These findings support the mobile app model related hypotheses 12_a, 12_b, 12_g, and 12_h. Furthermore, the results indicate that satisfaction with the restaurant proprietary mobile app leads to the consumers' continuance intention, providing support to hypothesis 12_i. However, hypotheses 12_c, 12_d, 12_e, and 12_f were not supported,

indicating that social, epistemic, and conditional values, as well as interactive features, are not an important factor to customer satisfaction with the restaurant mobile app experience. The mobile app model shows that 73.7% of customer satisfaction with a restaurant branded mobile app was explained by functional and emotional values, along with customization and privacy features. The model also shows that satisfaction with a restaurant mobile app explained 54.4% of the continuance intention behavior.

The website results showed that emotional and social values, along with customization features, are important factors of customer satisfaction with a restaurant branded website experience. These findings provide support to hypotheses 13_b, 13_c, and 13_g. The results showed that satisfaction with a restaurant website leads to continuance intention, providing support to hypothesis 13_i. On the other hand, hypotheses 13_a, 13_d, 13_e, 13_f, and 13_h were not supported, denoting that functional, epistemic, and conditional values, as well as interactive and privacy features, are not an important factor to customer satisfaction with a restaurant website. The model shows that 66.1% of customer satisfaction with a restaurant website was explained by emotional and social values, along with customization features. The model also shows that satisfaction with a restaurant website explained 40.6% of the continuance intention behavior.

Overall, the results of the restaurant SSTs indicate that emotional values were the most influential factors on customer satisfaction with the restaurant SST experience. In addition to the importance of emotional values on the SST experience, the results showed that customization features are positively related to customer satisfaction with all the SSTs included in this study. The results also revealed that functional values in the restaurant SSTs do have some impact on customer satisfaction with all SSTs except the restaurant website.

The results from the PLS-MGA revealed that most structural path relationships across the four types of SSTs were similar. The outcome results from comparing the kiosk vs. mobile app revealed that the relationship between privacy features and satisfaction with SSTs is significantly different in a restaurant mobile app than in a kiosk. Furthermore, the results indicated that the relationship between customer satisfaction with SSTs and their continuance intention is significantly different in a restaurant mobile app than in a kiosk. Next, the comparison of kiosk vs. website shows that the relationship between customer satisfaction with SSTs and the continuance intention is significantly different in a restaurant kiosk than for a restaurant website. Finally, the results of comparing the tabletop vs. the website revealed that the relationship between customer satisfaction with SSTs and their continuance intention is significantly different for a restaurant tabletop than for a restaurant website. Table 22 provided the complete results of the PLS-MGA for all SSTs.

Table 22: Types of SST Path Coefficient Results

Kiosk Specific Relationships	Path Coefficient	t-Values	p-Values	95% Confidence Intervals	Significant levels	Results
H10a. Functional Values -> Satisfaction SST	0.165	3.067	0.002	[0.064, 0.279]	**	Supported
H10b. Emotional Values -> Satisfaction SST	0.477	6.834	0.000	[0.347, 0.625]	***	Supported
H10c. Social Values -> Satisfaction SST	0.056	1.504	0.133	[-0.017, 0.130]	NS	Not Supported
H10d. Epistemic Values -> Satisfaction SST	0.021	0.423	0.672	[-0.070, 0.120]	NS	Not Supported
H10e. Conditional Values -> Satisfaction SST	-0.015	0.354	0.723	[-0.116, 0.058]	NS	Not Supported
H10f Interactive Features -> Satisfaction SST	0.081	1.381	0.167	[-0.031, 0.201]	NS	Not Supported
H10g. Customization -> Satisfaction with SST	0.316	4.973	0.000	[0.198, 0.449]	***	Supported
H10h. Privacy -> Satisfaction SST	-0.041	0.816	0.414	[-0.134, 0.064]	NS	Not Supported
H10i. Satisfaction SST -> Continuance intention	0.847	27.974	0.000	[0.777, 0.895]	***	Supported

R^2

Satisfaction with SST = 0.837

Continuance intention = 0.715

Notes: $*p < 0.05$; $**p < 0.01$; $***p < 0.001$, NS= Not Significant   *(continued)*

Tabletop Specific Relationships	Path Coefficient	t-Values	p-Values	95% Confidence Intervals	Significant levels	Results
H11a. Functional Values -> Satisfaction SST	0.124	1.617	0.106	[-0.011, 0.287]	NS	Not Supported
H11b. Emotional Values -> Satisfaction SST	0.485	6.357	0.000	[0.343, 0.642]	***	Supported
H11c. Social Values -> Satisfaction SST	0.019	0.366	0.714	[-0.087, 0.121]	NS	Not Supported
H11d. Epistemic Values -> Satisfaction SST	-0.019	0.490	0.624	[-0.094, 0.057]	NS	Not Supported
H11e. Conditional Values -> Satisfaction SST	-0.010	0.253	0.801	[-0.090, 0.073]	NS	Not Supported
H11f Interactive Features -> Satisfaction SST	0.032	0.564	0.573	[-0.082, 0.146]	NS	Not Supported
H11g. Customization -> Satisfaction with SST	0.380	4.921	0.000	[0.230, 0.527]	***	Supported
H11h. Privacy -> Satisfaction SST	-0.030	0.499	0.618	[-0.143, 0.083]	NS	Not Supported
H11i. Satisfaction SST -> Continuance intention	0.832	23.424	0.000	[0.750, 0.888]	***	Supported

R^2

Satisfaction with SST = 0.818

Continuance intention = 0.691

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, NS= Not Significant   *(continued)*

Mobile App Specific Relationships	Path Coefficient	t-Values	p-Values	95% Confidence Intervals	Significant levels	Results
H12a. Functional Values -> Satisfaction SST	0.211	2.584	0.010	[0.042, 0.363]	*	Supported
H12b. Emotional Values -> Satisfaction SST	0.350	3.741	0.000	[0.163, 0.535]	***	Supported
H12c. Social Values -> Satisfaction SST	0.047	0.839	0.401	[-0.065, 0.155]	NS	Not Supported
H12d. Epistemic Values -> Satisfaction SST	0.004	0.081	0.935	[-0.091, 0.096]	NS	Not Supported
H12e. Conditional Values -> Satisfaction SST	-0.045	0.719	0.472	[-0.165, 0.083]	NS	Not Supported
H12f Interactive Features -> Satisfaction SST	0.043	0.683	0.495	[-0.082, 0.164]	NS	Not Supported
H12g. Customization -> Satisfaction with SST	0.247	2.971	0.003	[0.087, 0.414]	**	Supported
H12h. Privacy -> Satisfaction SST	0.142	2.021	0.043	[0.012, 0.288]	*	Supported
H12i. Satisfaction SST -> Continuance intention	0.740	21.122	0.000	[0.658, 0.798]	***	Supported

R^2

Satisfaction with SST = 0.737

Continuance intention = 0.544

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, NS= Not Significant   *(continued)*

Website Specific Relationships	Path Coefficient	*t*-Values	*p*-Values	95% Confidence Intervals	Significant levels	Results
H13ₐ. Functional Values -> Satisfaction SST	0.176	1.623	0.105	[-0.052, 0.373]	NS	Not Supported
H13_b. Emotional Values -> Satisfaction SST	0.324	3.802	0.000	[0.158, 0.492]	***	Supported
H13_c. Social Values -> Satisfaction SST	0.114	2.166	0.030	[0.012, 0.223]	**	Supported
H13_d. Epistemic Values -> Satisfaction SST	0.045	0.839	0.401	[-0.056, 0.154]	NS	Not Supported
H13_e. Conditional Values -> Satisfaction SST	-0.068	1.131	0.258	[-0.183, 0.052]	NS	Not Supported
H13_f Interactive Features -> Satisfaction SST	0.089	1.288	0.198	[-0.040, 0.227]	NS	Not Supported
H13_g. Customization -> Satisfaction with SST	0.294	3.404	0.001	[0.122, 0.456]	**	Supported
H13_h. Privacy -> Satisfaction SST	0.079	1.174	0.241	[-0.051, 0.213]	NS	Not Supported
H13_i. Satisfaction SST -> Continuance intention	0.641	8.627	0.000	[0.469, 0.758]	***	Supported

R^2

Satisfaction with SST = 0.661

Continuance intention = 0.406

Notes: *p < 0.05; **p < 0.01; ***p < 0.001, NS= Not Significant

Summary of the Study

The purpose of this dissertation was to examine the influence of SSTs value dimensions on restaurant customers' satisfaction and continuance intention, and explore if the types of SSTs can impact these relationships. To accomplish this goal, the SST values that influence a restaurant customer's utilization decision and continuance intention were identified and empirically tested.

Consistent with previous research on consumer behavior literature, the proposed theoretical model hypothesized that the TCV five dimensions (functional, emotional, social, epistemic, and conditional values) influence customer satisfaction with SSTs in the restaurant context, which, in turn, influence continuance intention. More specifically, the author proposed that the TCV dimensions influence consumer SST experience, and if customers are satisfied with a specific SST, most probably they will continue to use it in the future. To capture a more holistic view, the author included in the model an additional three SST values as follows: interactive features, customization features, and privacy features. In relation to the model outcome constructs, satisfaction with SSTs and continuance intention were included as endogenous variables. To examine the hypothesized relationships in the conceptual model, a quantitative research method was utilized.

To collect the required data for this study, self-administered online questionnaires were developed for each SST platform included in this study (kiosk, tabletop, mobile app, and web-based SST). The questionnaires were developed in Qualtrics and distributed via Amazon mechanical Turk (MTurk). The data was collected in May 2019 from restaurant customers who previously used/experienced one of four SSTs. A data preparation procedure was conducted to

ensure the usability of the data. Thus, a total of 619 questionnaires were usable and retained for the data analysis procedures.

Next, the researcher imported the data into Stata/SE v 15.0 for the preliminary data analysis and for screening to examine the data. Descriptive analysis was performed for respondents' sociodemographic and SSTs experience evaluation. Two steps were followed to assess the model. First, the measurement model was validated, and the researcher ensured that content validity, convergent validity, and discriminant validity were established before examining the structural model. Second, PLS-SEM was utilized to assess the structural model, and PLS-MGA was used to compare the path model of each type of SST. The path modeling software packages SmartPLS 3 was used to conduct the model assessment and analysis. The following section presents the discussion structural model results for each type of SST.

Chapter Summary

This chapter presented the results of the study. The first section of the chapter outlined the procedures that the researcher followed to prepare that data for the analysis. A total of 619 valid responses were used in the data analysis. Descriptive statistics were performed for respondents' sociodemographic and SSTs experience evaluation. PLS-SEM two steps were utilized to assess the measurement and the structural models. PLS-MGA was conducted to compare the path model across the four types of SST (kiosk, tabletop, mobile app, and website). The rest of the chapter discussed the results of the hypothesized relationships.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

Chapter Overview

This chapter begins with a summary of the dissertation methods, followed by a discussion of the study results in relation to the hypothesized theoretical model. Furthermore, theoretical and practical implications of the results are discussed. Finally, the chapter concludes with discussing the limitations of the study along with future research directions.

