International Tourism and Hospitality Journal 4(2): 1-11 (2021)
Print ISSN: 2616-518X
Online ISSN: 2616-4701

ITHJ
International Tourism and Hospitality Journal
Journal Homepage: https://rpajournals.com/ithj

What is the Most Prominent Technology Challenge in Restaurants? An Empirical Study

Ahmed E. Baiomy
Faculty of Tourism and Hotel Management
Helwan University, Cairo, Egypt

Abstract

Technology has been installed in numerous restaurants' operations to enhance customer service. However, persuading customers to use new technologies in the restaurant business has become more challenging than before. Therefore, this study examines customers' challenges of using technology in either a quick-service or casual-dining restaurant based on a sample of 593 customers. The findings indicated that customers' lack of knowledge was the most dominant challenge for using technology in restaurants. In a casual dining restaurant, menu selection was the most perceptible challenge for using technology than in a quick-service restaurant. The findings also showed that demographic variables do not appear to influence the challenges of using technology.

Keywords: Smart devices, Quick-service restaurants, Casual-dining restaurants

Corresponding author: Ahmed E. Baiomy; E-mail: ahmadbaiomie@gmail.com
DOI: https://doi.org/10.37227/ITHJ-2021-01-42

Introduction

Without integrating advanced technologies, no business can stay competitive and relevant in today's fierce competition. In the era of artificial intelligence and machine learning, technology is evolving rapidly. The restaurant business is no exception (Collins, Cobanoglu, and Malik, 2003). Technological advancement has impacted the restaurant industry in the world. Technology has also become a principal feature in operating the restaurant industry with the prospering of the telecommunications industry and developing sophisticated software programs to support service delivery (Buhalis, 1998; Olsen and Connoloy, 2000). Restaurant operators (4 out of 5) agreed that technology is useful for their restaurants, but they agree that it makes the customer experience more complicated (NRA, 2016). Although restauranteurs have used technology to enhance their operational efficiency and productivity, i.e., point-of-sales and back-of-the-house systems, increasing customer engagement has become their top priority of today's restaurant technology (Lorden and Pant, 2016).

Customers perceive restaurants as places to experience pleasure and a sense of personal well-being (Josiam and Henry, 2014; Ryu and Han, 2011; Ariffin et al., 2012) rather than places just to eat (Finkelstein, 1989). Restaurants are businesses where

customers spend a great deal of time based on each restaurant type. Therefore, they are likely to be differently affected by the restaurant's technology (Cobanoglu and Collins, 2008; Yates, 2016). For example, Millennials are more tech-savvy, contented interacting with touchpad screens, and expect quicker service than older generations (Yates, 2016). Therefore, either quick-service or casual restaurants (e.g., KFC, Popeye's, McDonald's, etc.) were more likely to use technology due to their emphasis on service speed. Hoshmand (2018) indicated that 92% of consumers believe tech options in restaurants will become more prevalent in the future.

Recently, many quick-service and casual dining restaurant operators (e.g., McDonald's, Applebee's, Chili's, etc.) have launched iPads by switching their printed menus with iPads (National Restaurant Association, 2016). However, it is still little unknown the customers' reasons behind not using iPads inside a restaurant. Hence, this study aims to examine customers' biggest challenge of not using iPads, tablets, or computer-based-kiosks at either quick-service or casual dining restaurants. The current research will help restaurant operators be aware of those challenges, which leads to the successful adoption of iPads in restaurants.

Literature Review

Technology adoption behavior of customers plays a critical role in forming their value perception in technology (Kim *et al.,* 2017). Technological advances generally persuade customers to adopt technology in a restaurant setting due to their convenience, leading to augmented customers' value perception towards a restaurant technology. Some customers generally pay more attention to buy products efficiently and timely to accomplish their goals with a minimum of annoyance (Ryu *et al.,* 2010). However, other customers who perceive using technology as useful, easy to use, functional, fun, enjoyable are much willing to use technology in a restaurant (Magotra e*t al.,* 2018).

