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Cornell Hospitality Report

Ready and Willing:

Restaurant Customers' View of Payment Technology

by Sheryl E. Kimes, Ph.D., and Joel E. Collier, Ph.D.

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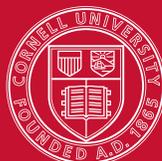
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EXECUTIVE SUMMARY

Restaurant guests seem enthusiastically ready to adopt customer facing payment technologies, at least in casual restaurants, according to this study of the views of 1,297 U.S. consumers. Three sub-samples of consumers rated table-top tablets, smartphones, and traditional check settlement against eight measurement constructs. The constructs were accuracy, control of pacing, convenience, efficiency, experience quality, future spending intentions, privacy, and satisfaction with the payment method. In all eight constructs, paying with technology was rated significantly higher than the traditional settlement approach. For all but efficiency, the respondents' ratings were no different for smartphones and table-top tablets, but the tablets were rated as significantly more efficient than smartphones. While these ratings may be different for other restaurant segments (or other countries' consumers), it appears that restaurant operators do not have to be concerned about guests' acceptance of customer payment technologies. In fact, given increasing privacy concerns, some guests may greatly appreciate the control and privacy that they gain by being able to use payment technologies.

ABOUT THE AUTHORS

Sheryl E. Kimes, Ph.D., is a professor of operations management and a Menschel Distinguished Teaching Fellow in the School of Hotel Administration at Cornell University, where she has served both as interim dean and as the school's director of graduate studies. Her research interests include revenue management and forecasting in the restaurant, hotel, and golf industries. She was given the Lifetime Achievement Award by the College of Service Operations of the Production and Operations Management Society and was honored with the Industry Relevance Award by the Cornell University Center for Hospitality Research in 2010, 2012, and 2014. She has published more than 50 articles in leading journals such as *Interfaces*, *Journal of Operations Management*, *Journal of Service Research*, *Decision Science*, and the *Cornell Hospitality Quarterly*. In addition, she has published over 25 Cornell Center for Hospitality Research Reports and has been an invited speaker at numerous international



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The restaurant industry is aware of the potential advantages of customer-facing payment technologies (CFPT), among them increased convenience, improved security of payment information, and increased speed. These technologies include smartphone payment apps, table-top tablet payment technologies, and RFID payment approaches.¹ The key questions in the implementation of these technologies are how they affect customers' satisfaction, experience quality, and future spending. These questions are important because we anticipate rapid growth in the use of this technology. As of this year, only about one-eighth of the respondents in our earlier survey of U.S. restaurant operators were using some sort of CFPT, but 47.3 percent were thinking of adopting the technology in the near future.² A study by the National Restaurant Association had a similar outcome: over half of full-service restaurant customers said they would use CFPT if it were available, but at the time of that study, fewer than 5 percent of restaurants offered these sorts of technologies.³

¹ Vanessa Wong, "Chipotle Wants to Speed up Mobile Payments," *Bloomberg BusinessWeek* (2014). <http://www.businessweek.com/articles/2014-02-03/chipotle-wants-to-speed-up-with-mobile-payments>. Last viewed 4/18/14; and Technomic (2014), "Technology Transforming the Restaurant Experience: Mobile Payment," *American Express Marketing Briefing*. https://www.technomic.com/files/Newsletters/Marketbrief/Marketbrief_2-14.pdf. Last viewed 4/18/14.

² Sheryl E. Kimes and Joel E. Collier, "Customer Facing Payment Technology in the U.S. Restaurant Industry," *Cornell Hospitality Report*, Vol. 14, No. 12 (2014), Cornell Center for Hospitality Research.

³ National Restaurant Association, "2013 Restaurant Industry Forecast" (Chicago: National Restaurant Association, 2012).

Juniper Research estimates that the global mobile payment market grew at an annual pace of 40 percent in the past four years, from US\$170 billion in 2010 to US\$507 billion at this writing.⁴ Likewise, Gartner Research estimates that the global mobile payment market will encompass 448 million users with a transaction value of US\$617 billion in 2016.⁵

Consumers have said they like CFPT because of the technology's ease, speed, security, and control, while restaurants see the potential for reduced labor costs, increased revenue, and improved customer satisfaction.⁶ CFPT has been particularly successful for quick-service and fast-casual restaurants. Three years after Starbucks launched its mobile payment service in 2011 the firm estimated that 15 percent of its U.S. transactions were made using their mobile payment app.⁷ Chipotle recently spent \$10 million to add mobile payment to its ordering app. As a result, Chipotle's restaurants have been able to process six more transactions per hour during the lunch peak and five more during the dinner peak.⁸

One of the biggest moves into CFPT has been at Chili's, which installed Ziosk, a tableside tablet-based system, in all of their Brinker-operated restaurants. During their six-month test, restaurants with the tablets had an increase in average check per person (meaning additional revenue for both the restaurant and the waitstaff). In addition, a much higher proportion of guests filled out customer satisfaction surveys and signed up for future email marketing.⁹

As this report was being prepared, Apple Computer released its payment app, Apple Pay, with plans to launch in Panera restaurants in mid-October 2014.¹⁰

⁴ Suzanne Cluckey, "Mobile Payments 101: Restaurant", mobilepaymentstoday.com. (2011), Last viewed 11/31/2013. <http://www.mobilepaymentstoday.com/whitepapers/4216/Mobile-Payments-101-Restaurant>.