Discussion of Results

Consumer behavior and technology continuance intention research has focused on the factors that influence a consumer's decision to use or not to use SSTs. This type of research is very limited in the hospitality industry and, more specifically, in the restaurant industry. Thus, limited information is available regarding how restaurant customers evaluate different types of SSTs.

There is a need to understand the factors that impact the restaurant customer's decision to utilize SSTs in the dining experience. In addition, research in this area is very important to restaurant strategic decision making when it comes to investing in technology and ensuring the highest satisfaction level with the SST experience. The majority of previous research in the hospitality industry, specifically the restaurant industry, has focused on technology acceptance and consumer evaluation of one type of SST (i.e. kiosk, tabletop, mobile app, or website). This leaves a wide gap in the literature concerning SST consumption values and their impact on customer satisfaction and continuance intention. This study seeks to fill this gap in the body of knowledge.

This study contributes to the body of knowledge related to consumer behavior and continuance intention in the context of restaurant SSTs. The study enriches the TCV by including three contextual factors (interactive features, customization, and privacy) related to features of the restaurant SSTs. Furthermore, the study model was further extended by including a second outcome construct of SST continuance intention to better understand the influence of SST values on customer satisfaction with SSTs and continuance intention. This study also identified the most important consumption values that highly contribute to customer satisfaction with SSTs and continuance intention. Thus, a restaurateur should pay close attention to the

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functional, emotional, social, and customization aspects of the SSTs. It is also important to

conduct an ongoing evaluation of the customer wants, needs, and expectations from using

restaurant SSTs. By identifying the important factors that influence a customer's decision to use

certain types of SSTs, restaurant operators can focus their attention and financial investments

toward obtaining the highest influential SST platforms or features. Consequently, satisfaction

with SSTs indicates that customer will have a pleasant experience, which will be translated to

continuance intention of SSTs.

To examine the hypothesized theoretical model, PLS-SEM and PLS-MGA were

conducted. This statistical method was the most suitable analysis techniques because the focus of

this study is to predict and explains the hypothesized relationships (Hair et al., 2017). The PLS

model analysis was conducted in two steps, the first of which begins with an assessment of the

measurement model followed by an assessment of the structural model. The evaluation of the

reflective measurement model allows the research to ensure the reliability and validity of all

constructs included in the model and to justify their inclusion in the path model (Hair et al.,

2017). The evaluation of the structural model allows the researcher to ensure that there are no

multicollinearity issues between indicators and to test the hypothesized relationships (Hair et al.,

2017). The overall model results showed that all hypotheses were supported, except the

hypotheses related to epistemic and conditional values, and privacy feature in SSTs. The results

of the specific SST types revealed that all hypotheses were supported, except the hypotheses

related to epistemic and conditional values, and interactive and privacy feature in SSTs. The

privacy feature was supported only in the mobile app model. A summary of the hypotheses

results for the overall model and for the SSTs specific model is presented in Chapter 4, Table 22.

The overall model shows that 78.1% of customer satisfaction with SSTs was explained by SSTs values (functional, emotional, social, epistemic, conditional, interactive, customization, and privacy). These results showed that the SSTs values are very important drivers of customer satisfaction with SSTs. The second part of the model results showed that 61% of SSTs continuance intention was explained by customer satisfaction with SSTs. This finding indicates that satisfaction with SSTs experience will interest customers to continue using restaurant SSTs. Additionally, the path coefficients results showed that satisfaction with SSTs is the most powerful reason that makes a customer continue to use restaurant SSTs.

Overall, the theoretical model in this study showed that functional and emotional values, and customization feature are the most influential factors that provides satisfaction with the SST experience to restaurant customers. On the other hand, if the restaurant SSTs lack in the functional and emotional, values which customers wanted, the SSTs experience will be unpleasant and frustrating, and the customer will not use the restaurant SSTs again. In general, these results demonstrate the importance of SSTs values on customer satisfaction. Thus, the restaurateur must ensure that the SSTs are designed to meet their customers' expectations. Since the main purpose of this study is to provide an evaluation of the four types of restaurant SSTs, a detailed discussion of the types of SSTs results are necessary.

This study proposed that TCV dimensions will have a positive impact on restaurant customer satisfaction with SSTs and continuance intention. The results from the overall model revealed that functional, emotional, and social values are the most influential dimensions from the TCV that significantly contribute to restaurant customer satisfaction with the SST experience. Previous studies emphasized the importance of the functional and emotional values of restaurant SSTs on customer satisfaction (Ahn & Seo, 2018; Meuter et al., 2000; Wei et al.,

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2017). Furthermore, a previous study found a direct impact of social values and SST use in the retail context (Sheth et al., 1991a). These findings contribute to the current literature by empirically supporting the relationship between functional, emotional, and social values and customer satisfaction with SSTs.

In contrast with previous studies, the study findings do not support the proposed relationships for epistemic and conditional values. This might be due the fact that this study evaluated current SSTs users, and the results may differ if the SSTs were used for the first time. One previous study found that epistemic values or seeking exploration can enhance customer satisfaction with the SST experience in the on-demand online entertainment service context (Collier & Sherrell, 2010). It was also found that novelty seeking positively influences a consumer's decision to use SSTs in the retail context (Evanschitzky, Iyer, Pillai, Kenning, & Schute, 2015). In the current study, it was proposed that conditional values will have a positive impact on customer satisfaction with SSTs; however, the results did not support this hypothesized relationship. Interestingly, a study in the QSR setting found a significant relationship between novelty seeking and the use of SST (Dabholkar & Bagozzi, 2002), which illustrates that epistemic values may have an influence on customer intention use and not on those who previously experienced SSTs. A previous study shows that conditional values influence the restaurant customer to use SSTs (Dabholkar, 1996; Dabholkar & Bagozzi, 2002), which also indicates that the impact of the conditional values may occur prior to the actual use of SSTs. In the retail setting, Wang et al. (2012) found that conditional values have an influence on a consumer's decision to use SSTs.

This study included three additional SST value dimensions (interactive features, customization features, and privacy feature) to the theoretical model to attain a comprehensive

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customer evaluation of SSTs in restaurant settings. The results indicated that interactive features and customization features have a positive impact on customer satisfaction with SSTs and continuance intention (H6 & H7), which is in accordance with previous study findings (Lin & Hsieh, 2011; Orel & Kara, 2014). In relation to SSTs interactive features, the findings from the current study support previous findings which emphasize the important of interaction features in the hotel SSTs (Brochado et al., 2016). Furthermore, SSTs interactive features were found to be a significant factor in customer satisfaction in the web-based services (Yen, 2005). However, this study was not able to support the proposed relationship between the SSTs privacy features and customer satisfaction with SSTs (H8), which is not what previous studies found (Lin & Hsieh, 2011). Finally, satisfaction with SSTs experience is found to influence the restaurant customer's continuance intention (H9), which supports the findings in previous studies (Chen, Chen, & Chen, 2009; Collier & Sherrell, 2010). The next section will provide a discussion of the types of SST results.

In the kiosk model, the results revealed that functional and emotional values as well as customization features all have a positive impact on customer satisfaction with the kiosk use experience (H10a, H10b, & H10g). The findings from the kiosk model support previous study results in the hospitality industry context (Kim et al., 2013; Rosenbaum & Wong, 2015; Wei et al., 2017). These findings emphasized on the importance of functional, emotional and customization values to kiosk users in the hospitality industry. Furthermore, the study found that social, epistemic, and conditional values have no influence on customer satisfaction with a restaurant kiosk system. A previous study found that conditional values and specifically waiting time was a major factor that attracts the customer to utilize a hotel check-in kiosk (Kokkinou & Cranage, 2015), which may not be the case in the QSR kiosk experience. The kiosk system in

QSR is designed to provide the customer with a quick order and pay options, and it is usually not associated with a long waiting time or any interactive features. In contrast with a previous study, kiosk privacy features were not found to have an impact on customer satisfaction, as it relates to hotel kiosk setting (Kim & Qu, 2014). This indicates that a kiosk privacy feature is not a high concern for the restaurant customer as it is for a hotel guest, and this seems to be acceptable due to the difference in service and cost between a restaurant and a hotel (i.e. a meal cost $5 vs a room cost $100). The current study found that satisfaction with the restaurant kiosk experience will yield continuance use, which is similar to previous study findings from the retail setting (Lee, Fairhurst, & Lee, 2009).

The second model examined the tabletop SST perceived values. The results showed that only emotional values have a positive impact on the restaurant customer's satisfaction with the tabletop use experience. These findings support previous studies similar results in the context of the hospitality industry (Wang & Wu, 2014; Wei et al., 2017). The results of the current study were not able to support the functional values in the tabletop as did previous study findings (Wang & Wu, 2014). This may explain the limitations that current implemented systems offer to customers. This study proposed that social values influence customer satisfaction with the restaurant tabletop experience. In contrast with previous studies in the hotel industry settings (Kim et al., 2017), the current study was not able to support this hypothesized relationship. Similarly, epistemic values were not found to be significant, as previous study found an impact of novelty seeking on customer intentions to utilize restaurant tabletop. The findings did not support the relationship between conditional values and customer satisfaction with the tabletop experience. Furthermore, the SSTs interactive features in the tabletop were found to be insignificant, which is opposite to which was found in a previous study (Chen et al., 2011). This

finding indicates that the design of a tabletop system is not up to the restaurant expectations. On the other hand, the tabletop customization features were found to an important factor to customer satisfaction with the tabletop experience, supporting the findings from a recent study (Ahn & Seo, 2018). In regard to the privacy features in the restaurant tabletop, this study found no relationship between tabletop privacy feature and customer satisfaction. These findings were the opposite to a recent study in a similar context which found that the restaurant customer utilized SSTs to protect their credit card information (Susskind & Curry, 2016). Furthermore, satisfaction with the tabletop experience will encourage customer to reuse the platform in future dining experiences, which is in accordance with a recent study finding (Susskind & Curry, 2016).

In the mobile app model, the results showed that functional, emotional, customization, and privacy of mobile app value dimensions significantly influence customer satisfaction with the restaurant apps. These finding provide support to what previous studies have found in regard to functional values (Choi, Wang, & Sparks, 2018); emotional values (Kim, Chung, Lee, & Preis, 2015); privacy and customizations features (Fang, Zhao, Wen, & Wang, 2017). On the other hand, the current study was not able to support the hypothesized relationship between social values and customer satisfaction with mobile app and support similar findings in previous studies (Rita et al., 2018). Similarly, a recent study found that social values were not significant driver of customer satisfaction in the context of the retail mobile app (Iyer, Davari, & Mukherjee, 2018). Satisfaction with the mobile app experience will enhance continuousness of usage, and these findings was in line with previous studies findings (Akter, D'Ambra, & Ray, 2013; Shang & Wu, 2017).