In the context of iPads or tablets, customers would use iPads or tablets to navigate menu choices and order food/drinks and access the photos or videos of food/drink items and inform chefs about their preferences of cooking steaks (Wang and Wu, 2013). Customers may gain several benefits from using iPads or tablets: first, the advantage of placing the orders directly to the kitchen/bar without the assistance of waiters or waitresses, which reduces customer ambiguity during the decision-making process due to informational satisfaction; second, the ability to tailor customers' orders according to their preferences. In addition, iPads or tablets allow restaurant customers to play games and to listen to music. At the same time, their meals are prepared (Ahn and Seo, 2018), which results in making the waiting time for food or drinks a more enjoyable experience for families with children. iPads help customers to call a taxi to their following destination. In this regard, Chili's has connected with Uber to offer a ride to their customers through iPads (FSR Magazine, 2015).

Regardless of all the merits of iPads, tablets, or computer-based kiosks mentioned earlier, some customers do not prefer to use iPads while dining at a restaurant. Tudoran et al. (2009) explained that expectations are the customer experiences that will result from using the product. Thus, the lower the customer expectations level about the product, the fewer the probability of them using or purchasing it (Deliza *et al.,* 1999). However, high customer expectations may motive them to use technology in a restaurant. In that regard, some customers are expected to order their meals through printed menus, mainly if they are anxious about using technology. Also, when the level of customers' experience with using technology is low, they are expected to persuade a negative emotional response.

Although technology has become an integral factor in doing business for several organizations, technology's benefits are not frequently fully recognized; remarkably, the technology proposed explicitly for use by the customer (Cobos et al., 2016). Many restaurants have implemented technology to expedite and enhance their customer service. Nevertheless, inspiring customers to use new technologies in the service environment become challenging compared to employees' use of new technologies (Curran and Meuter, 2005). Some customers may be uncomfortable with technology because they are uncertain of how problems in using technology may be resolved. Other customers do not realize the benefits of using technology and prefer to deal with people.

Methodology

An online self-administered questionnaire was developed. The questionnaire included thirteen questions. Respondents were asked if they had been to either quick service or casual dining restaurants within the preceding month. Respondents who had not dined at any casual dining restaurant within the preceding month were excluded from the study. Definition of each type of restaurant was provided for respondents in the questionnaire form. Quick service restaurants provide a limited number of food items to customers in a concise window of time. Generally, customers order their food at a counter or through a drive-through and pay for their food before consuming it (DeMicco *et al.,* 2015). *"Casual restaurants were initially created to cater to the needs and wants of the middle class who were looking to enjoy the activity of going out to eat and being served without the high price tag associated with upscale or fine dining restaurants*" (DeMicco *et al.,* 2015 p. 5).

In addition, respondents were asked if they had used a smart device before (e.g., iPhone, Android phone, iPad) or similar devices. Respondents were also asked about their frequent visits to a casual dining restaurant and the kind of meal at that restaurant. In a similar vein, respondents were asked about whom they usually go with when they dine at a casual dining restaurant. In addition, Respondents were asked if they had used any devices such as iPads, tablets, etc., provided by a restaurant to order any menu items (e.g., food, drinks).

Furthermore, respondents were asked about the biggest challenge of using iPads or tablets in a casual dining restaurant. In terms of demographics, respondents' age, gender, education level, and annual income were collected. The online questionnaire was distributed Amazon Mechanical Turk (MTurk), which is considered a reliable data source for experimental design research. A total of 593 (295 quick service; 298 casual dining) responses were used for data analysis. For data analysis, SPSS version 25 was used to analyze the data. Descriptive statistics were performed to profile the respondent demographic questions. Chi-square test was used to understand the relationship between different kinds of variables and the biggest challenge for using iPads or tablets in a casual dining restaurant.

Results and Discussion

Customers' Biggest Challenge of Using Technology in a Restaurant

Respondents were asked about their biggest challenge for using iPads, tablets, or computer-based kiosks in a restaurant (see Table 1). Customers have given five answers to choose lack of knowledge, menu selection, choosing a meal, payment options, and others. As shown in Table 1, customers had selected lack of knowledge (33.4%) as the biggest challenge for using technology in a restaurant, followed by payment options (17.9%), choosing a meal (17.4%), and menu selection (14.2%).