⁵ "Restaurant Technology Goes Full Spectrum," *Hospitality Technology* (2013). Last viewed 4/19/2013. <http://hospitalitytechnology.edgl.com/reports/2013-Restaurant-Technology-Study85036>.

⁶ Michael J. Dixon, Sheryl E. Kimes, and Rohit Verma, "Customer Preferences and Use of Technology-Based Service Innovations in Restaurants," *Cornell Hospitality Report*, Vol. 9, No. 7 (2009), Cornell University Center for Hospitality Research.

⁷ Laurie Kulkowski, "Is the Starbucks App the Final Push for Restaurant Mobile Payments?" *The Street* (2014). <http://www.thestreet.com/story/12553533/1/is-the-starbucks-app-the-final-push-for-restaurant-mobile-payments.html>. Last viewed 4/19/2013.

⁸ Wong, *op.cit.*

⁹ Jeff Omohundro, "Brinker International: Raising Outlook—Chili's Exploring New Technology," Davenport and Company Equity Research (2013); and Alex Konrad, "Chili's to Install Tablets for Every Table: More Tips But a Cloudier Future for Servers," *Forbes* (2013) <http://www.forbes.com/sites/alexkonrad/2013/09/17/chilis-to-install-tablets-at-every-table/>. Last viewed 4/18/14.

¹⁰ See: Stan Schroeder, "Internal Panera Bread Memo Says Apple Pay Will Launch on October 20," Mashable.com, viewed 9/16/14. <http://mashable.com/2014/10/16/panera-bread-apple-pay/>.

Not to be left behind by brick and mortar restaurants, OpenTable has been piloting Chalo, a mobile payment system purchased in June 2013, in restaurants in major U.S. cities. Chalo is integrated with a number of different point of sale systems.¹¹

Potential Benefits for Customers and Operators

By allowing operators to reduce the number of steps in the payment process, CFPT theoretically offers restaurateurs the opportunity not only to speed up payment, but also to improve customer satisfaction, reduce labor costs, increase revenue, and provide better customer data—as well as offer tablet-based entertainment in some cases. Potential barriers to CFPT adoption include infrastructure issues, the cost of CFPT devices, the cost of integrating CFPT with existing POS and payment systems, security concerns, and the impact of reduced customer contact. In addition, the CFPT industry is still quite fragmented, and many restaurateurs are unsure of which vendors or technology to select.¹² Moreover, there is a continuing concern about the potential barrier that technology might create between servers and guests.¹³

Background

While our earlier study focused on what operators think about CFPT, we wanted to get additional insight into how customers view and react to this technology. We can see reasons that customers should like CFPT, since it should give them more control over portions of their dining experience (notably, settlement) and enhance perceived convenience, payment accuracy, and privacy. If guests do like this technology, it may increase their satisfaction, boost future spending intentions, and improve the quality of their experience.

Before we explain our study, let's look at the issues surrounding accuracy, control of service pace, convenience, efficiency, the experience itself, privacy, and customers' overall satisfaction.

Accuracy. One strong argument for payment technology is that the final bill should be correct and the payment likewise should be specified correctly. With CFPT, customers can verify their order information and payment confirmation at their discretion, rather than when the server drops the check.¹⁴

¹¹ Alice Truong, "OpenTable to Introduce Mobile Payment," *Fast Company* (2014). www.fastcompany.com/3027111/opentable-introduces-mobile-payments. Last viewed 4/18/14.

¹² For a more complete discussion of the potential benefits and barriers, please see: Kimes and Collier, *op.cit.*

¹³ See: Michael Giebelhausen, "Cyborg Service: The Unexpected Interaction of Technology in the Employee–Guest Exchange," *Cornell Hospitality Report*, Vol. 14, No. 19 (October 2014); Cornell Center for Hospitality Research.

¹⁴ Collier and Kimes (2013), *op. cit.*; Pratibha A. Dabholkar, "Consumer Evaluations of New Technology-based Self-service Options: An Investiga-

Control of service pace. The concepts of service pace and duration are often used interchangeably, but they are distinctly different concepts. Duration is how long an event lasts or the amount of time required to complete a task.¹⁵ Pace focuses on the speed of an activity or the rate in which it takes place.

Servers are generally aware that pace varies during different meal stages. Customers generally don't want to rush at the beginning, when they are seated through the point when their first menu item is served, and they especially want to take their time in actually consuming the meal. However, once they ask for their check, customers prefer a faster pace for settlement and departure.¹⁶

Payment technology addresses this issue by giving the customer the ability to control both the pace and duration of the post-meal process. The ability of customers to control service pacing is a prominent theme of studies on self-service technologies.¹⁷ We should note that the Chili's technology addresses pacing for both the beginning and ending meal phases, since it allows guests to order their meal as well as settle the check.

Convenience. In discussing convenience, we are usually considering transactional convenience, which involves the amount of time and trouble involved for the customer to pay for the service rendered. When customers are allowed to change the pace of a service with payment technology, the perceived time and effort to complete the transaction should be minimized, and the actual time and effort should be reduced.

