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PYMNTS.com is where the best minds and the best content meet on the web to learn about "What's Next" in payments and commerce. Our interactive platform is reinventing the way in which companies in payments share relevant information about the initiatives that shape the future of this dynamic sector and make news. Our data and analytics team includes economists, data scientists and industry analysts who work with companies to measure and quantify the innovation that is at the cutting edge of this new world.



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ACKNOWLEDGMENT

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PYMNTS.com retains full editorial control over the findings presented, as well as the methodology and data analysis.











02

INTRODUCTION

05

USAGE

07

DEMOGRAPHICS

09

FREQUENCY

11

PAYMENT METHODS

15

RECONNAISSANCE

19

THE BOTTOM LINE

22

CONCLUSION

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DIEBOL

INTRODUCTION

AMERICA, A SELF-SERVICE ECONOMY

Jack Ma, founder of Chinese eCommerce giant Alibaba, coined the phrase "new retail" to describe his vision for the fusion of eCommerce and brick-and-mortar shopping. In retrospect, the world should have anticipated his subsequent venture into traditional retail. It was this "new retail" vision which led Ma to open retail brick-and-mortar shops in 13 Chinese cities — including Shanghai — several of which function without cashiers and allow customers to pay using facial recognition technology.

Not to be outdone, Alibaba's only plausible domestic rival, Tencent, quickly partnered

with French grocery chain Carrefour,
Europe's largest retailer, to open several
of its own shops in China — and allows
customers to pay with facial recognition
or WeChat Pay. Carrefour now operates
brick-and-mortar retail shops In Shenzhen,
Shanghai and elsewhere in the mainland
— and all to test the technology for future
European consumption.

Those living between the Atlantic and Pacific coasts may hear such stories about self-service retail and assume it is somehow foreign to the United States, but they would be mistaken.

¹ Jacobs, Harrison. Alibaba's futuristic supermarket in Chins is lightyears ahead of the U.S. — and shows where Amazon will likely take Whole Foods. Entrepreneur. 2018. https://www.entrepreneur.com/article/313765. Accessed June 2018.

² Vidalon, Dominique. Carrefour sees China as testing ground for new retail methods. Reuters. 2018. https://www.reuters.com/article/us-carrefour-china/carrefour-sees-china-as-testing-ground-for-new-retail-methods-idUSKCN1J01WE. Accessed June 2018.



The U.S. is home to countless homegrown businesses driving the self-service push. In fact, one of the most enthusiastic and ambitious investors in such systems is golden-arched, fast food giant McDonalds. It announced in early June 2018 that it planned to install self-service kiosks and mobile app payment systems at approximately 1,000 U.S. locations each quarter for eight or nine consecutive guarters.³

The U.S.' interest in self-service retail expands far beyond the deep fryer, though. New York's native retail chain Macy's announced its intention to begin testing its app-supported Mobile Checkout in March 2018. Mobile Checkout will be available for both iOS and Android devices, allowing users to scan items for purchase and quickly verify transactions with associates, thereby simplifying the checkout process.⁴

Amazon has gone one step further with its Seattle-based Amazon Go venture. It made waves when reports surfaced it had opened a supermarket without checkout lines or self-service tills. Rather, its customers scan QR codes with their mobile devices before entering, and their account-connected credit cards are billed upon departure. The project appears to have been well-received by consumers, too, as the eCommerce giant recently announced it will open two similar stores in the U.S. — though it has yet to confirm where or when.

So, what, exactly, does "self-service" entail?

Self-service retail is a broad term encompassing any enterprise that allows consumers to serve as their own customer service representatives, usually through technology. Self-service gas stations are included here, but the cutting edge of such retail veers toward technological innovations that provide shoppers with faster, easier ways to pay. From QR codes and self-service kiosks to cashier-less stores and beyond, examples of self-service technology can now be found in almost every retail sector.

Some skeptics warn against overzealous self-service adoption, however. They charge that merchants, driven by a desire to slash costs, are liable to implement the technology even if it may drive customers away or reduce revenue. The *Harvard Business Review* once pointed to the infamous Amazon Go store with trepidation, expressing concern over customers' reception of self-checkout services and cautioning that not every implementation may yield the desired results.⁷

It is, therefore, imperative to answer two questions: How do consumers really feel about self-service retail? Which forms of self-service technology most appeal to them?