In addition, customers who had selected "other" as their answers have specified detailed descriptions of their responses (see Table 2). The researcher classified those responses into eight categories: consistency and data security, the system of ipads, tablets, computer-based kiosks, human interaction, relaxation, customization, unemployment rate, cleanliness, menu design, and layout. Because a choice is obtainable, Meuter *et al.* (2003) explained that customers would not adopt self-service technology options unless they feel comfortable with the technology. Although technology has become an integral factor in doing business for several organizations, technology's benefits are not continually fully recognized; remarkably, technology is proposed explicitly for customers (Cobos *et al.,* 2016).

Table 1: The biggest Challenge for using tablets or computer-based kiosks in a restaurant

	Frequency	Percentage
1 Lack of knowledge	198	33.4
2 Choosing a meal	103	17.4
3 Menu selection	84	14.2
4 Payment options	106	17.9
5 Other, please specify	102	17.2
Total	593	100.0

Table 2: The "Other" Biggest Challenge for Using Technology in Restaurants

Data Security • Credit or debit card information could be stolen. • Personal information would be shared with other agencies.	**Technical issues** • Slow servers and responsiveness of the device. • Ineffective system because they are low-cost tablets. • Network and technical issues.
Human Interaction • Lack of human interaction • Coupon redemption. "I am not getting discounts that a waiter or waitress may be able to give to me." • "I often have questions about ingredients; therefore, I would rather talk to a person about it." • These smart devices only should be for ordering take-out.	**Relaxation** • "I want a meal out with the family to relax, not be caught up in more technology." • "It would distract me from my meal. I do not even like to have my phone out when I am eating. I prefer to enjoy food without distractions". • "We usually dine with kids in these types of restaurants, so it would be time-consuming to enter multiple orders - plus, what if the restaurant is out of an item, or you wanted to make a substitution."
Customization • Describe unusual preferences like a plain burger or sandwich that is meat only. • Customize the meal or special requests/substitutions, such as lettuce tomato ketchup only on a burger.	**Unemployment Rate** • Displacement of restaurant personnel. • Kiosks take jobs away from people who would otherwise be working. • Know that people's jobs are being taken away by machines. • Guilt over the fact that this would be contributing to a trend that puts food service employees out of business.
Cleanliness • Be afraid of picking up germs from the other customers. • The tablets or iPads seem dirty or greasy; thus, no one ever wants to touch them. "I will take the time to clean it if I have my kids with me so they can play the games, but otherwise, I will not generally bother."	**Menu design and layout** • Lack of menu options and complicated layouts. • "My comfort would be refined; waiting behind people with less comfort, who will not read the screen or follow directions, is supremely annoying." • User unfriendly Interface.

In order to understand the interpretation of the findings above, a breakdown of the biggest challenge for using iPads, tablets, or computer-based kiosks by type of restaurant was performed (see Table 4). In a quick-service restaurant, the findings revealed that 34.2% of customers had chosen the lack of knowledge as the more significant challenge for using technology, followed by choosing a meal (18.3%) and payment options (18%). In a casual dining restaurant, menu selection (16.4%) was the most perceptible challenge for using technology than customers (11.9%) in a quick-service restaurant. That was an expected

result because casual restaurants usually offer an extensive al a carte menu compared to fast-food restaurants that offer limited menu content.

Table 3: A cross-tabulation of customers' biggest challenge for using technology by type of restaurant.

		Challenges for using technology					Chi-Square	Phi Value	P-value
		LK	CM	MS	PO	Other			
Restaurant type	Quick service	34.2 %	18.3 %	11.9 %	18%	17.6 %	2.681	.067	.613
	Casual dining	32.6 %	16.4 %	16.4 %	17.8 %	16.8 %			

Note LK=lack of knowledge, CM= choosing a meal, MS=menu selection, and PO=payment options.

Type of Meal

Regarding the type of meal that customers had at that specific occasion, the evidence suggested that most respondents (48.4%) used technology at a restaurant during lunch and dinner (45%). In order to understand the interpretation of these findings, a breakdown of challenges for technology by the type of meal and type of restaurant was performed (see Table 4).