Efficiency. What customers seek in terms of efficiency is a process that is structured to function effectively with a minimum amount of customer effort. Efficiency in a service context is often associated with the speed at which the payment takes place.¹⁸ Customers' desire for speed and efficiency

is one of the biggest reason customers may decide to forgo the offer of full service and perform a service themselves.¹⁹

Experience quality. Experience quality is defined as a customer's evaluation of an experience or interaction during an activity.²⁰ For this study, we focus on experience quality as it specifically relates to technology used in the payment process.

Privacy. The privacy boost of payment technology occurs because customers' payment information is protected, since that they never hand over their credit card.²¹ Privacy of payment information has been a growing concern, given the estimate that 70 percent of all credit card skimming and fraud takes place in the restaurant industry.²² This is not an idle concern. As this report was being finalized, the Manhattan District Attorney reported the arrest of five employees at Saks Fifth Avenue for customer identity theft. In this scheme, the employees are charged with using some 50 customers' information to purchase bags and shoes worth \$400,000, which were then sold on the black market.²³ When customers can direct the payment process, they no longer need to share payment information with employees, thus alleviating potential privacy concerns.²⁴

Customer satisfaction. Perhaps the most critical issue is whether the payment method affects customer satisfaction and future spending intentions. In this regard, we note that customers' quality assessments have been shown to influence their satisfaction evaluations and future behavioral intentions.²⁵

tion of Alternative Models of Service Quality," *International Journal of Research in Marketing*, Vol. 13, No. 1 (1996), pp. 29-51.

¹⁵ Heejin Lee, "Time and Information Technology: Monochronicity, polychronicity and temporal symmetry," *European Journal of Information Systems*, Vol. 8, No. 1 (1999), pp. 16-26.

¹⁶ Breffini M. Noone, Sheryl E. Kimes, Anna S. Mattila, and Jochen Wirtz, "Perceived Service Encounter Pace and Customer Satisfaction," *Journal of Service Management*, Vol. 20, No. 4 (2009), pp. 380-403.

¹⁷ A. Dabholkar, L. Michelle Bobbitt, and Eun-Ju Lee, "Understanding Consumer Motivation and Behavior Related to Self-Scanning in Retailing," *International Journal of Service Industry Management*, Vol. 14, No. 1 (2003), pp. 59-95; and Devashish Pujari, "Self-Service with a Smile? Self-service technology (SST) Encounters Among Canadian Business to Business," *International Journal in Service Industry Management*, Vol. 15 No. 2 (2004), pp. 200-219.

¹⁸ A. Parasuraman, Valarie A. Zeithaml, and Arvind Malhotra (2005), "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," *Journal of Service Research*, Vol. 7, No. 3 (2005), pp. 213-233.

¹⁹ Dabholkar *et al.*, *op. cit.*; and Melanie Howard and Caroline Worboys, "Self-Service: A Contradiction in Terms or Customer-led Choice?," *Journal of Consumer Behavior*, Vol. 2, No. 4 (2003), pp. 382-392.

²⁰ Ting-Yueh Chang, and Shun-Ching Horng, "Conceptualizing and Measuring Experience Quality: The Customer's Perspective," *Service Industries Journal*, Vol. 30, No. 14 (2010), pp. 2401-2419; and Fred Lemke, Moira Clark, and Hugh Wilson, "Customer Experience Quality: An Exploration in Business and Consumer Contexts Using Repertory Grid Technique," *Journal of the Academy of Marketing Science*, Vol. 39, No. 6 (2011), pp. 846-869.

²¹ Parasuraman *et al.*, *op. cit.*

²² Grant Drummond, "New Technology Helps Hospitality Industry Battle the Growing Fraud Problem," *Nation's Restaurant News*, Vol. 41, No. 36 (2007), p. 28.

²³ Edgar Sandoval and Corky Siemaszko, "Saks Fifth Avenue Employees Busted in Identity Theft Ring," *New York Daily News*, October 6, 2014.

²⁴ Norman E. Bowie and Karim Jamal, "Privacy Rights on the Internet: Self-Regulation or Government Regulation," *Business Ethics Quarterly*, Vol. 16, No. 3 (2006), pp. 323-342.

²⁵ Hans H. Bauer and Tomas Falk, "eTransQual: A Transaction Process-based Approach for Capturing Service Quality in Online Shopping," *Journal of Business Research*, Vol. 59, No. 7 (2006), pp. 866-875; Joel E. Collier and Carol C. Bienstock, "Measuring Service Quality in E-Retailing," *Journal of Service Research*, Vol. 8, No. 3 (2006), pp. 260-275; Beth, Davis-Sramek, Cronelia Droge, John T. Mentzer, and Matthew B.

Experimental payment scenarios

Traditional

You have decided to go to your favorite casual dining restaurant to eat. After finishing your meal, you are ready to pay the check and leave to continue your night out. You notice that the restaurant is not very busy and there are no customers waiting to be seated. The next time the server comes to the table, you state that you are ready to pay your bill. The server comes back and drops off the check and notes he will be right back. You verify the order details and then proceed to pay with a credit card. After a few minutes, the server comes back and takes the check and your credit card to the back to process the payment. The server returns shortly with your card and a receipt for you to sign. You include a tip, sign the receipt, and then leave the table to continue on with the rest of your night.

