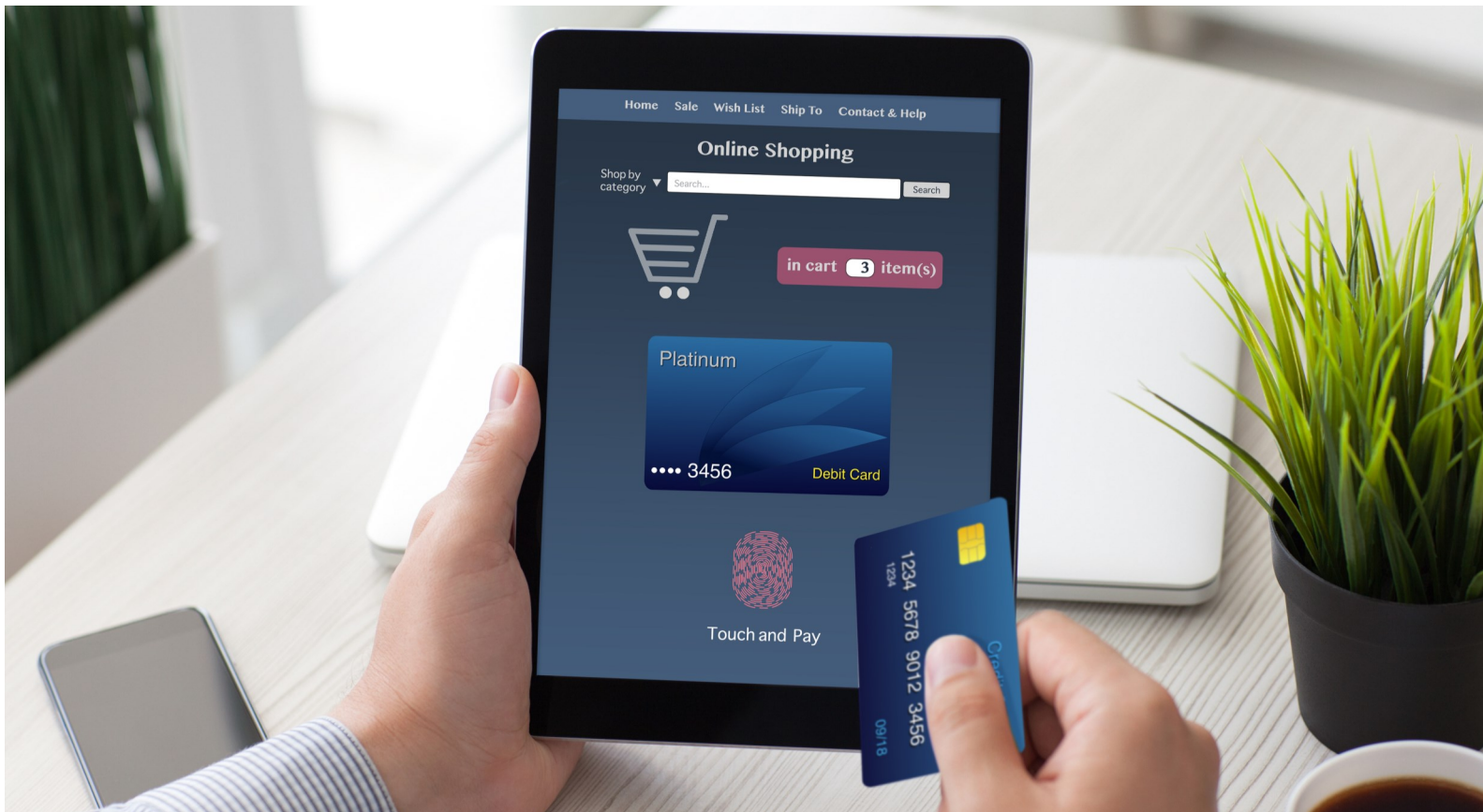


# THE CREDIT UNION GUIDE TO OPPORTUNITIES IN IOT, BIOMETRICS, AND E-COMMERCE

August 2017



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## FOREWORD

This white paper discusses how the Internet of Things (IoT), connected payments from IoT devices, and new banking technologies, such as biometrics, are impacting the financial services industry. It also provides a view to the future of banking and how they will create new opportunities and pose potential customer attrition threats to financial institutions (FIs). The paper segments the banking industry into four categories based on where a consumer has his or her primary financial relationship: giant bank, regional bank, community bank, and credit union (definitions and survey methodologies described in detail at the end of the paper in the methodology section).