PYMNTS, in collaboration with self-service, security and solutions provider Diebold Nixdorf, endeavored to answer these questions. We surveyed 2,170 Americans regarding their

familiarity with self-service technology — including their impressions of it — to gain a finer understanding.

We ensured that our sample was Censusbalanced, with demographics comparable to those of the general U.S. population. Our sample's age range, gender distribution, educational backgrounds, income levels and employment statuses all corresponded with those of the general American populace. In this way, we achieved the most accurate indication of Americans' attitudes toward self-service retail.

Our findings show that self-service technology is largely appealing to merchants and shoppers alike.

Self-service technology is

appealing

to merchants and shoppers alike.

³ Price, Emily. McDonald's is planning to add self-service kiosks across the U.S. Fortune. 2018. http://fortune.com/2018/06/05/mcdonalds-self-service kiosks across the U.S. Fortune. 2018. http://fortune.com/2018/06/05/mcdonalds-self-service kiosks across the U.S. Fortune. 2018. http://fortune.com/2018/06/05/mcdonalds-self-service kiosks across the U.S. Fortune. 2018.

⁴ Unknown Author. Macy's, Inc. launches new app and in-store technology features to enhance the consumer shopping experience. Businesswire. 2018. https://www.businesswire.com/news/home/20180319005605/en/Macy%E2%80%99s-Launches-New-App-In-Store-Technology-Features. Accessed June 2018.

⁵ Johnston, Chris. Amazon opens a supermarket with no checkouts. BBC News. 2018. https://www.bbc.com/news/business-42769096. Accessed June 2018.

⁶ Associated Press. Amazon to open two more cashier-less stores in US. New York Post. 2018. https://nypost.com/2018/05/15/amazon-to-open-two-more-cashier-less-stores-in-us/. Accessed June 2018.

SELF-SERVICE RETAIL

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⁷ Brewer, D.; Faigen, G. and Harrison, N. and Why Amazon's grocery store may not be the future of retail. Harvard Business Review. 2018. https://hbr.org/2018/02/why-amazons-grocery-store-may-not-be-the-future-of-retail. Accessed June 2018.

HOW AMERICANS

USE SELF-SERVICE RETAIL OPTIONS

Self-service checkouts are not an exotic phenomenon. As much as 95 percent of American consumers have encountered at least one form of self-service checkout option, according to our survey, and 82 percent have used at least one during the past 12 months.

Eighty-eight percent of respondents reported seeing such stations in supermarkets, but they were not the only popular self-service mechanisms. In fact, even if we do not consider those who had only used self-checkout lines at local supermarkets, 62 percent would still have paid with some other related option at least once in the last year. Among these, 33 percent said they had used self-checkout stations at nongrocers like clothing or health and beauty retailers, among others.

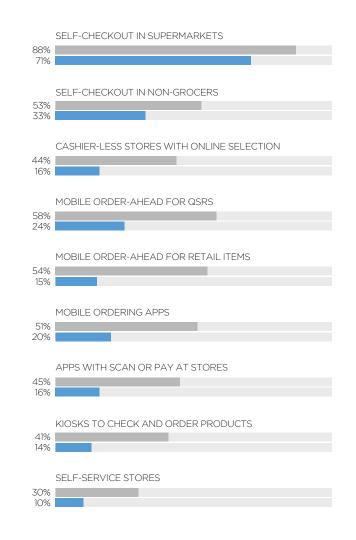
These were the only two self-service payment methods our respondents reported having used. They appeared to have little more than a passing familiarity with alternative self-service checkout options, and most had never actually used them.

Such was the case with cashier-less stores and mobile ordering services. Forty-four percent of respondents had heard of stores without cashiers, but only 16 percent had ever shopped at one. Meanwhile, 58 percent were aware of mobile ordering services, but only 24 percent had ever used them. It appears many self-service options are still the stuff of science fiction to many American consumers.



FIGURE 1: AMERICANS' FAMILIARITY WITH SELF-SERVICE CHECKOUT SYSTEMS

Percentage of sample reporting having heard of and/or used self-service checkout methods



The launch of self-service options like Amazon Go made headlines because it was, and still is, a novel concept in the U.S. and around the world. It is likely that many consumers have never encountered them outside the technology section of their favorite news outlets, but self-service checkout kiosks are available at staples like CVS, McDonald's, Target and myriad others across the nation.

Self-service retail may encompass a wide variety of technologies, but very few are commonly available. Shoppers demonstrably use the self-service options available to them, however, suggesting they may use others if given the chance.