Smartphone

Your favorite casual dining restaurant now gives customers the option to use their smartphones to pay for their meals. On your next visit to the restaurant, you finish your meal and are ready to pay the check and leave so you can continue your night out. You notice the restaurant is not very busy and there are no customers waiting to be seated. You pull out your smartphone and log onto the restaurant's payment app. The restaurant's app allows you to verify the details of your order and then proceed to a payment option. You pay for your meal and include a tip for the server using a credit card. Once the payment is processed, you leave the table and proceed with the rest of your night.

Tablet

Your favorite casual dining restaurant now lets customers use a self-service application to pay for their meal. On your next visit to this restaurant, you finish your meal and are ready to pay the check so you can continue your night out. You notice that the restaurant is not very busy and there are no customers waiting to be seated. At the table, a tablet is attached to the wall where you are seated. From the main menu is an option that says "pay my bill." You select this option, verify your order, add a tip for the server, and then scan your credit card with a card reader that is attached to the tablet. After the payment is processed, the tablet gives you the option to have a receipt emailed to you. Seeing the completed payment screen, you then leave the table and proceed with the rest of your night.

Our Study

We wanted to see whether the type of payment (that is, traditional, smartphone, or table-top tablet) had an impact on customers' perceptions of the seven payment issues that we just outlined, as well as their future patronage and spending intentions. To do this, we conducted three different scenario-based studies where guests paid their bill using the traditional payment method, a smartphone, or a table-top tablet. After they read one of the scenarios (presented in Exhibit 1), respondents were presented with a series of statements relating to the issues that we were testing: accuracy, control of pace, convenience, efficiency, experience quality, future spending intentions, and satisfaction with the payment method. In addition, they were presented with several statements on payment privacy. We also assessed the extent

to which respondents had already used CFPT and their intention to do so.

To measure the study constructs, we compiled a survey consisting of 30 items answered using 7-point Likert-type scales anchored by strongly disagree to strongly agree (except for experience quality and future spending). We adapted questions to test control of pace, efficiency, and privacy from the research of Noone *et al.* and Parasuraman *et al.*²⁶ The items for convenience, accuracy, and satisfaction were adapted from Bienstock *et al.*, Collier and Sherrell, and Oliver and Swan.²⁷ We measured experience quality with a four-item semantic differential scale with anchors of excellent to poor, high quality to low quality, superior to terrible, and outstanding to horrible. Similarly, we measured future spending with a three-item semantic differential scale with anchors of decrease to increase, much less to much more, and lower to higher.

Myers, "Creating Commitment and Loyalty Behavior Among Retailers: What Are the Roles of Service Quality and Satisfaction," *Journal of the Academy of Marketing Science*, Vol. 37, No. 4 (2009), pp. 440-454; Jiun-Shen C. Lin and Pie-Ling Hsieh, "Assessing the Self-Service Technology Encounters: Development and Validation of SSTQUAL Scale," *Journal of Retailing*, Vol. 87, No. 2 (2011), pp. 194-206; Richard A. Spreng and Robert Mackoy, "An Empirical Examination of a Model of Perceived Service Quality and Satisfaction," *Journal of Retailing*, Vol. 72, No. 2 (1996), pp. 201-214; and Valarie A. Zeithaml, Leonard L. Berry, and A. Parasuraman, "The Behavioral Consequences of Service Quality," *Journal of Marketing*, Vol. 60, No. 2 (1996), p. 31.

²⁶ Noone *et al.*, *op.cit.*; and Parasuraman *et al.* *op.cit.*;

²⁷ Bienstock *et al.*, *op. cit.*; Joel Collier and D.L. Sherrell, "Examining the Influence of Control and Convenience in a Self-service Setting," *Journal of the Academy of Marketing Science*, Vol. 38, No. 4 (2010), pp. 490-509; and Richard L. Oliver and John E. Swan, "Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach," *Journal of Marketing*, Vol. 53 (April 1989), pp. 21-35.

Constructs and survey items**Service Pace**

- Using the tablet to pay would give me the power to control the speed of the payment process
- Using the tablet to pay would give me control over the pace of the payment process
- Using the tablet to pay would give me the ability to control the time it takes to complete the payment process
- Using the tablet to pay would allow me to control the duration of the payment process

Convenience

- Using the tablet would allow me to start the payment process whenever I choose
- Using the tablet would allow me to start the payment process when it is convenient for me
- I like the ability to initiate the payment process when I want

Privacy

- I prefer to keep my payment information private from frontline employees
- I do not like to share my payment information with others
- I prefer to keep my credit card in sight at all times
- I am concerned about sharing my payment information with frontline employees

Efficiency

- Using the tablet to pay would allow me to complete the transaction quickly
- Using the tablet to pay would be simple
- Using the table to pay would enable me to quickly view my payment information
- Paying by tablet would make it easy to pay for my meal
- Paying by tablet would require little effort to complete a transaction

Payment Accuracy

- Using the tablet to pay allows me to be confident about the accuracy of my bill
- Using the tablet to pay would help ensure that my bill was correct
- I believe that using the tablet to pay would promote an accurate bill
- Using the table to pay would allow me to be certain about the details of my bill