A great deal of the paper illustrates consumers' willingness to adopt new technologies such as voice banking and usage of existing technology such as fingerprint authentication on mobile banking. It also examines mobile wallet adoption and top reasons for not using mobile banking. One key, pervasive theme is that customers of giant banks are more willing to adopt the latest technologies and tend to have higher ownership rates of smart devices such as smartphones, fitness bands, and smartwatches. In contrast, credit union members appear to lag or be at par with the general population in a number of categories, such as smartphone ownership and usage of fingerprint authentication.

One key driver behind this theme is potentially that credit union members tend to prefer having a personal relationship with their FI over using technology. For example, among non-users of mobile banking, 38.9% of credit union members report "I prefer dealing with people," compared with 34.1% in the general population. Further, skepticism for new and unproven technology such as voice banking is high among credit union members, with 35.5% stating they do not feel it is secure, compared with just 29% of the general population.

Slower adoption rates and lower willingness to use the latest technology should be viewed as both potential opportunity and challenge. The opportunity rests with how credit unions introduce these new technologies and features to their members in a considered way that does not take away from the desired personal relationship. The challenge is that as new technologies become proven and mainstream, credit unions must be able to offer them to their members or else face potential attrition. The caveat is that as IoT devices such as smart homes, smart refrigerators, self-driving cars, and digital assistants (e.g., Alexa) become mainstream in the next two to three years, credit unions may be forced to move at a quicker pace to get in front of the impact on their membership in order to remain the primary FI.

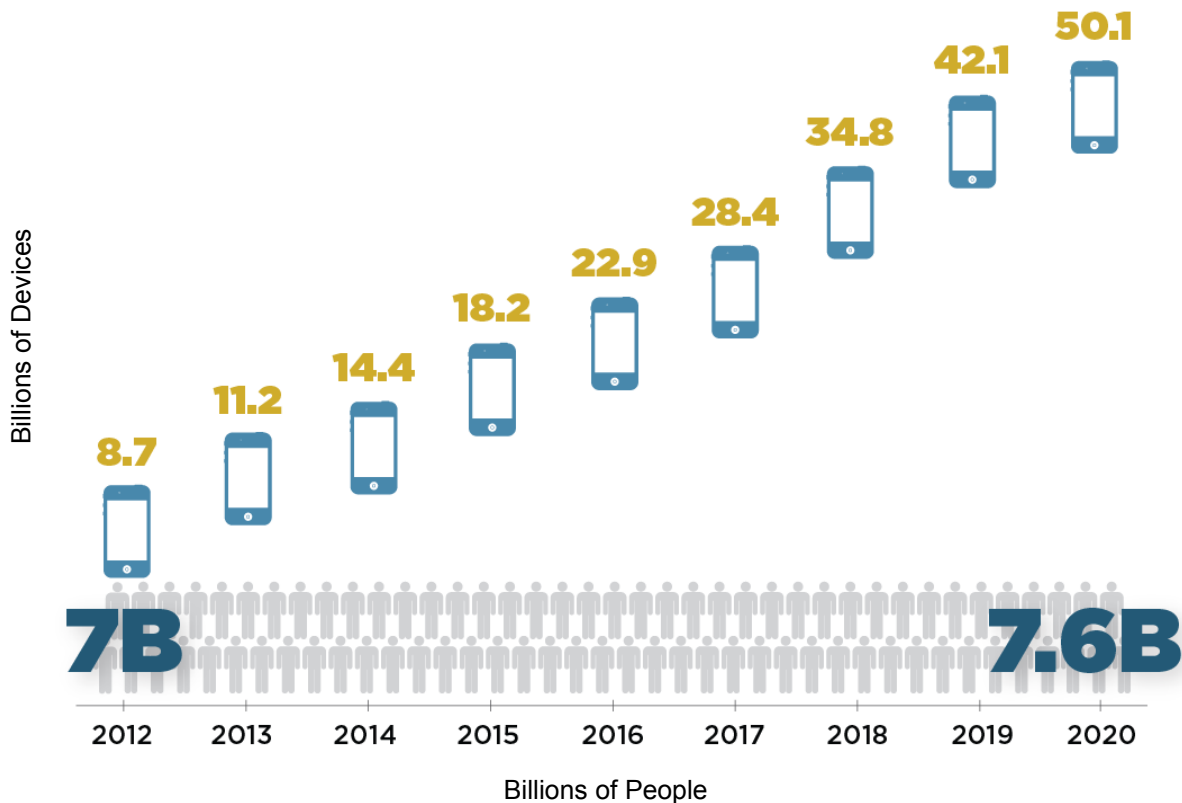
## INTERNET OF THINGS (IOT) AND CONNECTED PAYMENTS