The results from the website model reveals that functional values have no influence on customer satisfaction. This was the opposite of previous studies findings which show that

website functional values are an important driver of customer satisfaction and continuance intention in travel related online services (Liao & Shi, 2017; Shchiglik & Barnes, 2004). These findings may indicate the limitations of the current utilization of a restaurant website if compared with airlines and travel online platforms. In terms of the emotional values, this study found hedonic factors to be important determinant of customer satisfaction with a restaurant website. These findings were similar to previous studies findings (Bilgihan & Bujisic, 2015; Cheng, Wang, Lin, & Vivek, 2009; Wani et al., 2017). The current study found that social values have an influence on customer satisfaction with restaurant websites, which support other similar findings (Chen & Wang, 2016). However, the findings from the current study were not able to confirm the proposed relationship between epistemic values and customer satisfaction with a restaurant website, which is in contrary with other studies in the retail e-shopping context (Cheng et al., 2009). These findings may alert the restaurateur to reevaluate the restaurant website in order to make it more attractive to customers. Furthermore, the website interactive features were not found to have a significant impact on customer satisfaction, which is contrast with previous studies finding from the hotel industry context (Scharlr et al., 2003). Finally, the current findings from all types of SSTs emphasized on the importance of customization features. These findings support previous studies, which found that customization is an important factor of customer satisfaction with web-based services (Kang & Lee, 2015; Kim, Lee, Lee, Joung, & Yuan, 2012).

Implications

The current study provides several implications. This section discusses the implications of the current study findings. The first part focuses on the theoretical implications. The second part focuses on the managerial implication for the restaurant industry.

Theoretical Implications

This study examined the influences of SSTs values on customers' satisfaction and continued use intention utilizing the TCV dimensions (Sheth et al., 1991b), the Information system (IS) Continuance Intention Model (Bhattacherjee, 2001), and the SSTQUAL (Lin & Hsieh, 2011). The study also included three additional SSTs value constructs to the proposed model: interactive values, customization values, and privacy values, to capture a holistic view of consumer perspectives of restaurant SSTs. Furthermore, and most importantly, this study examined multiple types of proprietary restaurant SSTs, which, to the author's best knowledge, is one of the first research attempts conducted in the hospitality context. In terms of the research methodology contribution, this study utilized an infrequently used analysis method in the hospitality discipline, PLS-SEM and PLS-MGA (Hair et al., 2017; Hair, Sarstedt, Ringle, & Gudergan, 2018). The findings from this not only contributes to the fields of hospitality and tourism, but also spills over to other fields such as marking, psychology, and information technology. All these theoretical contribution points are discussed in detail in the following paragraphs.

First, previous studies in the hospitality context rarely utilized TCV. This study contributes to the current knowledge from multiple disciplines by combing constructs form TCV. (Sheth et al., 1991b), IS Continuance Intention Model (Bhattacherjee, 2001), and the SSTQUAL (Lin & Hsieh, 2011) to examine the impact of SSTs values on restaurant customer behavioral intention. The findings from the combinations of TCV, IS continuance intention, and SSTQUAL provide a better understanding of the SSTs important values for restaurant customers satisfaction and continuance intention. The findings also provide support to each theory and model utilized in the current study. For instance, this study found that functional, emotional, and social values are

among the most important values on restaurant customer satisfaction with SSTs and continuance intention. Therefore, this results contributes to the original TCV model by providing empirical evidence that proves the importance of functional, emotional, and social SSTs values in the restaurant and hospitality settings (Baiomy et al., 2017; Choi, Wang, et al., 2018; Rosengren & Prebensen, 2016). For the SSTQUAL, the current study findings indicate that customization and interactive features are valued by restaurant SSTs users, providing support to the original SSTQUAL. In the same line, the finding from this study provide more support to the IS continuance intention model by empirically proving that satisfaction with SSTs influences restaurant customer's continuance intention.

Second, previous studies examined technology use intention only by adapting TAM or UTAUT (Kim et al., 2017), which is limited and did not provide a complete picture of the consumer post adaption behavior towards using restaurant SSTs. Thus, this study utilized the IS continuance intention model to examine consumer post adaption behavior. The findings provided enhance our knowledge by understanding customer expectations of SSTs and the importance of meeting those expectations to ensure customers' continuity use of restaurant SSTs so that better operational and strategical decision can be made when implementing new SSTs or re-evaluating current SSTs Furthermore, this study includes three additional constructs that TCV do not clearly capture in the current study context. The addition of the interactive features, customization features, and privacy feature distinguish this study from previous studies (Choi, Law, & Heo, 2018) and contribute greatly to the SSTs perceived values area. The current study found that SSTs interactive features and customization features are important factors to restaurant customers' satisfaction and continuance intention behavior in all four SSTs platforms. These finding contribute to the current literature in interactive technology design and value co-creation

in general (Chathoth, Ungson, Harrington, & Chan, 2016; Zhang et al., 2018) and in technology-based services. As a result, SST providers can work closely with restaurateurs to design SSTs that enhance the customer experience. In terms of SST privacy features in restaurant mobile apps, this study found SSTs privacy significantly influences the restaurant customer's satisfaction and continuance intention. This finding adds to the current literature in the mobile technology privacy and security research by emphasizing the importance of privacy and security features that customers would like to have in an app.

Third, to the best of the author's knowledge, this study in among the first to incorporate multiple SSTs evaluation within the restaurant settings, with two exceptions in the service marketing literature (Collier et al., 2014; Robertson et al., 2016). Therefore, this study provides a more holistic evaluation of the most popular SSTs utilized in the restaurant industry. Despite the variety of SSTs implemented in the hospitality and tourism businesses, previous studies in the field have treated SSTs generically without proper typology or classification (Kaushik & Rahman, 2017; Kim et al., 2017). In addition, there is no current research which combines multiple types of SSTs with the utilization of multiple theoretical background from various fields of research. This is considered a major contribution derived from the current study because it will prove which SSTs customers want and prefer to use. Furthermore, this evaluation of SST types in the restaurant industry will hopefully encourage other scholars to conduct more research on SSTs in the hospitality and tourism industry. Besides that, the utilization of the TCV in this study revealed the important values that motivate restaurant customers to use specific types of SSTs. This study included four types of restaurant SSTs and examined the perceived values of each type by utilizing multiple theoretical frameworks from previous studies. The results from this evaluation further enrich the related literature on the area related to types of SSTs and

strengthen the theoretical model of the current study by incorporating several constructs from multiple disciplines (Lin & Hsieh, 2011; Sheth et al., 1991b). Furthermore, the findings from this study provide the academic community with valuable information to better understand the importance of the values of each type of SSTs that influence the restaurant customer's experience.

Last, but not least, this study provides a unique methodological contribution. The utilization of both PLS-SEM and PLS-MGA will encourage future research to use uncommon methods. In this study, six PLS-SEM models were generated to conduct the required comparison between the multiple types of SSTs. To sum up, the overall model of the current study contributes to the current theoretical understanding of what SSTs values restaurant customers expect and which of those values contribute greatly to customer satisfaction with SSTs and continuance intention behavior.

Practical Implications

There are many practical implications that can be derived from the current study findings. It is believed that the implications of the current study will provide several benefits to the restaurateurs. The findings suggest that restaurant operators who are planning to implement SSTs in their restaurants should perform a comprehensive evaluation of the current and future needs of their customers. Managers can use the SSTs value dimensions from this study to conduct the pre-implementation evaluation procedure. For those restaurants who already have SSTs on the premises, an evaluation of their current SSTs based on their customer point of view is required to ensure the sustainability of the offered SST. These evaluation procedures allow the restaurateur to know which SSTs values customer expect and appreciate; thus, it will help restaurant companies to allocate the required resources for successful SST implementation. The findings

from this study provide empirical evident of the importance SSTs values that enhance customer satisfaction and continuance intention. This will also help restaurateurs to be better informed about their target market and customer needs and wants. The following section will shed more light on the major contribution of the current study by providing more detailed practical implications for each type of SSTs examined in this study.

First, the finding from the restaurant kiosk model analysis stressed on the importance of functional, emotional, and customization values on customer satisfaction with restaurant kiosk and continuance intention. These findings are directed mostly to QSR restaurants who have adopted a kiosk in their restaurant. Managers at a QSR restaurant should emphasize the functional aspect that a kiosk offers customers. For instance, the kiosk should be provided to customers with user friendly interfaces that enhance the customer order experience. The kiosk system should be free from technical error, easy to use for customers to explore the menu, place an order, and complete payment quickly. If these characteristics are met, customers will eventually enjoy the experience of using the restaurant kiosk because it provides what is expected from it. Hence, SST providers should integrate the functional and emotional aspects when designing a restaurant kiosk. For example, for a kiosk to be enjoyable, it has to located away for the cashier lines in order to provide customers with the needed space and the ability not to feel as though they must rush in their use of it. Furthermore, more emphasis should be directed to the size of the kiosk screen and resolution. In addition, it should contain the full menu and be available in different languages in order to create an enjoyable restaurant kiosk experience. The results indicated that customers appreciate the customization feature that a restaurant kiosk offers, which is a clear indication to restaurant managers about the importance of allowing the customer to customize the meal without restrictions. Restaurant managers should always aim to

provide an exceptional kiosk experience since this will increase customer intention to continue to reuse the restaurant kiosk.

Second, based on the restaurant tabletop results, this study recommends that restaurant managers need to improve their current limited functions and provides their customer with more control over the tabletop tablet. For instance, as mentioned earlier in Chapter two, most of the current adopted tabletop menus are limited in terms of functionality; thus more work needs to be done in order to enhance the productivity of this platform. Restaurateurs are encouraged to listen to their customers and get an overview of the missing functions that needed to be incorporated into the current tabletop. This will enhance the customer experience with the restaurant tabletop and eventually will satisfy customers' needs and wants from this technology. In regard to emotional values in the restaurant tabletop, managers should provide more enjoyable technological experience by including more entertainment features to their customers while waiting for their meal to be prepared. The study findings indicate that the tabletop was not at the level of customer expectation due to its limited functions. For example, games alone are not enough; hence, more interactive features, such as free internet access, social media, and TV channels, are expected to enhance customer emotions. The study findings also emphasize the importance of customization features, and so managers should design a tabletop menu that gives customers complete control to customize their meal and service as they prefer.