Experience Quality of the Payment Process

- How would you rate the quality of your experience in regards to the payment process at this restaurant?
 - o Poor/ Excellent
 - o Low Quality/ High Quality
 - o Terrible/ Superior
 - o Horrible/ Outstanding

Satisfaction with the Payment Experience

- In general, I would be happy with the payment process of this service experience
- I would be pleased with the quality of this payment experience
- I would be satisfied with the payment process from this restaurant

Future Spending

- Based on this payment method, I believe that my future spending with this restaurant would be:
 - o Decreased/Increased
 - o Much Less/Much More
 - o Lower/Higher

Note: Except for future spending, items were scored on a 7-point Likert-type scale anchored at 1 = strongly disagree and 7 = strongly agree.

EXHIBIT 3
Mean values by payment method

	Traditional	Smartphone	Tablet
Accuracy	5.163	5.822	5.881
Control	4.884	5.822	5.910
Convenience	5.404	6.120	6.249
Efficiency	5.305	5.864	6.054
Experience Quality	5.144	5.851	5.936
Privacy	4.485	4.801	4.960
Satisfaction	5.424	5.896	6.006
Future Spending	4.392	4.928	5.000

Before undertaking the final surveys, we conducted a pretest of 209 consumers from a national panel database. To assess the validity and reliability of the scale items, we conducted an exploratory factor analysis, which demonstrated that all scale items loaded on their appropriate construct. An assessment of the reliability of the scale items revealed that all constructs were well above recommended standards ($\alpha > .70$).

We then returned to the national panel database for the full survey. For the traditional dining experience scenario, we drew a final sample of 395 (after dropping 33 respondents). For the tablet settlement survey, our sample ended up at 509 respondents, as 149 respondents had to be dropped for incomplete surveys or similar issues. In the same way, our n for the smartphone survey was 373, as 53 were dropped.

EXHIBIT 4
Post hoc tests by payment method (with significance levels)

Construct	Payment Method	Mean	Significance Levels		
			Traditional	Smartphone	Tablet
Accuracy	Traditional	5.163		0.000	0.000
	Smartphone	5.822	0.000		X
	Tablet	5.881	0.000	X	
Control of Pace	Traditional	4.884		0.000	0.000
	Smartphone	5.882	0.000		X
	Tablet	5.910	0.000	X	
Convenience	Traditional	5.405		0.000	0.000
	Smartphone	6.120	0.000		X
	Tablet	6.249	0.000	X	
Efficiency	Traditional	5.305		0.000	0.000
	Smartphone	5.864	0.000		0.012
	Tablet	6.054	0.000	0.012	
Privacy	Traditional	4.485		0.003	0.000
	Smartphone	4.801	0.003		X
	Tablet	4.960	0.003	X	
Experience Quality	Traditional	5.144		0.000	0.000
	Smartphone	5.851	0.000		X
	Tablet	5.936		X	
Satisfaction	Traditional	5.423		0.000	0.000
	Smartphone	5.896			X
	Tablet	6.006		X	
Future Spending	Traditional	4.392		0.000	0.000
	Smartphone	4.928			X
	Tablet	5.000		X	

EXHIBIT 5

Mean ratings of CFPT users and non-users

Construct	Users	Non-Users	Significance Level
Accuracy	5.76	5.49	<.001
Control	5.66	5.45	.002
Convenience	6.04	5.83	<.001
Efficiency	5.85	5.66	.001
Experience Quality	5.73	5.57	.003
Privacy	4.77	4.76	0.82
Satisfaction	5.91	5.64	<.001
Future Spending	5.48	5.20	<.001

EXHIBIT 6

Perceptions of accuracy for three payment methods

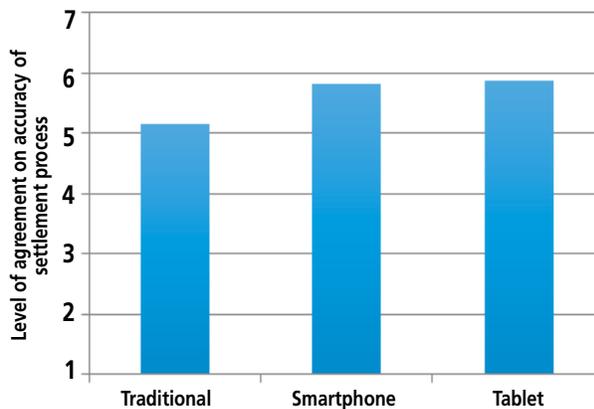
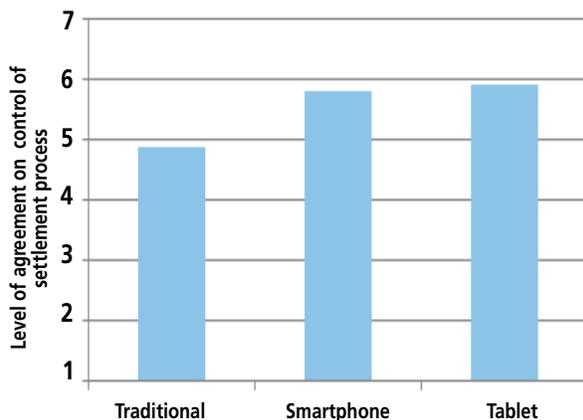


EXHIBIT 7

Perceptions of pacing control for three payment methods



Confirmatory factor analyses for all surveys determined that all items loaded on the appropriate underlying concept and all loadings were significant. A reliability calculation for each construct indicated that all constructs had an acceptable level of reliability.²⁸

Since the survey items varied slightly among the three payment methods, we assessed measurement invariance to verify the consistency of the constructs' meaning. We found no significant differences in how the constructs were interpreted in the three different surveys.²⁹ Exhibit 2 shows the questions asked regarding the eight constructs that we tested.