Table 4: Type of meal

	Frequency	Percentage
1 Breakfast	36	6.1
2 Lunch	287	48.4
3 Dinner	267	45.0
4 No meal, just-drinks	3	0.5
Total	593	100.0

Interestingly, the customers' lack of knowledge was the dominant biggest challenge for using technology across the three meals and drinks in a restaurant (see Table 5). During breakfast, customers had placed menu selection (16.7%) as the second biggest challenge for using technology in a restaurant. During lunchtime, payment options (19.2%) and choosing a meal (18.5%) were the second and third biggest challenges for using iPads, tablets, or computer-based kiosks. During dinner, the findings indicated that payment options (17.6%) and choosing a meal (17.2%) were the second and third biggest customers' challenges for using technology.

Table 5 : A cross-tabulation of customers' biggest challenge for using technology by type of meal.

Type of meal	Challenges for using technology				
	Lack of knowledge	Choosing a meal	Menu selection	Payment options	Other
Breakfast	30.6%	11.1%	16.7%	11.1%	30.6%
Lunch	32.1%	18.5%	13.6%	19.2%	16.7%
Dinner	34.8%	17.2%	14.6%	17.6%	15.7%
No meal, drinks	66.7%	0.0%	0.0%	0.0%	33.3%

Customers' Number of Visits to a Restaurant

Respondents were asked about their number of times they had dined out at a restaurant. Most customers (41.8%) had dined out at a restaurant 1 to 3 times a month (see Table 6). The findings indicated that 25% of respondents had dined out at a restaurant once a week.

Table 6: Number of customers' visits to a restaurant

	Frequency	Percentage
Less than once a month	71	12.0
1-3 times a month	248	41.8
Once a week	148	25.0
2-3 times a week	107	18.0
4-5 times a week	17	2.9
More than five times a week	2	0.3
Total	593	100.0

The chi-square test findings indicated a significant relationship between customers' number of visits to a restaurant by the type of restaurant (see Table 7). Chi-square = 13.390, P-value = .001 (see Table 8). Predictably, customers had visited quick-service restaurants weekly more often than casual dining restaurants. However, most respondents (47.3%) had dined 1 to 3 times a month at a casual dining restaurant, compared to respondents (36.3%) who had dined at a quick-service restaurant.

Table 7: A cross-tabulation of customers' number of visits to a restaurant by the type of restaurant.

		Challenges for using technology						Chi-Square	P-value
		Less than once a month	1-3 a month	One a week	2-3 times a week	4-5 time a week	More than five times a week		
Restaurant type	Quick service	11.2%	36.3%	25.8%	22.7%	3.7%	0.3%	13.390	.001
	Casual dining	12.8%	47.3%	24.2%	13.4%	2.0%	0.3%		

Based on the results of Chi-square, there was a significant relationship (Chi-square = 13.390, P-value = .025) between customers' biggest challenge for using technology in a restaurant and the number of times they visited that restaurant. Not surprisingly, customers who visit a restaurant more frequently become more familiar with the restaurant menu and payment options. Customers would like to see more computer-based kiosks in restaurants, and 20% of millennials do not even like interacting with a cashier at checkout (Hoshmand, 2020). As shown in Table 8, customers' lack of knowledge has been dramatically reduced from 38% to 0% based on the number of visits to a restaurant. The findings indicated that the percentage of lack of knowledge (38%) is high among respondents who had dined at a restaurant less than once a month, compared to 0% of lack of knowledge for who had visited a restaurant more than five times a week. Interestingly, choosing a meal (47.1%) is the biggest challenge for using technology for customers who had dined 4 to 5 times a week.

Table 8: A cross-tabulation of customers' biggest challenge for using technology by frequency visits.

Frequency visits	Challenges for Using Technology					Chi-square	P-value
	Lack of knowledge	Choosing a meal	Menu selection	Payment options	Other		
Less than once a month	38%	12.7%	12.7%	18.3%	18.3%	34.17	.025
2-3 times a month	35.1%	13.7%	15.3%	19.8%	16.1%		
Once a week	32.4%	23%	13.5%	19.6%	11.5%		
2-3 times a week	29%	16.8%	15%	12.1%	27.1%		
4-5 times a week	17.6%	47.1%	5.9%	11.8%	17.6%		
More than five times a week.	0.0%	0.0%	0.0%	0.0%	100%		