Third, based on the restaurant mobile app results, managers should improve the functionality of their restaurant mobile apps. For instance, providing multiple options for payment, such as apple pay instead of inserting credit card information, is believed to deliver more convenience to customers. Such features, among others that restaurant managers may add to their mobile apps, will make the experience more enjoyable. The restaurateur should get their

customers' opinions on which features they want to see in the mobile apps. The findings also indicate that customers do appreciate the customization and the privacy features the restaurant mobile app provided to them. Therefore, restaurant operators and mobile apps providers should work together to maintain the customization and the privacy features in order to ensure customer satisfaction with the use of mobile apps. Providing mobile apps that exceed customer expectation would ensure their continuance intentions may spill over to recommend the apps to others.

Last, but not least, based on the restaurant website results, managers should pay close attention to their website functionality. For instance, restaurant website should be easy to navigate on different devices and operating systems. Furthermore, restaurant website should be designed in a way that enhance customer controllability over the entire experience. As in all previous SSTs, customization features are among the most important factors that enhance customer satisfaction and continuance intention. Overall, managers should conduct an ongoing evaluation of their SSTs based on their customers' point of view.

Limitations and Future Research

As in any research, this study has encountered some limitations which may yield several areas for future research. First, the current study collected the required data by utilizing a cross-sectional survey method, which may limit the generalizability of the findings in a different context and period of time. Future research may conduct a longitudinal study to see if consumer behavior toward SSTs in the restaurant context changes over time. This will also help industry professionals to understand the changing environment of SSTs development, as well as understanding their customer's dynamic needs and wants. The current study adopted previously well-established measurement items from outside the hospitality research discipline; future study

is encouraged to develop a specific measurement scale for SSTs value in the restaurant context and replicate the current study to see if same results can be achieved.

Second, the sampling method utilized in this study was a purposive method, which may need extra caution when it comes to generalizing the study results. Next, the data was collected from U.S. participants only. Future study may conduct an international study and compare the findings across different countries and culture to provide better information for restaurant operators and SST companies in term of strategic planning and marketing. Moreover, a comparison of the current findings across different generations (i.e. Gen Y vs. Gen Z) would be a fruitful area for future research that will enhance current knowledge on SSTs evaluations for industry professional and scholars. This study focuses on the restaurant industry; thus, enriching the current research by examining consumer perception of SSTs in other sectors (i.e. hotels, airlines, travel service, airport services, car rentals, theme parks, cruise line vacations, etc.) will benefit both practitioners and scholars.

Third, this study utilized the quantitative research method only, which may be unable to capture the entire consumer perspectives on the SST use experience. To provide a better understanding for the restaurant customer SSTs experience, an incorporation of qualitative and quantitative research design will contribute to this research area significantly. Furthermore, this study examines the restaurant customer's perception of the current experience with SSTs; however, a fruitful area for future research is to examine the impact watching other customers (live experience/ value) during the service delivery process on potential SSTs users who never thought to use the SST platforms before.

Fourth, this study enhances our understanding by exploring the SSTs values that provide an exceptional SST experience. Future research is encouraged to examine why some customers

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do not use SSTs and prefer to interact with service encounter employees. Additionally, future research should examine the negative side of utilizing SSTs from the consumer perspectives. For instance, many SST users reported service failure during the interaction with the SST. As a result, examining SST service failure and its impact on customer continuance intention would provide useful information to both academia and the industry. Another potential research area that may benefit the industry is to examine the financial performance of implementing SSTs and see if these platforms are worth the investment.

Fifth, this study includes four types of SSTs in the model, which enhance the current knowledge in the SST context. However, we evaluate restaurant proprietary SSTs only. Future studies may want to look at other third-party SST platforms that restaurants utilize to maximize their market presence. Furthermore, the comparison of the SSTs in the current study was conducted without categorization. Future studies may consider categorizing SSTs into public use SSTs (i.e. kiosk, and tabletop) and private use SSTs (i.e. mobile apps and website). This comparison will provide important information to restaurateurs regarding the efficiency of each SST category. Another limitation of the current study is related to the context of the study. Future research is encouraged to examine multiple types of SSTs across multiple industries to enhance the generalizability of the current study findings.

Sixth, this study examines the outcome effect of SSTs value on restaurant consumer continuance intention. Future studies should look at the impact of SSTs experience on restaurant brand loyalty. The impact of word-of- mouth generated from current customers who used SSTs is another avenue for future research to discover. Another area for future research would be by incorporating additional factors that may motivate the restaurant customer to utilize SSTs, such as the impact of happy hours, promotions, and rewards points. Moreover, future studies are also

encouraged to include more moderation relationships into the current model (i.e. habit, technology anxiety, trust, switching cost, number of items per order) to see if they influence restaurant customer continuance intention. Last, but not least, future research is encouraged to examine the moderation effects of the target market sociodemographic characteristics such as gender, age, education, and income to see if they have an influence on SSTs continuance intention.

Chapter Summary

This chapter provided a summary of the findings along with a discussion of the results and their relationship to the current literature. Next, the theoretical and the managerial implications of the findings were discussed. The final section discusses the study limitation and proposed direction for future research agenda.