Results

Demographic profile. The respondents were predominantly under the age of 45 (<25, 56.8%; 26–45, 31.1%) and male (62.7%). About one-half (52.5%) had paid for something (not necessarily a restaurant meal) with CFPT, and another 25.9 percent indicated that they were likely to use CFPT in the near future. Younger respondents were more likely to have used CFPT than older respondents (<25, 56.9%; 26–45, 52.4%; >40, 32.0%), but CFPT usage did not vary by gender. Interestingly, the likelihood of using CFPT in the future did not vary significantly by age (<25, 53.9% of non-users; 26–45, 62.8% of non-users; >45, 46.2%), but did vary by gender, as men said they were more likely to use it (male, 54.7%; female, 47.0%). We used ANOVA to test for the impact of payment method for each of the eight constructs. We conducted a separate ANCOVA in which we controlled for previous CFPT use.³⁰

Results

For seven of the eight constructs, there was no significant difference in the ratings of respondents who viewed the smartphone and tablet scenarios. Ratings for smartphones and tablets diverged only for efficiency, where the table-top tablets emerged as more efficient. In all cases, the traditional settlement method was rated significantly lower

²⁸ Jum C. Nunnally and Ira H. Bernstein, *Psychometric Theory*, 3rd edition (New York: McGraw-Hill, 1994). To further assess the convergent and discriminant validity of the scales, the average variance extracted per construct was calculated and compared to the shared variance between constructs. Across all three surveys, the average variance extract for each construct exceeded .50, and no shared variance between constructs exceeded the average variance extracted per construct reaffirming the validity of the scales.

²⁹ We used the procedure suggested by Hair *et al.* in which a partial metric invariance test where items were constrained across groups to determine if invariance was present. The results of a chi-square difference test across all the groups were non-significant providing support that the meaning of our constructs was similar across groups. See: J. Hair, W. Black, B. Babin, R. Anderson, and R. Taham, *Multivariate Data Analysis*, Sixth Edition (Upper Saddle River, NJ: Pearson Prentice-Hall, 2006).

³⁰ Respondents were asked if they had ever made a mobile device to make payment. This question was not specific to restaurants and included any mobile payment.

than the technology. Exhibit 3 shows the means for all eight factors, and Exhibit 4 shows the results of *post hoc* tests of significance.

With the exception of privacy, respondents with previous experience in using CFPT rated all constructs significantly higher than respondents who had not used CFPT to purchase something. Interestingly, even though the non-user means were lower than the user means, means for both groups were still quite high (between 5.2 and 5.8, see Exhibit 5). We controlled for age and gender in a separate ANCOVA and found no significant effect. All differences presented are significant at the $p < .05$ level. Next, we discuss the results for each of the eight constructs.

Perceived accuracy. Technology-based payments were viewed as significantly more accurate, as compared to the traditional payment scenario (traditional, 5.163; smartphone, 5.822; tablet, 5.881; Exhibit 6).

Perceived control of pace. As expected, respondents in the smartphone and tablet scenarios considered their perceived control associated with payment to be significantly higher than those in the traditional payment scenario (traditional, 4.855; smartphone, 5.822; tablet, 5.910; Exhibit 7).

Perceived convenience. Once again, respondents in the smartphone and tablet scenarios considered perceived convenience to be significantly higher than those in the traditional payment scenario (traditional, 5.404; smartphone, 6.120; tablet, 6.249; Exhibit 8).

Efficiency. On this construct only, tablets emerged as more efficient than smartphones. Respondents in the tablet scenario evaluated perceived efficiency to be significantly higher than those in the smartphone and traditional scenarios (traditional, 5.305; smartphone, 5.864; tablet, 6.054; Exhibit 9). However, smartphones were still seen as significantly more efficient than the traditional approach. We'll discuss this finding in more detail below.

Quality of payment experience. Respondents saw no difference in tablets or smartphones with regard to the payment experience, but the two technologies' payment quality was rated as significantly higher than the traditional payment scenario (traditional, 5.144; smartphone, 5.851; tablet, 5.936; Exhibit 10).

Privacy. For privacy, smartphones and tablets were again equally viewed as significantly more comfortable than was the traditional payment scenario (traditional, 4.485; smartphone, 4.801; tablet, 4.960; Exhibit 11).

Overall satisfaction. Respondents who viewed the smartphone and tablet scenarios rated their satisfaction to be significantly higher than those in the traditional payment scenario (traditional, 5.423; smartphone, 5.896; tablet, 5.424; Exhibit 12).