Profiles of the Sample

The profiles of the sample are presented in Table 9. Respondents were 49.4% male and 60.6% female. Regarding age, 12.3% of the respondents were 18-24 years old, 45.4% were 25–34 years old, 24.6% were 35–44, and 7.6 % were 55 years old and over. A majority (75.2%) of respondents were Caucasian/white. Most respondents (43.5%) were highly educated, holding a 4-year degree. In terms of income, 23.9% of the respondents earned between $20,000-$39,999, and 21.4% earned $40,000-$59,999 last year. Most respondents (36.9%) were singles, and 34.1% were married with children. All respondents had used a smart device before (e.g., iPhone, Android phone, iPad) or similar devices. Regarding the type of a restaurant, 49.7% of respondent had been to a quick-service restaurant, compared to 50.3% of respondents had dined at a casual dining restaurant. In addition, customers were asked about who they usually dine with at a restaurant. The findings indicated that most customers (64.4%) go with their families when they dine at a restaurant, followed by 26% of respondents go with their friends to have a meal in a restaurant.

Table 9. Respondents' Demographics

Characteristics	Frequency	Percentage (%)
Gender		
Male	293	49.4
Female	300	50.6
Age		
18-24 years old	73	12.3
25-34 years old	269	45.4
35-44 years old	146	24.6
45-54years old	60	10.1
55 years old and over	45	7.6
Ethnic Background		
Caucasian/White	446	75.2
African American/Black	40	6.7
Hispanic/Latino	34	5.7
American Indian/Native American	16	2.7
Asian/Pacific Islander	48	8.1
Other	9	1.5
Education		
Less than high school	6	1.0
High school diploma	46	7.8
Some college	125	21.1
2-year degree	53	8.9
4-year degree	258	43.5
Professional degree	12	2.0
Master	83	14.0
Doctorate	10	1.7
Household Income		
Less than $20,000	61	10.3
$20,000-$39,999	142	23.9
$40,000-$59,999	127	21.4
$60,000-$79,999	88	14.8
$80,000-$99,999	74	12.5
$100,000-$149,999	70	11.8
$150,000-$199,999	17	2.9
$200,000 and over	6	1.0
Prefer not to answer	8	1.3
Marital Status		
Single	219	36.9
Married without children	73	12.3
Married with children	202	34.1
Divorced	29	4.9
Separated	7	1.2
Widowed	2	0.3
Living w/partner	56	9.4
Prefer not to answer	5	0.8

Conclusion

Customers' demographic profiles do not appear to have some influence on the challenges of using technology. All the relationships between customers' demographic variables and their biggest challenge of using technology were not significant. For this reason, the researcher did not include such relationships in the analysis. However, Eastlick (1996) indicated that technology adopters were younger, highly educated, in higher income brackets, and were more likely to work in white-collar occupation sectors than nonadopters. The current research data suggest that customers' lack of technology may counteract the deployment of using iPads, tablets, and computer-based kiosks in either a quick-service or casual-dining restaurant. The findings also indicated that as customers visit a restaurant more frequently, customers become more familiar with the restaurant menu and payment options.

Restaurant technology designers need to make conscious efforts to address customers' concerns in their system design. Restaurants' employees must provide potential customers with an accurate explanation of how the system may help them perform their purchase decision-making process. The findings indicated that the customers' lack of knowledge was the dominant biggest challenge for using technology across the three meals and drinks in a restaurant. The key ingredient in the success rate of using iPads, tablets, or computer-based kiosks is the balance between automation and personalized service. Restaurant management should be capable and willing to support customers when they need it. The findings also indicated that customers' other biggest challenges for using iPads, tablets, or computer-based kiosks into eight categories: consistency and data security, the system of ipads, tablets, or computer-based kiosks, human interaction, relaxation, customization, unemployment rate, cleanliness, menu design, and layout.

References

Ahn, J., and Seo, S. (2018). Consumer responses to interactive restaurant self-service technology (iPads): The role of gadget-loving propensity. *International Journal of Hospitality Management*, *74*, pp. 109-121.

Ariffin, H., Bibon, M., & Abdullah, R. (2012). Restaurant's Atmospheric Elements: What the Customer Wants. *Social and Behavioral Sciences*, (38), pp. 380-387.