I have used it



DEMOGRAPHIC FACTORS

DETERMINING SELF-SERVICE
CHECKOUT USAGE

Which shoppers are most likely to use selfservice checkout options? Our survey revealed several factors that could influence whether they opt for the payment form.

Younger consumers were more likely to gravitate toward self-service checkouts than older consumers, for example. The average age for our sample was 47, but the average self-service checkout patron tends to be younger: 40 for mobile order-ahead customers and 39 for mobile app scanners.

There was one notable exception. Mobile app users were the oldest, as shown in Table 1, and made up the only group not younger than the control group, on average. These users averaged an age of 47 years, the same as our overall sample.

That said, individuals between the ages of 39 and 47 could be reasonably classified as their own substantively distinct age group.

TABLE 1: DEMOGRAPHICS

Average age, income and education levels of self-service checkout users

Average Age	Average Annual Income	Percentage with College Degrees	
39	\$68K	39%	
39	\$68K	40%	
40	\$63K	38%	
40	\$64K	37%	
41	\$59K	35%	
42	\$68K	41%	
44	\$66K	39%	
45	\$59K	34%	
47	\$63K	38%	
47	\$57K	31%	
	Age 39 39 40 40 41 42 44 45 47	Age Annual Income 39 \$68K 39 \$68K 40 \$63K 40 \$64K 41 \$59K 42 \$68K 44 \$66K 45 \$59K 47 \$63K	

We observed a positive correlation between self-service usage and income. Users' average yearly income for each self-service selection was higher than that of the sample, calculated as \$57,000. The two lowest-income self-service patron groups, each totaling \$59,000, used self-service checkouts at the supermarket and cashier-less stores with an online selection. All other applications' users boasted average annual incomes of \$63,000 or more, and those with the highest — which used self-service stores, mobile app scan and self-service kiosks — all earned an average of \$68,000 per year.

Patrons of self-service checkout retailers also appeared to be more educated that those of retailers without self-service checkout options. Only 31 percent of our sample had attended college, but no self-service checkout platform users averaged a college education level below 34 percent. The users with the highest rate of college education (41 percent) were self-service kiosk patrons.



THE FREQUENCY

WITH WHICH CONSUMERS USE SELF-SERVICE PLATFORMS

Most self-checkout customers used the options at least once per week, with the more "traditional" being used more often. Just under half who had used some form of self-service platform in the past reported using supermarket self-checkout lanes once per week.

There was a steep drop off between supermarket self-checkout usage and the next-most frequently used system, however. The second-most popular self-checkout option was the non-grocer self-checkout system, used by only 18 percent of shoppers once per week.

The frequency with which shoppers use selfservice checkouts suggests there is a very real consumer demand, but this inevitably leads to more questions: What drives demand? What do consumers have to gain from self-service options as opposed to traditional cashiers?

When we asked respondents why they preferred self-service checkouts, nearly 85 percent cited speed, the most commonly

reported reason for preferring them over cashiers.

Other popular reasons for using self-service checkouts include the ability to compare prices or pay for products in advance. These motivators contributed to many shoppers' decisions to use mobile order-ahead platforms and self-service stores.

There is a certain value in the interpersonal interactions which exist with real-life sales associates, though, and self-service technological advancements often lead to replacing cashiers with machines. Some suggest this could drive customers away, but our survey found that the story is more complex.

Customers are real-life people, after all, and most value their time. Our data suggests many may forgo the possibility of chatting with the supermarket cashier if it means saving a few precious minutes.

TABLE 2: FREQUENCY AND REASONS FOR SELF-SERVICE SYSTEM PREFERENCE

Percentage of respondents who used select self-service options with different frequencies, and cited select reasons for doing so