APPENDIX A: PLS-SEM SST MODELS RESULTS

General Model
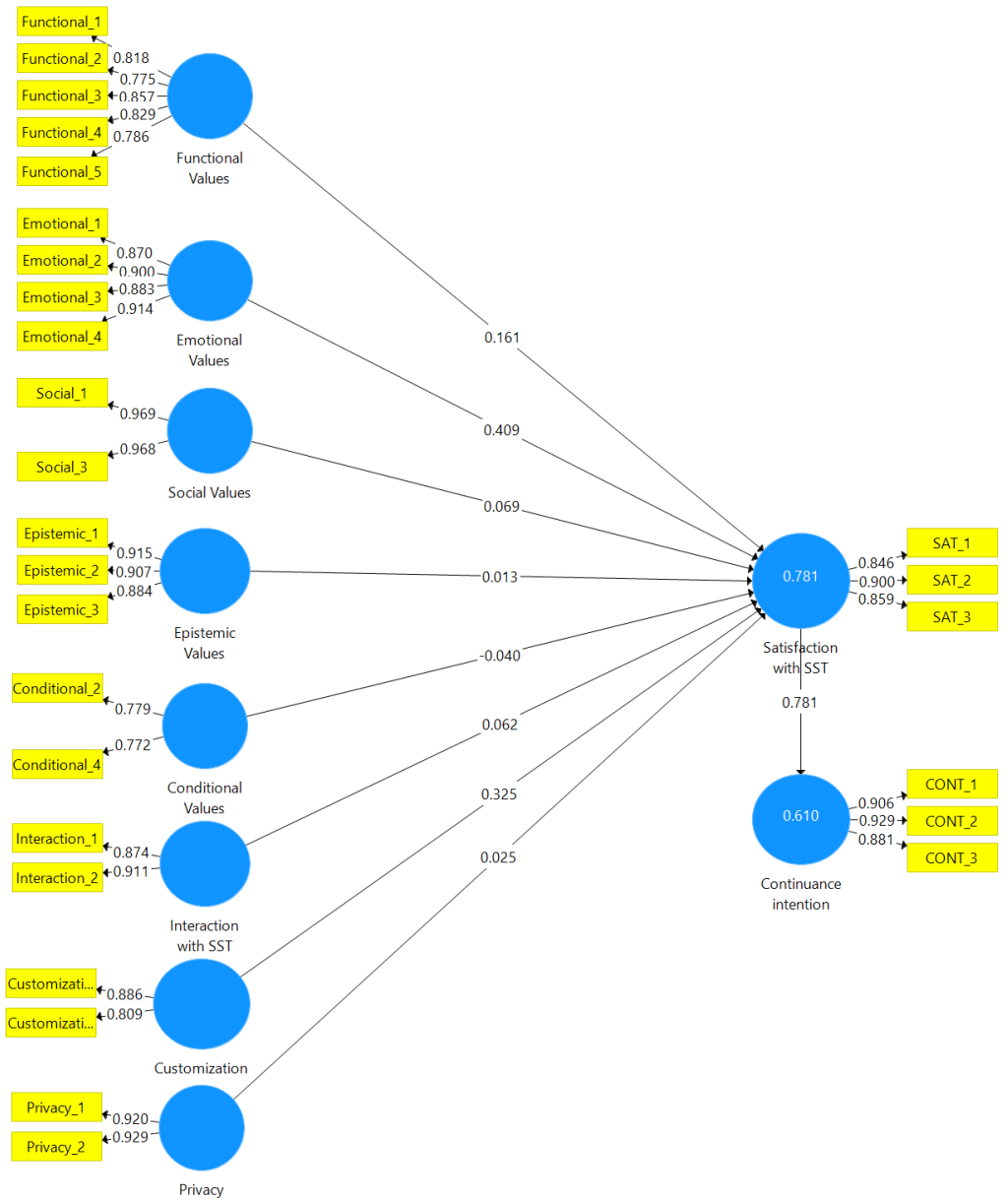
Kiosk Model
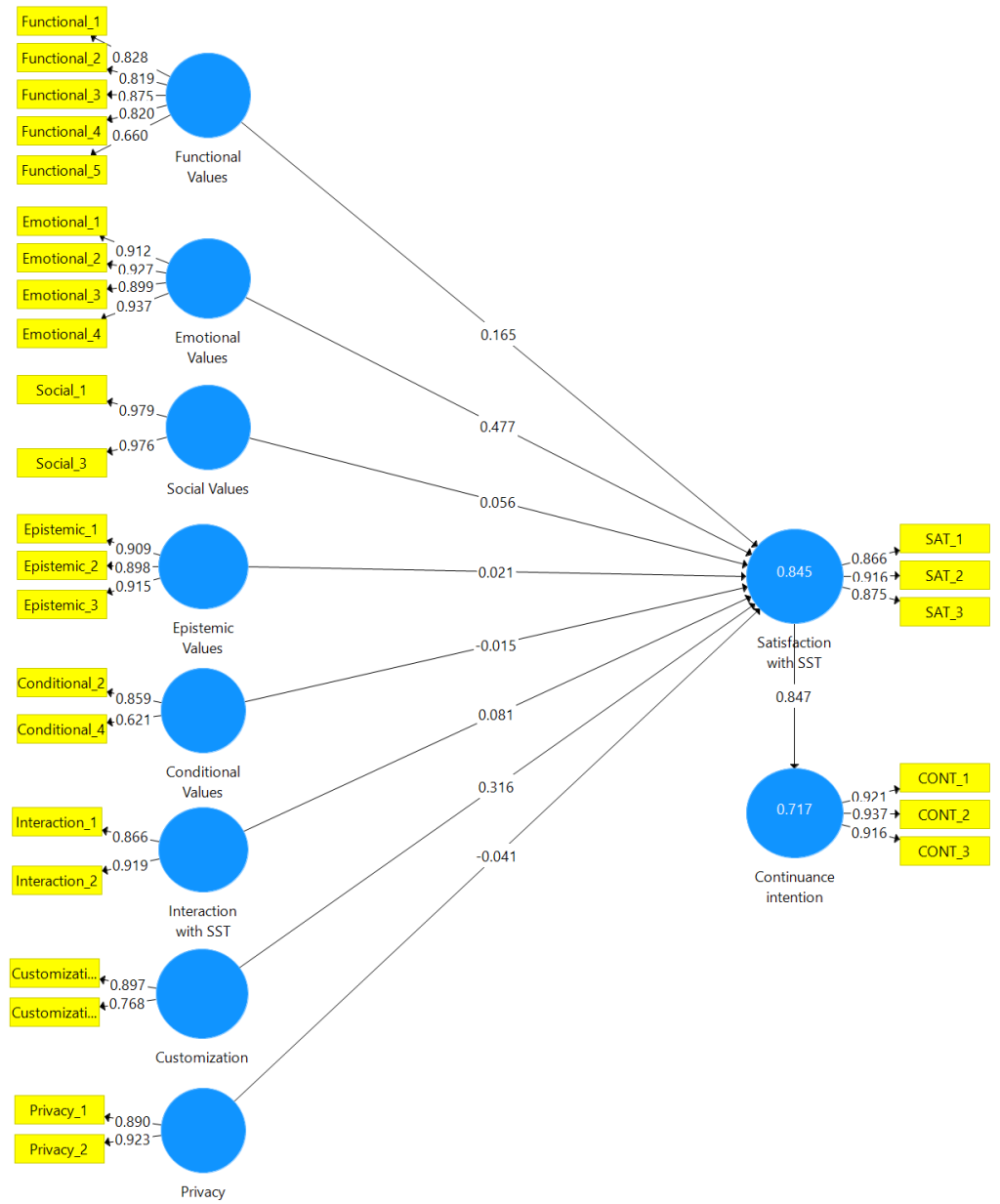
Tabletop Model
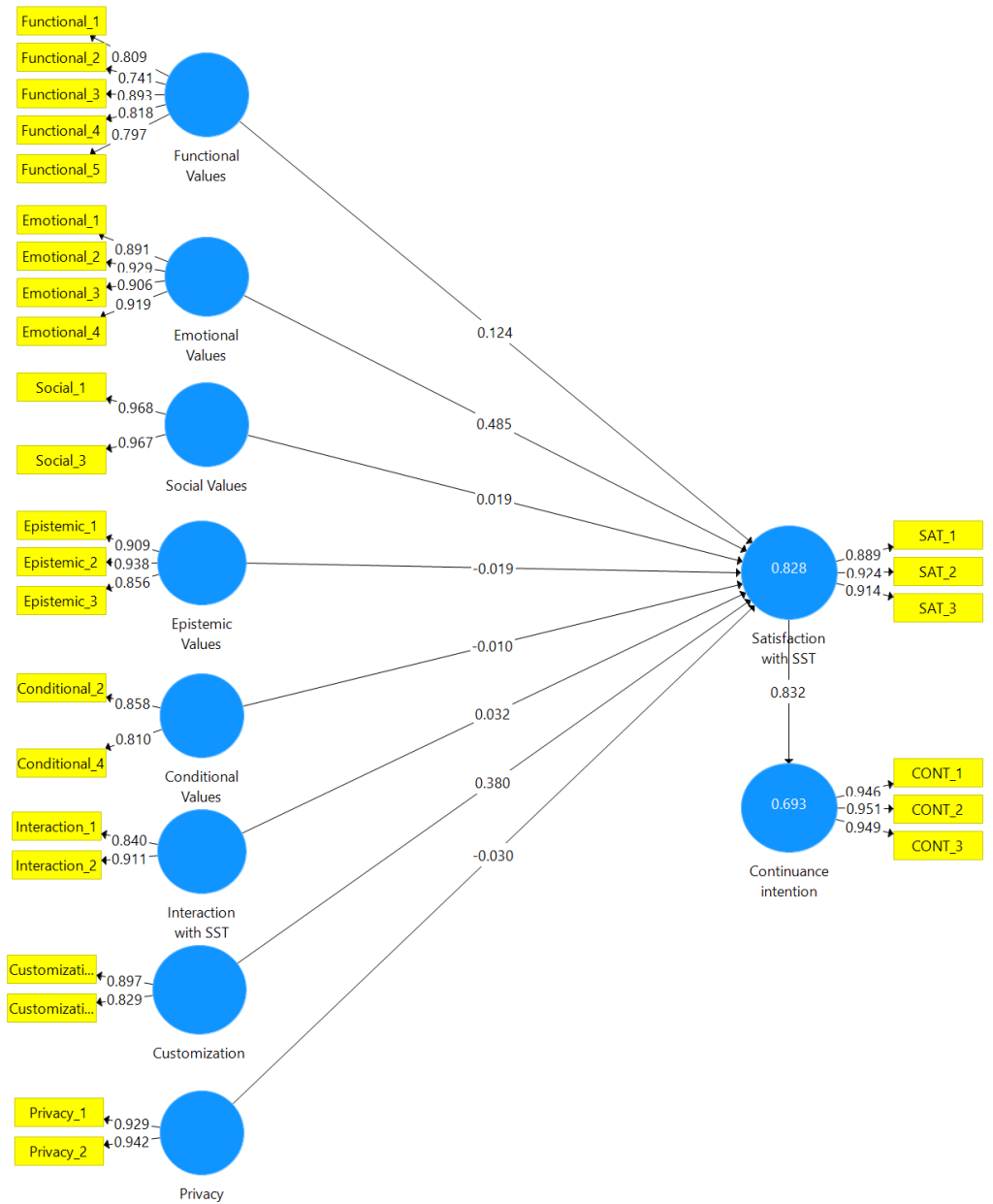
Mobile App Model
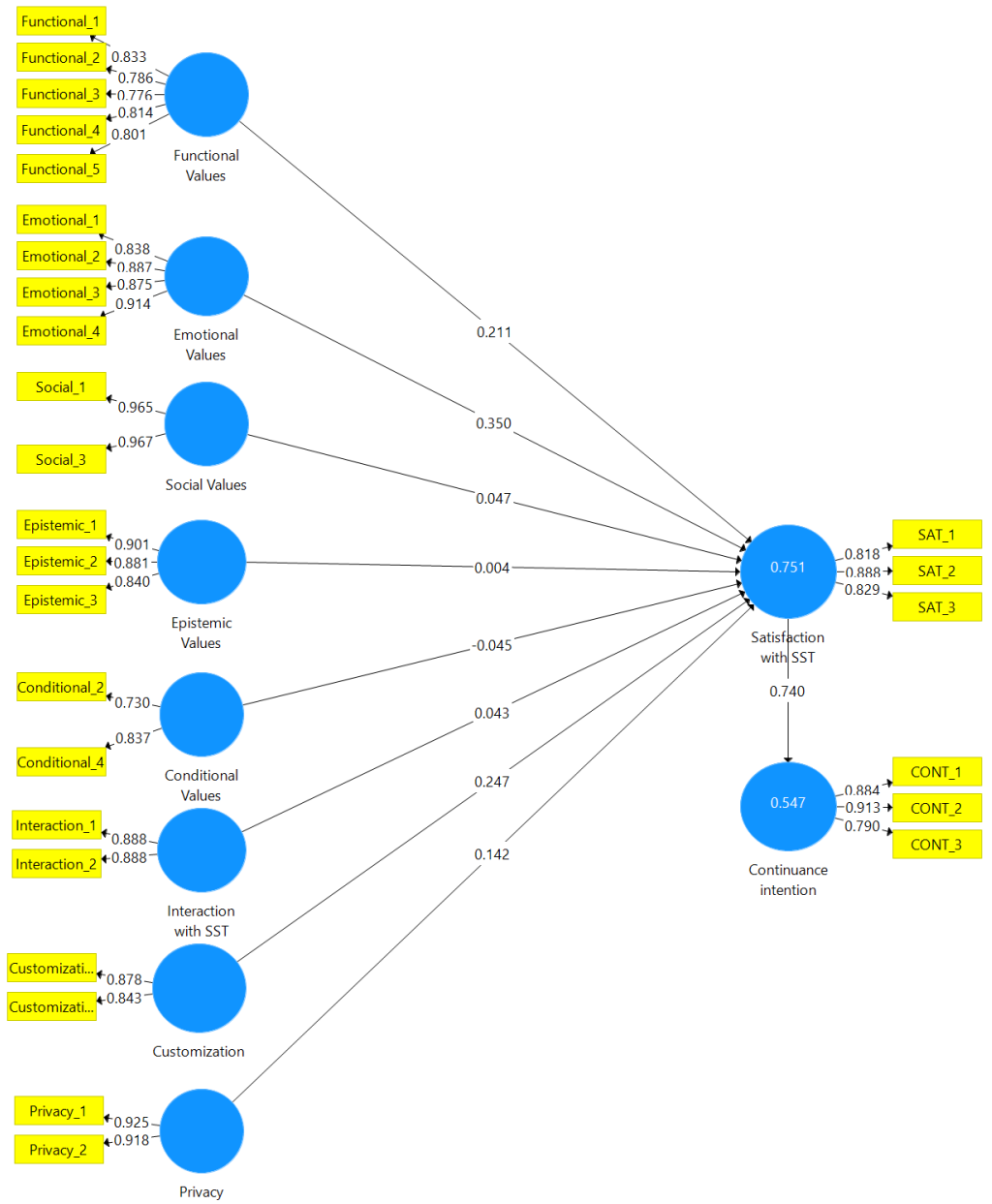
Website Model
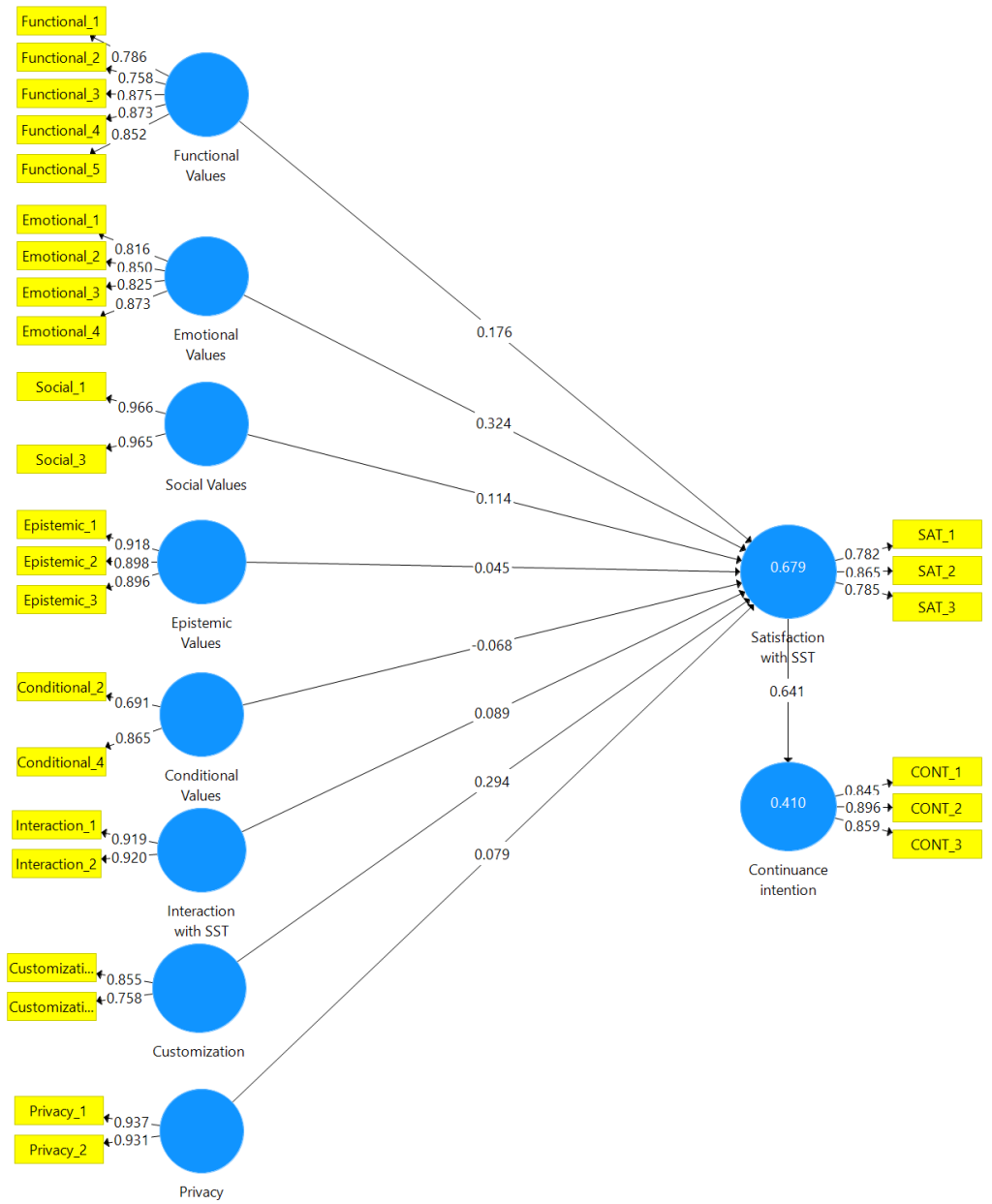
APPENDIX B: IRB APPROVAL LETTER