Buhalis, D. (1998). *Information technologies in tourism: Implications for the tourism Curriculum*. Springer Vienna.

Chen, A. and Peng, N. (2018). Examining consumers' intentions to dine at luxury restaurants while traveling. *International Journal of Hospitality Management*, *71*, pp.59-67.

Cobos, L., Mejia, C., Ozturk, A. and Wang, Y. (2016). A technology adoption and implementation process in an independent hotel chain. *International Journal of Hospitality Management, 57*, pp. 93-105.

Collins, G., Cobanoglu, C., & Malik, T (2003). *Hospitality Information Technology: Learning*

Curran, J. and Meuter, M. (2005). Self-service technology adoption: comparing three technologies. *Journal of Services Marketing, 19*(2), pp.103-113.

Deliza, R., MacFie, H., & Hedderley, D. (1999). An investigation on the package features affecting consumer perception of fruit juice using repertory grid and focus group methods. *Brazilian Journal of Food Technology*, *2*, pp. 63–71.

DeMicco, F., Cobanoglu, C., Dunbar, J., Grimes, R., Chen, C., & Keiser, J. (2015). *Restaurant Management: A Best Practices Approach.* Dubuque, IA: Kendall/Hunt.

Eastlick, M. (1996) Consumer intention to adopt interactive teleshopping. Marketing Science Institute, Report No. 96-113, Cambridge, MA.

FSR Magazine, (2015). Ziosk and Uber Bring On-Demand Rides to Chili's Guests. (Online). Available from: https://www.fsrmagazine.com/technology/ziosk-and-uber-bringdemand- rides-chilis-guests?microsite=15. (Retrieved 6.30.18).

Hoshmand, S. (2018). Here's why customers are Demanding for Self-Service Kiosks. (online). Retrieve from: http://blog.givex.com/blog/heres-why-consumers-are-demanding-for-self-service-kiosks (Accessed on January 10th, 2021). How to Use it (5th Ed). Kendall Hunt.

Kim, J., Mejia, C. and Connolly, D. (2017). Tablets and Tablet Apps: What Do Hotel Customers Want?, *International Journal of Hospitality & Tourism Administration,* 18 (3), pp. 307-333, DOI: 10.1080/15256480.2016.1276004

Magotra, I., Sharma, J. and Sharrma, S. (2018). Investigating linkage between customer value and technology adoption behavior: A study of banking sector in India. *European Research on Management and Business Economics, 24*. pp. 17-26.

Mick, D. G., & Fournier, S. (1998). Paradoxes of technology: Consumer cognizance, emotions, and coping strategies. *Journal of Consumer Research, 25*(2), 123.

National Restaurant Association (2016). Mopping the Restaurant Technology Landscape Report. (Online). Available from: https://www.qsrmagazine.com/content/mapping-restaurant-technology-landscape (Accessed on January 12, 2021).

Olsen, M. D. & Connolly, J. D. (2000). Experienced-based Travel. *Cornell Hotel and Restaurant Administration Quarterly*, *41*, 30.

Ryu, K., & Han, H. (2011). New or repeat customers: How does physical environment influence their restaurant experience? *International Journal of Hospitality Management, 30*(3), 599-611.

Ryu, K., Han, H. and Jang, S. (2010). Relationships among hedonic and utilitarian values, satisfaction, and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management, 22*(3), pp.416-432.

Shell, M. and Buell, R. (2019). Why Anxious customers prefer Human Customer Service. (online). Retrieve from: https://hbr.org/2019/04/why-anxious-customers-prefer-human-customer-service (Accessed on January 10th, 2021)

Teng, Y., Wu, K., & Liu, H. (2015). Integrating altruism and the theory of planned behavior to predict patronage intention of a green hotel. *Journal of Hospitality & Tourism Research, 39*(3), 299-315.

Tudoran, A., Olsen, S., and Dopico, D. (2009). The effect of health benefit information on consumers health value, attitudes and intentions. *Appetite*, 52, pp. 568-579.

Wang, H. and WU, S. (2013). Factors influencing behavioural intention to patronise restaurants using iPad as a menu card**.** *Behaviour & Information Technology*, *33*(4). pp. 395-409