OPTIONS USED	Self- checkout in supermarkets	Self- checkout in non-grocers	Cashier- less stores with online selection	Mobile order-ahead for QSRs	Mobile order-ahead for retail items	Mobile ordering app	Apps with scan or pay at stores	Kiosks to check and order products	Self-service stores
FREQUENCY									
Once a year	0%	0%	0%	0%	0%	1%	1%	0%	0%
Once a week	49%	18%	12%	3%	8%	7%	7%	5%	5%
Once a month	20%	13%	11%	15%	5%	6%	6%	6%	3%
Once a day	8%	3%	3%	1%	3%	2%	2%	2%	1%
A couple times per year	9%	6%	4%	4%	3%	4%	3%	4%	2%
REASONS									
Faster	88%	87%	87%	89%	89%	91%	90%	85%	87%
Line is shorter	64%	65%	57%	62%	62%	62%	62%	59%	57%
Easy to use	60%	62%	66%	69%	70%	70%	70%	62%	68%
More control over the process	40%	43%	51%	46%	47%	43%	52%	48%	52%
Payment is quicker	32%	35%	49%	45%	49%	39%	48%	44%	48%
Avoid store employees	26%	28%	41%	37%	41%	33%	35%	40%	41%
Enjoy new technologies	20%	23%	31%	31%	37%	32%	36%	31%	35%
Easy to compare prices	15%	20%	33%	25%	31%	17%	30%	33%	32%
Pay in advance	13%	18%	31%	30%	33%	25%	26%	25%	33%
Better security	10%	12%	23%	13%	15%	11%	21%	19%	26%
Only method available	3%	5%	6%	5%	5%	5%	5%	5%	7%

Many of our respondents cited speed and convenience when listing what brought them to choose self-service options, and yes, they do believe the methods save them time and help cut down on frustration. In other words, many shoppers perceive real value in self-service options, and merchants offering said options will attract more of them.

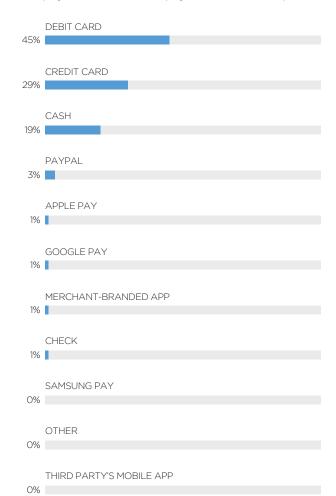


THE PAYMENT METHODS

CONSUMERS USE AT SELF-SERVICE CHECKOUTS



Percentage of respondents who used select payment methods to pay for self-service options



Self-service checkouts are relatively new, and many shoppers still use traditional payment methods to complete their purchasing processes. Ninety-three percent of our respondents reported paying with debit cards, credit cards or cash when shopping at self-checkouts, as seen in Figure 2. PayPal, Apple Pay and Google Pay were among the least commonly used.

93%

of consumers pay with **debit cards** at self-service checkouts.

These figures make sense. Debit cards, credit cards and cash are all well-established, widely accepted payment methods that consumers have been using for decades. In contrast, mobile wallets like Apple Pay and Samsung Pay are still nascent, having launched in the past few years. Apple Pay has only been available to American consumers since October 2014, after all.8 It will likely be some time before such payment options permeate the market to the same extent as credit, debt and cash — if they ever do.

The question is this: Which consumers are currently using alternative payment methods,

driving their slow proliferation, and which remain loyal to cash and credit?

We once again observed correlations between demographic factors and consumers' choice to pay via self-checkout services. Credit and debit cards were more popular among respondents with higher income and education levels, for example, while those with lower levels tended to use cash.

The average income of credit card users was \$76,000 per year, and 55 percent of them had attended college. Conversely, the average age of cash users was only 44, and just 16 percent had attended college.

⁸ Phelan, David. Secrets of Apple Pay on iPhone: The complete how-to guide for reluctant users. Forbes. 2018. https://www.forbes.com/sites/davidphelan/2018/06/11/secrets-of-apple-pay-on-iphone-the-complete-how-to-guide-for-reluctant-users/#327a80fb3c30. Accessed June 2018.

TABLE 3: PAYMENT METHOD Average age, income and education levels of respondents, by payment preference

OPTIONS USED	Average Age	Average Annual Income	Percentage with College Degrees	
Another mobile wallet	30	\$44K	33%	
Apple Pay	34	\$69K	40%	
Samsung Pay	33	\$54K	40%	
Google Pay	33	\$51K	22%	
Other	44	\$28K	13%	
Check	47	\$41K	24%	
PayPal	34	\$49K	27%	
Cash	43	\$44K	16%	
Credit cards	52	\$76K	55%	
Debit cards	47	\$53K	26%	
SAMPLE	47	\$57K	31%	

Additionally, higher-income individuals were more likely to report paying for self-service checkouts using Apple Pay and credit cards than other consumers. The average household income of those who used Apple Pay was \$69,000 per year, a total that reached as high as \$76,000 for credit card users. The sample average was only \$57,000 per year.