UNIVERSITY OF CENTRAL FLORIDA

<u>EXEMPTION DETERMINATION</u>

May 15, 2019

Dear Motaz Zaitouni:

On 4/23/2019, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Exempt Category
Title:	A comparison of self-service technologies (SSTs) in the U.S. restaurant industry: An evaluation of consumer perceived value, satisfaction and behavioral intentions
Investigator:	Motaz Zaitouni
IRB ID:	STUDY00000429
Funding:	None
Grant ID:	None

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Adrienne Showman
Designated Reviewer

APPENDIX C: KIOSK SURVEY INSTRUMENT

Introduction

"Cover Letter"

Dear Participants,

The data collected for this project will be used to understand how customers evaluate their most recent experience using restaurant self-service technologies (SSTs). SSTs are defined as "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al. 2000, p. 50). The results of this study will contribute significantly to the restaurant operations and improve restaurant customer experience.

The participants in this survey should be 18 years or older and have previously used/experienced restaurant kiosk within the past three months. Your participation in this survey is voluntary, and your response will be kept anonymous and confidential. You have the right to not complete the survey at any time without consequence. The survey will take about 8 ~ 10 minutes to complete. Your response will be used for academic research only. The compensation to you for your participation in this survey is $0.35 which is managed by MTurk, and is rewarded only when the survey is 100% completed.

Please note that the data you provide may be collected and used by Amazon as per its privacy agreement. This agreement shall be interpreted according to United States law.

Once again, we appreciate your time. Your participation in this study is critical to the success of this research. If you have any questions, concerns, report a problem, or need more information about this survey please contact: Dr. Kevin Murphy or Motaz Zaitouni.

Study contact for questions about the study or to report a problem: Dr. Kevin Murphy, Professor, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida, (407) 903-8035 , or by email at: Kevin.Murphy@ucf.edu. Mr. Motaz Zaitouni, Ph.D. Candidate, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida , (407) 903-8252, or by email at: motaz@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

Thank you in advance for completing the study survey!

I have read the study information and I agree to participate in this study

Agree
Disagree

Are you 18 years of age or older?

Yes
No

Have you used a **kiosk** to order at a restaurant **within the past 3 months?**

Yes
No

SST experience general info

Please recall your **most recent experience** using **restaurant kiosk** and **answer the following questions related to this recalled experience.**

What is the **name of the restaurant** that you used its kiosk?

[   ]

How would you classify **${q://QID46/ChoiceTextEntryValue} restaurant**?

Quick Service Restaurant/ Fast Food (such as: Subway, McDonald's, Pizza Hut)
Fast Casual Restaurant (such as: Shake Shack, Panera Bread, Five Guys)
Casual Dining Restaurant (such as: Applebees, TGI Fridays, OUTBACK)
Coffee Shop (such as: Starbucks, Dunkin' Donuts)
[   ] Other, please specify

What did you order when you used **${q://QID46/ChoiceTextEntryValue} kiosk** in your **most recent experience?**

Breakfast
Lunch
Dinner
[   ] Other

170

Were you accompanied with other people?

Yes
No

Who was/were with you? (e.g. Spouse, friends, family members, etc.)

Spouse
Friends
Business colleagues
Family members (including kids)
[   ] Others, please specify

SST Values

The following questions seek to explore your opinion about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} kiosk.**

Please indicate to what extent do you agree with the following statements related to your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant kiosk allows me to have my order quickly	○	○	○	○	○	○	○
Using this restaurant kiosk requires little effort	○	○	○	○	○	○	○
Using this restaurant kiosk makes my food ordering process easier and smoother	○	○	○	○	○	○	○
The process and the instructions of using this restaurant kiosk were clear	○	○	○	○	○	○	○
Each function of this restaurant kiosk was error-free	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I enjoyed using this restaurant kiosk	○	○	○	○	○	○	○
Using this restaurant kiosk gives me pleasure	○	○	○	○	○	○	○
I feel relaxed while using this restaurant kiosk	○	○	○	○	○	○	○
Using this restaurant kiosk makes me feel good	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your perception regarding your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant kiosk helps me feel accepted by others	○	○	○	○	○	○	○
Using this restaurant kiosk helps me make a good impression on other people	○	○	○	○	○	○	○
Using this restaurant kiosk gives me social approval	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I used this restaurant kiosk to try new ways of meal ordering	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I used this restaurant kiosk to test the new technology	○	○	○	○	○	○	○
I used this restaurant kiosk out of curiosity	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Restaurant kiosk was the only option/choice available to order at this restaurant	○	○	○	○	○	○	○
Restaurant kiosk has no waiting time when I am in a hurry or have limited time	○	○	○	○	○	○	○
There is a long queue in the restaurant order counter, so I use the restaurant kiosk	○	○	○	○	○	○	○
If I use this restaurant kiosk, I can use promotional code, discounts, or reward points for redemption	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to your interaction with **${q://QID46/ChoiceTextEntryValue} kiosk** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant kiosk provided me an interactive experience.	○	○	○	○	○	○	○
I felt I had control over my interaction when using this restaurant kiosk	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The restaurant kiosk meets my specific need	○	○	○	○	○	○	○
The restaurant kiosk has features that are personalized for me	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My personal information is treated confidentially when I use this restaurant kiosk	○	○	○	○	○	○	○
I feel safe in my transactions when I use this restaurant kiosk	○	○	○	○	○	○	○

Attention Check

If you are paying attention, please select "Extremely happy"

Extremely happy

Neutral

Sad

SST experience outcomes

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Overall, I am satisfied with the kiosk offered by this restaurant	○	○	○	○	○	○	○
The kiosk offered by this restaurant exceeds my expectations	○	○	○	○	○	○	○
The kiosk offered by this restaurant is close to my favorite self-service technology	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your future intention to continue **using ${q://QID46/ChoiceTextEntryValue} kiosk** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I intend to continue using this restaurant kiosk in the future	○	○	○	○	○	○	○
I will continue using this restaurant kiosk in the future	○	○	○	○	○	○	○
I will regularly use this restaurant kiosk	○	○	○	○	○	○	○

SST overall & frequencies

Overall, how do you describe your **most recent experience using ${q://QID46/ChoiceTextEntryValue} kiosk**?

Neutral

Negative

Positive

In the past week, how many times did you **use ${q://QID46/ChoiceTextEntryValue} kiosk**?

\# of times ⬚

On average, how often do you eat out?

Daily

4-6 times a week

2-3 times a week

Once a week

⬚ Other, please specify

Sociodemographic questions

What is your gender?

Male

Female

What is your age?

18 - 24

25 - 34

35 - 44

45 - 54

55 - 64

65 - 74

75 - 84

85 or older

What is your current marital status?

Never married

Separated

Divorced

Widowed

Married - with kids

Married - with no kids

⬚ Other

What is your highest level of education completed?

High school graduate

Some college but not degree

College degree

Master degree

Doctoral degree

What is your primary occupational status?

Employed full time

Employed part time

Unemployed looking for work

Unemployed not looking for work

Retired

Student

Please indicate, what is your annual household income before taxes?

Less than $10,000

$10,000 - $19,999

$20,000 - $29,999

$30,000 - $39,999

$40,000 - $49,999

$50,000 - $59,999

$60,000 - $69,999

$70,000 - $79,999

$80,000 - $89,999

$90,000 - $99,999

$100,000 - $149,999

More than $150,000

In which state or U.S. territory do you currently live?

| ▲▼ |

Random ID

Your survey **code** is ${e://Field/Random%20ID}

In order to receive the credit for completing the survey. Please copy this code and paste it into MTurk system.

When you have copied this code, please CLICK on the NEXT button to submit the survey.

Powered by Qualtrics

APPENDIX D: TABLETOP SURVEY INSTRUMENT

Introduction

"Cover Letter"

Dear Participants,

The data collected for this project will be used to understand why consumers choose self-service technologies (SSTs) platforms in a restaurant settings, and how they evaluate their most recent experience using restaurant self-service technologies (SSTs).

SSTs are defined as "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al. 2000, p. 50). The results of this study will contribute significantly to the restaurant operations and improve customer experience.

The participants in this survey should be 18 years or older and have **previously used/experienced restaurant tabletop tablet within the past three months**. Your participation in this survey is voluntary, and your response will be kept anonymous and confidential. You have the right to not complete the survey at any time without consequence. The survey will take about 8 ~ 10 minutes to complete. Your responses will be used for academic research only. The compensation to you for your participation in this survey is $0.35 which is managed by MTurk, and is rewarded only when the survey is 100% completed.