Future spending. Finally, respondents in the smartphone and tablet scenarios were significantly more likely to

EXHIBIT 8

Perceptions of convenience for three payment methods

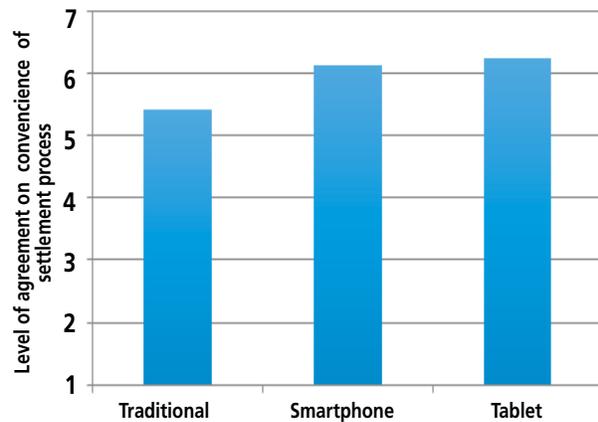


EXHIBIT 9

Perceptions of efficiency for three payment methods

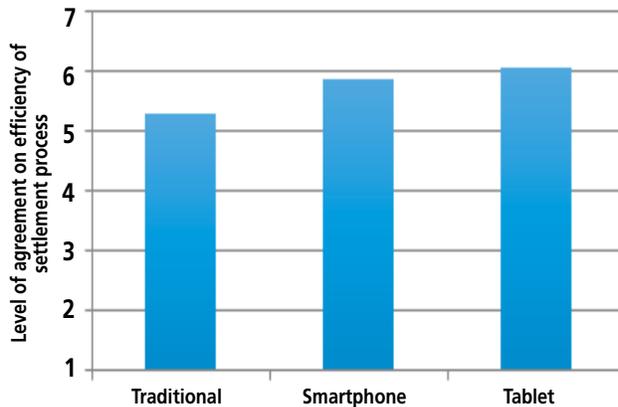


EXHIBIT 10

Perceptions of payment experience quality for three payment methods

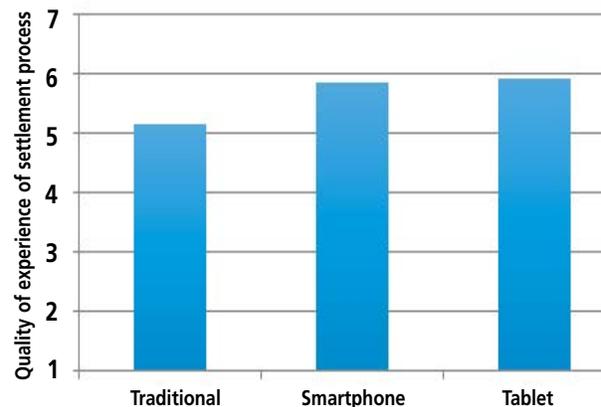


EXHIBIT 11

Perceptions of privacy for three payment methods

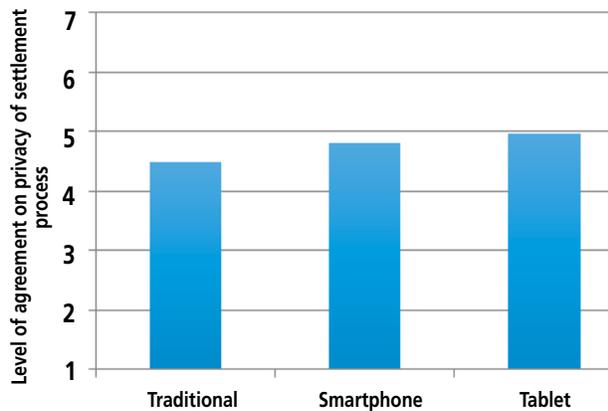


EXHIBIT 12

Overall satisfaction with each of three payment methods

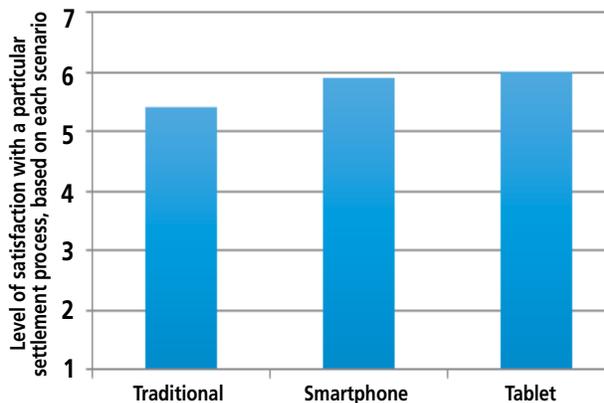
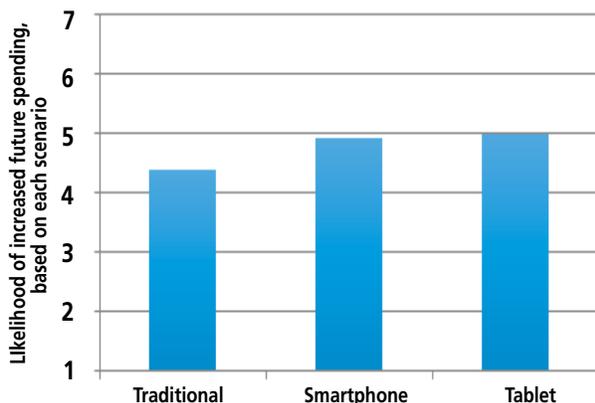


EXHIBIT 13

Future spending projections for each of three payment methods



indicate that they would spend more at the restaurant in the future than those who read the traditional payment scenario (agreement levels: traditional, 4.392; smartphone, 4.928; tablet, 5.000; Exhibit 13).