These interlacing correlations likely help explain why older respondents and those with higher incomes tended to prefer paying with credit and debit cards — the methods with which they are most familiar — when using self-service checkouts.



SELF-SERVICE RETAIL

RECONNAISSANCE:

CONSUMERS WHO DO NOT USE SELF-SERVICE CHECKOUTS

There is a corresponding counterargument for every positive account of a new technology. An honest assessment of self-service's potential impact on retail must confront the anxiety some merchants have about implementing it — specifically, a fear that such options could scare customers away.

Certain segments — older consumers, the less educated and those with lower incomes — registered as less likely to have used self-checkout systems. It was necessary to inspect these personalities further to gain an understanding of their unique perspectives.

As shown in Table 4, respondents who had not used self-service checkout systems were six years older than those who had, on average. Our sample's average age was 47, and that of the self-service-averse shopper was 53.

TABLE 4: NON-USERS

Average age, income and education levels of respondents who do not use self-service options

OPTION	Average Age	Average Annual Income	Percentage with College Degrees		
Those who don't use self-checkout options	53	\$45K	12%		
SAMPLE	47	\$57K	31%		



19%

of shoppers do not use self-service options because they are **not available**.

Meanwhile, the average household income of shoppers who avoided self-service checkout systems was lower than that of the sample. Respondents averaged approximately \$57,000 per year, with those who had not used self-service averaging around \$45,000. These same shoppers also tended to have lower education levels, with just 12 percent having attended college — 31 percent for the overall sample.

We received responses from both younger shoppers and those with lower incomes who had never used a self-service checkout system. Nineteen percent of shoppers aged 18 to 24 had never done so, nor had 11 percent of individuals in the lowest income bracket (those earning less than \$25,000 per year).

When we asked these consumers why they had avoided self-service checkouts, approximately half responded that they simply preferred receiving employee assistance during the process. In defiance of general trends, these respondents tended to be older and to have higher incomes.

Others said they avoided self-checkout services because "it takes more time," the "information is not safe/secure" or that the options are "not available" at their preferred retailers. Some will not find self-service options appealing, but does this group constitute a large or small portion of the American public? Should they influence a merchant's decision to invest in self-service technology?

TABLE 5: AGE AND INCOME LEVELS OF SELF-SERVICE-AVOIDANT CONSUMERS

Percentage of respondents who do not use self-service options, by age and income

REASONS	Prefer assistance from employee	It takes more time	Information is not safe	Not available	Could be charged wrong amount	Difficult to use	Leads to spending too much money
NOT USING THEM							
Total	50%	24%	21%	19%	18%	12%	7%
AGE							
65+	68%	21%	21%	11%	20%	12%	7%
55 - 64	60%	28%	25%	17%	21%	12%	1%
45 - 54	38%	38%	16%	22%	14%	10%	4%
35 - 44	44%	29%	18%	24%	15%	0%	3%
25 - 34	31%	11%	17%	33%	19%	28%	17%
18 - 24	21%	16%	23%	21%	7%	12%	19%
INCOME							
\$150K+	71%	43%	14%	14%	14%	0%	0%
\$100 - 150K	65%	27%	15%	23%	8%	8%	0%
\$75 - 100K	52%	30%	36%	24%	27%	15%	3%
\$50 - 75K	59%	26%	24%	13%	17%	17%	9%
\$25 - 50K	55%	25%	19%	18%	16%	12%	5%
Less than \$25K	40%	20%	19%	19%	19%	12%	11%



THE BOTTOM LINE:

HOW SELF-SERVICE CHECKOUT ALTERS COMMERCIAL VIABILITY

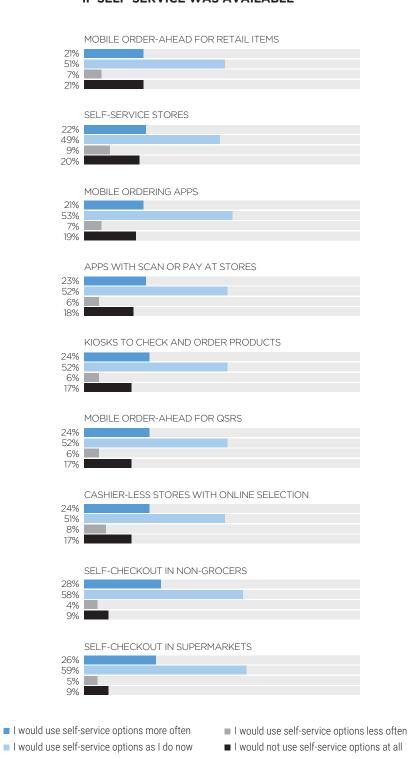
As proven by smart hairbrushes and Bluetooth-capable toasters, using technology just because it is available is not always a good idea. Self-service payment options have advanced far beyond the supermarket checkout line, but do they appeal to real-life consumers? Or, are they simply another merchant-driven ploy to reduce labor costs?