Please note that the data you provide may be collected and used by Amazon as per its privacy agreement. This agreement shall be interpreted according to United States law.

Once again, we appreciate your time and your participation in this study is critical to the success of this research. If you have any question, concerns, report a problem, or need more information about this survey please contact: Dr. Kevin Murphy or Motaz Zaitouni.

Study contact for questions about the study or to report a problem: Dr. Kevin Murphy, Professor, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida, (407) 903-8035 , or by email at: Kevin.Murphy@ucf.edu. Mr. Motaz Zaitouni, Ph.D. Candidate, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida , (407) 903-8252, or by email at: motaz@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

Thank you in advance for completing the study survey!

I have read the study information and I agree to participate in this study

Agree
Disagree

Are you 18 years of age or older?

No
Yes

Have you used a restaurant tabletop tablet within the past 3 months?

No
Yes
Maybe

SST experience general info

Please recall your **most recent experience** using **restaurant tabletop tablet** and **answer the following questions related to this recalled experience.**

What is the **name of the restaurant** that you used its tabletop tablet?

[   ]

How would you classify **${q://QID46/ChoiceTextEntryValue}** restaurant?

Quick Service Restaurant/ Fast Food (such as: Subway, McDonald's, Pizza Hut)
Fast Casual Restaurant (such as: Shake Shack, Panera Bread, Five Guys)
Casual Dining Restaurant (such as: Applebees, TGI Fridays, OUTBACK)
Coffee Shop (such as: Starbucks, Dunkin' Donuts)
[   ] Other, please specify

What did you order when you used **${q://QID46/ChoiceTextEntryValue} tabletop tablet** in your **most recent experience?**

Breakfast
Lunch
Dinner
[   ] Other

Were you accompanied with other people?

Yes
No

Who was/were with you? (e.g. Spouse, friends, family members, etc.)

Spouse
Friends
Business colleagues
Family members (including kids)
[   ] Others, please specify

SST Values

The following questions seek to explore your opinion about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

Please indicate to what extent do you agree with the following statements related to your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant tabletop tablet allows me to have my order quickly	○	○	○	○	○	○	○
Using this restaurant tabletop tablet requires little effort	○	○	○	○	○	○	○
Using this restaurant tabletop tablet makes my food ordering process easier and smoother	○	○	○	○	○	○	○
The process and the instructions of using this restaurant tabletop tablet were clear	○	○	○	○	○	○	○
Each function of this restaurant tabletop tablet was error-free	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I enjoyed using this restaurant tabletop tablet	○	○	○	○	○	○	○
Using this restaurant tabletop tablet gives me pleasure	○	○	○	○	○	○	○
I feel relaxed while using this restaurant tabletop tablet	○	○	○	○	○	○	○
Using this restaurant tabletop tablet makes me feel good	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your perception regarding your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant tabletop tablet helps me feel accepted by others	○	○	○	○	○	○	○
Using this restaurant tabletop tablet helps me make a good impression on other people	○	○	○	○	○	○	○
Using this restaurant tabletop tablet gives me social approval	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to attitude toward **using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I used this restaurant tabletop tablet to try new ways of meal ordering	○	○	○	○	○	○	○
I used this restaurant tabletop tablet to test the new technology	○	○	○	○	○	○	○
I used this restaurant tabletop tablet out of curiosity	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Tabletop tablet was the only option/choice available to order food at this restaurant	○	○	○	○	○	○	○
Using the restaurant tabletop tablet has no waiting time when I am in a hurry or have limited time	○	○	○	○	○	○	○
Waiting for waiter to take my order takes longer time that using tabletop tablet	○	○	○	○	○	○	○
If I use this restaurant tabletop tablet, I can use promotional code, discounts, or reward points for redemption	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to your interaction with **${q://QID46/ChoiceTextEntryValue} tabletop tablet** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant tabletop tablet provided me an interactive experience.	○	○	○	○	○	○	○
I felt I had control over my interaction when using this restaurant tabletop tablet	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The restaurant tabletop tablet meets my specific needs	○	○	○	○	○	○	○
The restaurant tabletop tablet has features that are personalized for me	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My personal information is treated confidentially when I use this restaurant tabletop tablet	○	○	○	○	○	○	○
I feel safe in my transactions when I use this restaurant tabletop tablet	○	○	○	○	○	○	○

Attention Check

If you are paying attention, please select "Extremely happy"

Extremely happy

Neutral

Sad

SST experience outcomes

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Overall, I am satisfied with the tabletop tablet offered by this restaurant	○	○	○	○	○	○	○
The tabletop tablet offered by this restaurant exceeds my expectations	○	○	○	○	○	○	○
The tabletop tablet offered by this restaurant is close to my favorite self-service technology	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your future intention to continue **using ${q://QID46/ChoiceTextEntryValue} tabletop tablet**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I intend to continue using this restaurant tabletop tablet in the future	○	○	○	○	○	○	○
I will continue using this restaurant tabletop tablet in the future	○	○	○	○	○	○	○
I will regularly use this restaurant tabletop tablet	○	○	○	○	○	○	○

SST overall & frequencies

Overall, how do you describe your **most recent experience** using
${q://QID46/ChoiceTextEntryValue} tabletop tablet?

Negative
Neutral
Positive

In the past week, how many times did you use **${q://QID46/ChoiceTextEntryValue}
tabletop tablet**?

# of times

On average, how often do you eat out?

Daily
4-6 times a week
2-3 times a week
Once a week
Other, please specify

Sociodemographic questions

What is your gender?

Male
Female

What is your age?

18 - 24
25 - 34
35 - 44
45 - 54
55 - 64
65 - 74
75 - 84
85 or older

What is your current marital status?

Never married
Separated
Divorced
Widowed
Married - with kids
Married - with no kids
Other

What is your highest level of education completed?

High school graduate
Some college but not degree
College degree
Master degree
Doctoral degree

What is your primary occupational status?

Employed full time
Employed part time
Unemployed looking for work
Unemployed not looking for work
Retired
Student

Please indicate, what is your annual household income before taxes?

Less than $10,000
$10,000 - $19,999
$20,000 - $29,999
$30,000 - $39,999
$40,000 - $49,999
$50,000 - $59,999
$60,000 - $69,999
$70,000 - $79,999
$80,000 - $89,999
$90,000 - $99,999
$100,000 - $149,999
More than $150,000

In which state or U.S. territory do you currently live?

Your survey **code** is ${e://Field/Random%20ID}

In order to receive the credit for completing the survey. Please copy this code and paste it into MTurk system.

When you have copied this code, please CLICK on the NEXT button to submit the survey.

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APPENDIX E: MOBILE APP SURVEY INSTRUMENT

Introduction

<p style="text-align:center">"Cover Letter"</p>

Dear Participants,

    The data collected for this project will be used to understand why consumers choose self-service technologies (SSTs) platforms in a restaurant settings, and how they evaluate their most recent experience using restaurant self-service technologies (SSTs).

SSTs are defined as "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al. 2000, p. 50). The results of this study will contribute significantly to the restaurant operations and improve customer experience.

The participants in this survey should be 18 years or older and have previously used/experienced restaurant "proprietary" branded mobile app within the past three months. Your participation in this survey is voluntary, and your response will be kept anonymous and confidential. You have the right to not complete the survey at any time without consequence. The survey will take about 8 ~ 10 minutes to complete. Your responses will be used for academic research only. The compensation to you for your participation in this survey is $0.35 which is managed by MTurk, and is rewarded only when the survey is 100% completed.

Please note that the data you provide may be collected and used by Amazon as per its privacy agreement. This agreement shall be interpreted according to United States law.

Once again, we appreciate your time and your participation in this study is critical to the success of this research. If you have any question, concerns, report a problem, or need more information about this survey please contact: Dr. Kevin Murphy or Motaz Zaitouni.

Study contact for questions about the study or to report a problem: Dr. Kevin Murphy, Professor, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida, (407) 903-8035 , or by email at: Kevin.Murphy@ucf.edu. Mr. Motaz Zaitouni, Ph.D. Candidate, Department of Hospitality Services, Rosen College of Hospitality Management, University of Central Florida , (407) 903-8252, or by email at: motaz@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

<p style="text-align:center">Thank you in advance for completing the study survey!</p>

I have read the study information and I agree to participate in this study

Agree
Disagree

Are you 18 years of age or older?

Yes
No

Have you used a **"proprietary" restaurant mobile app within the past 3 months**?

No
Yes
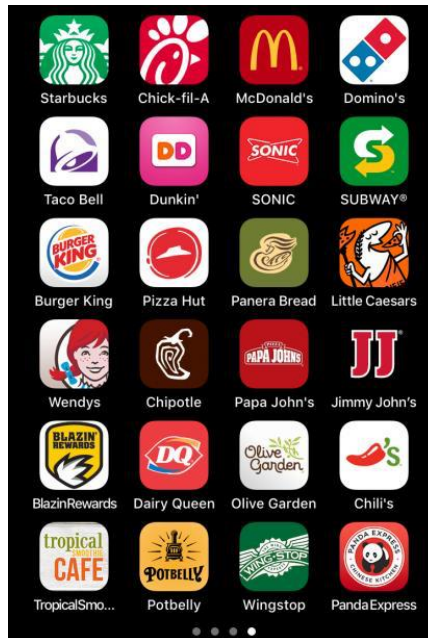
SST experience general info

Please recall your **most recent experience** using restaurant branded mobile app and **answer the following questions related to this recalled experience. Please note that** the Apps must be a restaurant app NOT a third party apps like (Grubhub, Doordash, UberEats, etc.).

What is the name of the **"proprietary" restaurant mobile app** that you used?

[   ]

How would you classify **${q://QID46/ChoiceTextEntryValue}** restaurant?

Quick Service Restaurant/ Fast Food (such as: Subway, McDonald's, Pizza Hut)
Fast Casual Restaurant (such as: Shake Shack, Panera Bread, Five Guys)

Casual Dining Restaurant (such as: Applebees, TGI Fridays, OUTBACK)

Coffee Shop (such as: Starbucks, Dunkin' Donuts)

[   ] Other, please specify

What did you order when you used **${q://QID46/ChoiceTextEntryValue} mobile app** in your **most recent experience?**

Breakfast

Lunch

Dinner

[   ] Other

Were you accompanied with other people when you used **${q://QID46/ChoiceTextEntryValue} mobile app**?

Yes

No

Who was/were with you? (e.g. Spouse, friends, family members, etc.)