Implications

Although this study involves scenarios and not actual restaurant check settlement, we conclude that customers are excited about the possibilities of using tablets or smartphones to pay for their transactions. Younger respondents were more likely to have used payment technology at the time of our survey, but about half of our respondents who had not yet used CFPT said they were likely to do so in the future, regardless of age.

Compared to traditional settlement processes, our respondents rated CFPT as giving them more control of the pace of the payment process, greater convenience, and more privacy. With regard to privacy, we again want to note the increasing concern held by guests regarding the security of their payment information. Consequently, we see this finding as particularly compelling. It may be that customers actually feel more comfortable using technology, which represents something of a turnabout from times past.

While traditional settlement was viewed as less efficient than either type of technology, we also noted a divergence in our respondents' efficiency ratings for table-top tablets and smartphones. The most likely explanation for why the tablets might be viewed as more efficient is that paying with the smartphone requires more effort on the part of the customer, including downloading and figuring out how to use the smartphone app. If something went wrong, the customer might feel uncomfortable with asking for help, and the server might not know how that particular app operates. Contrast that with the tablet-based payment system, which is already sitting on the table and runs dedicated software. The guest may already have used the tablet to order her meal. In addition, the server is available to help if necessary, since the technology belongs to the restaurant.

Perhaps the most telling findings are the high ratings customers in the CFPT scenarios gave to satisfaction, quality of the payment experience, and the likelihood that they would spend more at the restaurant in the future.

Limitations of this Research and Future Research

One major limitation of this study is that we used a convenience sample from a national panel database. While the panel is meant to comprise a cross section of consumers, it is possible that our results may not be representative of the U.S. restaurant-going adult population. Another limitation is that the survey was online, which automatically leaves out potential respondents without technology access. In addition, our study was only conducted in the U.S., and our

results may not be generalizable to other parts of the world. We also limited our study to the casual and upscale restaurant segment. Results might vary if we conducted this in the QSR, fast-casual, or fine-dining segments. Finally, our study was survey based. As with all surveys, it is possible that respondents might have misinterpreted the questions or answered them incorrectly.

An interesting extension of this study would be to analyze the impact of the length of wait that occurs during the traditional payment method, as compared with the time involved in using payment technology. Our current version of the traditional scenario assumes that everything went fairly quickly and the server returned shortly with the credit card and a receipt. The contrast between the traditional payment method and technology-based settlement would probably be more pronounced if we specified a long wait.

It would also be interesting to study the underlying psychological reasons why CFPT leads to an increase in average check per person. This was observed in the six-month test by Chili's that we discussed earlier, and we saw it in our related finding that the respondents in the smartphone and tablet scenarios were more likely to indicate that they would return to spend more at the restaurant in the future. The question is whether the relatively fast payment experience with CFPT increases guests' willingness to spend more money and how that operates. It would also be interesting to see whether consumers' repeat purchase intention would increase due to CFPT.

Our study involved consumers' perceptions of the payment process, but a future study could also test the impact of control over one's dining experience (beyond perceived controllability with respect to the payment process). It would be interesting to see whether consumers perceive greater control over their entire service experience because of the CFPT.

Finally, it would be interesting to conduct an international version of this study and one that covers different restaurant industry segments. It is quite possible that

results may vary by nationality and perhaps by segment. Payment technology seems a natural for casual restaurants and QSRs, but one wonders how well technology-based settlement would work in a fine-dining restaurant.

What Next?

For restaurant operators who have not yet installed payment technology, the implication of this study is that it's time to start seriously thinking about how you might use CFPT. Customers not only like the idea, but also seem to be more satisfied with their overall experience when they use payment technology. On the other side of the coin, the technology also offers a number of operating benefits, including reduced labor costs and potentially higher revenue.

As we mentioned above, CFPT adoption in the U.S. restaurant industry is still in its early stages, but it seems ready to mushroom. Our earlier study found that operators who had adopted CFPT reported that they experienced faster check processing, increased customer satisfaction, and reduced customer swaiting time.

We must caution that customer payment technologies are not without their issues. As occurs with almost any technology, operators who had started using CFPT indicated that the key problem they had faced was with system integration. While we cannot conduct a cost-benefit study for all restaurants, the results of our study indicate that customer acceptance is most likely not going to be an issue—quite the reverse.

In closing, however, despite our respondents' obvious enthusiasm for customer payment technology, we are not arguing that CFPT should replace the traditional payment process. We note studies that have shown that when customers are forced to use a self-service technology (rather than choose to do so), they are likely to experience lower satisfaction. We are instead suggesting that CFPT be offered as an alternative to the traditional payment process and allow customers to choose whether they prefer to use technology to settle their check or to do so in the traditional manner. ■

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