Though certain consumer segments steer clear of self-service, the data suggests that a greater portion of shoppers do, in fact, appreciate the availability of such payment options. Most prefer the solitude of using technology-based self-service systems to the hassle of dealing with real-life store associates, even preferring to scan items themselves instead of asking an employee to help them do so.⁹ It would not be far-fetched, then, to presume that installing self-service would help merchants attract more customers.

Data collected in PYMNTS' latest survey supports this conclusion. We asked respondents if they might frequent a hypothetical merchant more often if self-service options were made accessible. Twenty percent said they would not use any form of self-service checkout, but 80 percent said they would.

Among that 80 percent, most respondents said they would shop with merchants about as often as they do now if offered self-service checkout, and a greater percentage said they would shop more than said they would shop less. The precise portions varied by system, however, as seen in Figure 3.

FIGURE 3: RESPONDENTS WHO WOULD BE MORE LIKELY TO SHOP WITH A MERCHANT IF SELF-SERVICE WAS AVAILABLE



⁹ Author unknown. More shoppers want customers service from gadgets over humans. Reuters. 2018. https://www.reuters.com/article/us-usa-retail-service/more-shoppers-want-customer-service-from-gadgets-over-humans-study-idUSKBN1GV19X. Accessed June 1028.



It appears supermarket and non-grocer self-checkouts were in particularly high demand among our respondents, with 28 and 26 percent, respectively, saying they would frequent a merchant more often if it introduced self-service payment options. Approximately 59 percent said these options would not compel them to visit supermarkets more frequently than they currently do, as did 58 percent of those who shopped non-grocers. Just 9 percent of supermarket shoppers said they would not use self-checkout systems at all, and the same number said it would not use the systems at non-grocers.

Self-service checkout options at supermarkets and non-grocers appeared to be the most popular among respondents, but others were not far behind. Twenty-one percent of respondents expressed interest in ordering ahead via mobile device, for example, saying they would visit any merchant offering such a service more frequently, and 51 percent said it would have no affect on their shopping habits. This was the self-service option about which our respondents were least enthusiastic, and yet 72 percent had either a favorable or neutral attitude toward it.

Conversely, we observed a small portion of respondents who expressed an active dislike

or indifference toward self-service checkouts. Again, the exact percentage varied by the type of service. Some consumers appeared hostile to the idea of more self-service checkouts at supermarkets and non-grocers. Just 9 percent said they would not use the options, while those at 5 and 4 percent, respectively, said they would visit less often if it were to install self-service checkouts.

As expected, mobile order-ahead features inspired the most negative reactions from our respondents, but naysayers who would visit a merchant less because of the offering only accounted for 7 percent of the total sample. Meanwhile, approximately 21 percent stated they would simply not use the option.

These figures demonstrate that a sizeable portion of consumers have a favorable view of self-service checkout systems, a portion which outweighs that of shoppers who prefer to avoid them. It stands to reason that many merchants would benefit from offering self-service options, as they would likely attract more consumers than they would deter.

If these statistics are any indication of consumer demand, we can safely expect far more commercial investments in self-service checkout systems going forward.

CONCLUSION

The U.S. has boasted a thriving service-based economy for decades, so the rise of self-service retail represents a stark shift in the way its citizens think about customer service. When they demand the speed, convenience and control they can only achieve with self-service payment options, then quality customer service entails the proper implementation of those payment options.

As a result, self-service retail is swiftly evolving with the technological norms of our time. More than merely a top-down, cost-saving conspiracy, as some skeptics contend, self-service payment is an extension of the near-constant interconnectedness and widespread access to internet-capable smart devices.

As consumers gain more power to control their shopping and payment options, their demand for quick, reliable service will likely continue to permeate the service sector — and fuel the drive toward self-service retail. It appears the question is not whether self-service options will become more ubiquitous in the future, but how effectively merchants can implement them.