Spouse

Friends

Business colleagues

Family members (including kids)

[   ] Others, please specify

SST Values

The following questions seek to explore your opinion about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

Please indicate to what extent do you agree with the following statements related to your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant mobile app allows me to have my order quickly	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant mobile app requires little effort	O	O	O	O	O	O	O
Using this restaurant mobile app makes my food ordering process easier and smoother	O	O	O	O	O	O	O
The process and the instructions of using this restaurant mobile app were clear	O	O	O	O	O	O	O
Each function of this restaurant mobile app was error-free	O	O	O	O	O	O	O

Please indicate to what extent do you agree with the following statements about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I enjoyed using this restaurant mobile app	O	O	O	O	O	O	O
Using this restaurant mobile app gives me pleasure	O	O	O	O	O	O	O
I feel relaxed while using this restaurant mobile app	O	O	O	O	O	O	O
Using this restaurant mobile app makes me feel good	O	O	O	O	O	O	O

Please indicate to what extent do you agree with the following statements about your perception regarding your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant mobile app helps me feel accepted by others	○	○	○	○	○	○	○
Using this restaurant mobile app helps me make a good impression on other people	○	○	○	○	○	○	○
Using this restaurant mobile app gives me social approval	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to attitude toward using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I used this restaurant mobile app to try new ways of meal ordering	○	○	○	○	○	○	○
I used this restaurant mobile app to test the new technology	○	○	○	○	○	○	○
I used this restaurant mobile app out of curiosity	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The mobile app was the only option/choice available to order from this restaurant	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Mobile app has no waiting time when I am in a hurry or have limited time	○	○	○	○	○	○	○
There is a long queue in the restaurant order counter, so I use the mobile app	○	○	○	○	○	○	○
If I use this restaurant mobile app, I can use promotional code, discounts, or reward points for redemption	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to your interaction with **${q://QID46/ChoiceTextEntryValue}** mobile app based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant mobile app provided me an interactive experience.	○	○	○	○	○	○	○
I felt I had control over my interaction when using this restaurant mobile app	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue}** mobile app

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The restaurant mobile app meets my specific needs	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The restaurant mobile app has features that are personalized for me	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My personal information is treated confidentially when I use this restaurant mobile app	○	○	○	○	○	○	○
I feel safe in my transactions when I use this restaurant mobile app	○	○	○	○	○	○	○

Attention Check

If you are paying attention, please select "Extremely happy"

Sad

Extremely happy

Neutral

SST experience outcomes

Please indicate to what extent do you agree with the following statements about your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} mobile app**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Overall, I am satisfied with the mobile app offered by this restaurant	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The mobile app offered by this restaurant exceeds my expectations	○	○	○	○	○	○	○
The mobile app offered by this restaurant is close to my favorite self-service technology	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your future intention to continue using **${q://QID46/ChoiceTextEntryValue} mobile app** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I intend to continue using this restaurant mobile app in the future	○	○	○	○	○	○	○
I will continue using this restaurant mobile app in the future	○	○	○	○	○	○	○
I will regularly use this restaurant mobile app	○	○	○	○	○	○	○

SST overall & frequencies

Overall, how do you describe your **most recent experience** using **${q://QID46/ChoiceTextEntryValue}** mobile app?

Positive
Neutral
Negative

How often do you use **${q://QID46/ChoiceTextEntryValue} mobile app**?

Daily
Weekly
Monthly

On average, how often do you eat out?

Daily
4-6 times a week
2-3 times a week
Once a week
[   ] Other, please specify

Sociodemographic questions

What is your gender?

Male
Female

What is your age?

18 - 24
25 - 34
35 - 44
45 - 54
55 - 64
65 - 74
75 - 84
85 or older

What is your current marital status?

Never married
Separated
Divorced
Widowed
Married - with kids
Married - with no kids
[   ] Other

What is your highest level of education completed?

High school graduate
Some college but not degree
College degree
Master degree
Doctoral degree

What is your primary occupational status?

Employed full time

Employed part time

Unemployed looking for work

Unemployed not looking for work

Retired

Student

Please indicate, what is your annual household income before taxes?

Less than $10,000

$10,000 - $19,999

$20,000 - $29,999

$30,000 - $39,999

$40,000 - $49,999

$50,000 - $59,999

$60,000 - $69,999

$70,000 - $79,999

$80,000 - $89,999

$90,000 - $99,999

$100,000 - $149,999

More than $150,000

In which state or U.S. territory do you currently live?

[▲▼]

Your survey **code** is ${e://Field/Random%20ID}

In order to receive the credit for completing the survey. Please copy this code and paste it into MTurk system.

When you have copied this code, please CLICK on the NEXT button to submit the survey.

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APPENDIX F: WEBSITE SURVEY INSTRUMENT

Introduction

I have read the study information and I agree to participate in this study

Agree
Disagree

Are you 18 years of age or older?

Yes
No

Have you used a **"proprietary" restaurant website within the past 3 months**?

No
Yes
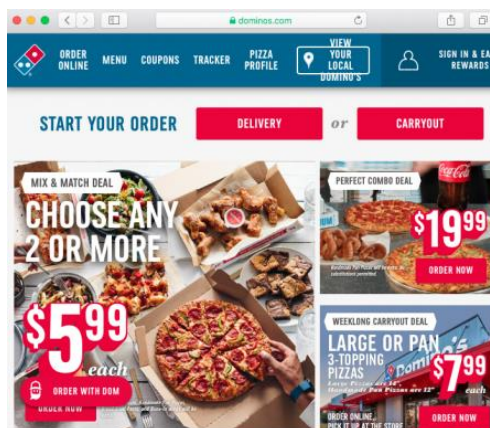
SST experience general info

Please recall your **most recent experience** using **restaurant website** and **answer the following questions related to this recalled experience**

What is the **name of the restaurant** that **you used its website**?

How would you classify **${q://QID46/ChoiceTextEntryValue} restaurant**?

Quick Service Restaurant/ Fast Food (such as: Subway, McDonald's, Pizza Hut)
Fast Casual Restaurant (such as: Shake Shack, Panera Bread, Five Guys)
Casual Dining Restaurant (such as: Applebees, TGI Fridays, OUTBACK)
Coffee Shop (such as: Starbucks, Dunkin' Donuts)
Other, please specify

What did you order when you used **${q://QID46/ChoiceTextEntryValue} website** in your recalled **most recent experience?**

Breakfast

Lunch

Dinner

[   ] Other

Were you accompanied with other people?

Yes

No

Who was/were with you? (e.g. Spouse, friends, family members, etc.)

Spouse

Friends

Business colleagues

Family members (including kids)

[   ] Others, please specify

SST Values

The following questions seek to explore your opinion about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

Please indicate to what extent do you agree with the following statements related to your recalled **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant website to order food online allows me to have my order quickly	○	○	○	○	○	○	○
Using this restaurant website to order food online requires little effort	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant website to order food online makes my food ordering process easier and smoother	○	○	○	○	○	○	○
The process and the instructions of using this restaurant website to order food online were clear	○	○	○	○	○	○	○
Each function of this restaurant website was error-free	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your recalled **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I enjoyed using this restaurant website to order food online	○	○	○	○	○	○	○
Using this restaurant website to order food online gives me pleasure	○	○	○	○	○	○	○
I feel relaxed while using this restaurant website to order food online	○	○	○	○	○	○	○
Using this restaurant website to order food online makes me feel good	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your perception regarding your **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant website to order food online helps me feel accepted by others	○	○	○	○	○	○	○
Using this restaurant website to order food online helps me make a good impression on other people	○	○	○	○	○	○	○
Using this restaurant website to order food online gives me social approval	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to attitude toward **using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I used this restaurant website to try new ways of meal ordering	○	○	○	○	○	○	○
I used this restaurant website to test the new technology	○	○	○	○	○	○	○
I used this restaurant website out of curiosity	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your recalled **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Restaurant website was the only option/choice available to order food from this restaurant	○	○	○	○	○	○	○
Restaurant online ordering has no waiting time when I am in a hurry or have limited time	○	○	○	○	○	○	○
There is a long queue in the restaurant order counters, so I use this restaurant website	○	○	○	○	○	○	○
If I use this restaurant website to order food, I can use promotional code, discounts, or reward points for redemption	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements related to your interaction with **${q://QID46/ChoiceTextEntryValue} website** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using this restaurant website provided me an interactive experience.	○	○	○	○	○	○	○
I felt I had control over my interaction when using this restaurant website	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The restaurant website meets my specific needs	○	○	○	○	○	○	○
The restaurant website has features that are personalized for me	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My personal information is treated confidentially when I use this restaurant website	○	○	○	○	○	○	○
I feel safe in my transactions when I use this restaurant website	○	○	○	○	○	○	○

Attention Check

If you are paying attention, please select "Extremely happy"

Neutral
Extremely happy
Sad

SST experience outcomes

Please indicate to what extent do you agree with the following statements about your **most recent experience using ${q://QID46/ChoiceTextEntryValue} website**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Overall, I am satisfied with this restaurant website	○	○	○	○	○	○	○
This restaurant website exceeds my expectations	○	○	○	○	○	○	○
This restaurant website is close to my favorite self-service technology	○	○	○	○	○	○	○

Please indicate to what extent do you agree with the following statements about your future intention to continue **using ${q://QID46/ChoiceTextEntryValue} website** based on your **most recent experience**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I intend to continue using this restaurant website in the future	○	○	○	○	○	○	○
I will continue using this restaurant website in the future	○	○	○	○	○	○	○
I will regularly use this restaurant website	○	○	○	○	○	○	○

SST overall & frequencies

Overall, how do you describe your **most recent experience** using **${q://QID46/ChoiceTextEntryValue} website**?

Positive
Neutral
Negative

In the past week, how many times did you use **${q://QID46/ChoiceTextEntryValue} website**?

# of times   [____]

On average, how often do you eat out?

Daily
4-6 times a week
2-3 times a week
Once a week
Never

Sociodemographic questions

What is your gender?

Male
Female

What is your age?

18 - 24
25 - 34
35 - 44
45 - 54
55 - 64
65 - 74
75 - 84
85 or older

What is your current marital status?

Never married
Separated
Divorced
Widowed
Married - with kids
Married - with no kids
[_____]Other

What is your highest level of education completed?

High school graduate
Some college but not degree
College degree
Master degree

Doctoral degree

What is your primary occupational status?

Employed full time
Employed part time
Unemployed looking for work
Unemployed not looking for work
Retired
Student

Please indicate, what is your annual household income before taxes?

Less than $10,000
$10,000 - $19,999
$20,000 - $29,999
$30,000 - $39,999
$40,000 - $49,999
$50,000 - $59,999
$60,000 - $69,999
$70,000 - $79,999
$80,000 - $89,999
$90,000 - $99,999
$100,000 - $149,999
More than $150,000

In which state or U.S. territory do you currently live?

[▼]

Your survey **code** is ${e://Field/Random%20ID}

In order to receive the credit for completing the survey. Please copy this code and paste it into MTurk system.

When you have copied this code, please CLICK on the NEXT button to submit the survey.

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