The explosion of the Internet of Things, or IoT, represents a massive opportunity for credit unions to capitalize on connected payments. The growth of the Internet has gone significantly beyond the devices normally thought to be used to access it, such as PCs, laptops, mobile phones, and

tablets. Numerous devices connect to measure, respond, and perform functions on our behalf, often operating in the background without our knowledge. These devices include items such as dishwashers, refrigerators, parking meters, homes, automobiles, cargo ships, and much more. In fact, there are more connected devices today than there are human beings on the planet. By 2020 there will be more than 50 billion connected devices deployed worldwide — approximately 6.6 devices per person (Figure 1).

### By 2020 There Will Be 50 Billion Connected Devices — 6.6 Devices for Every Person on the Planet

Figure 1: Number of Globally Connected Devices and People



Sources: U.S. Census; The Connectivist Using Cisco Data

The development of IoT has led to the connected payments phenomenon, in which devices connected to the Internet make purchases on our behalf. These are generally set up as “autofill” orders. For example, a Samsung washing machine might be programmed to sense when detergent in the house is running low, based on the number of loads it has completed, and to reorder Tide detergent using Amazon Prime. The owner has permitted the washing machine to reorder supplies when it runs low and is notified when a new order is placed, typically by email. This act of an IoT device placing an order on the owner’s behalf, operating in the background, is a connected payment. The opportunity to benefit from these transactions rests with the financial institution (FI) whose debit or credit card is tied to the device’s purchases or transaction account, in this case Amazon.

The range of connected devices is wide and continues to grow. Some of these devices, such as an Amazon Dash Button or a smart parking meter, require human intervention to make purchases. In other cases, such as a connected washing machine or refrigerator, devices may run on an autofill basis, sensing when consumable items such as detergent or milk are running low and reordering them. Finally, the development of self-driving cars will lead to vehicles driving themselves to a service facility for an oil change while the owner is at work — paying for the maintenance and road tolls without the owner taking any action. These connected devices will change how credit union members pay for things in their everyday lives (Figure 2).

**The Types of Payment-Enabled Connected Devices Are Diverse and Growing**

Figure 2: Connected Devices Currently Available to Make Purchases



In an effort to maintain some level of order and minimize fraud risks, biometrics will increasingly be leveraged to provide user authentication and approval for purchases. A digital assistant such as Alexa from Amazon will need to verify individual users based on voice recognition in order to carry out certain tasks, such as transferring money or

paying bills. New home locks from companies such as DoorBird are using facial recognition to unlock the front door (Figure 3). This allows only authorized users to enter a home but does not require the homeowner to be present or to verify a person's identity, since this will have been done during the video doorbell's installation.

### Facial Recognition Is the Key to Unlocking a Home's Front Door

Figure 3: DoorBird Locking System



Source: DoorBird

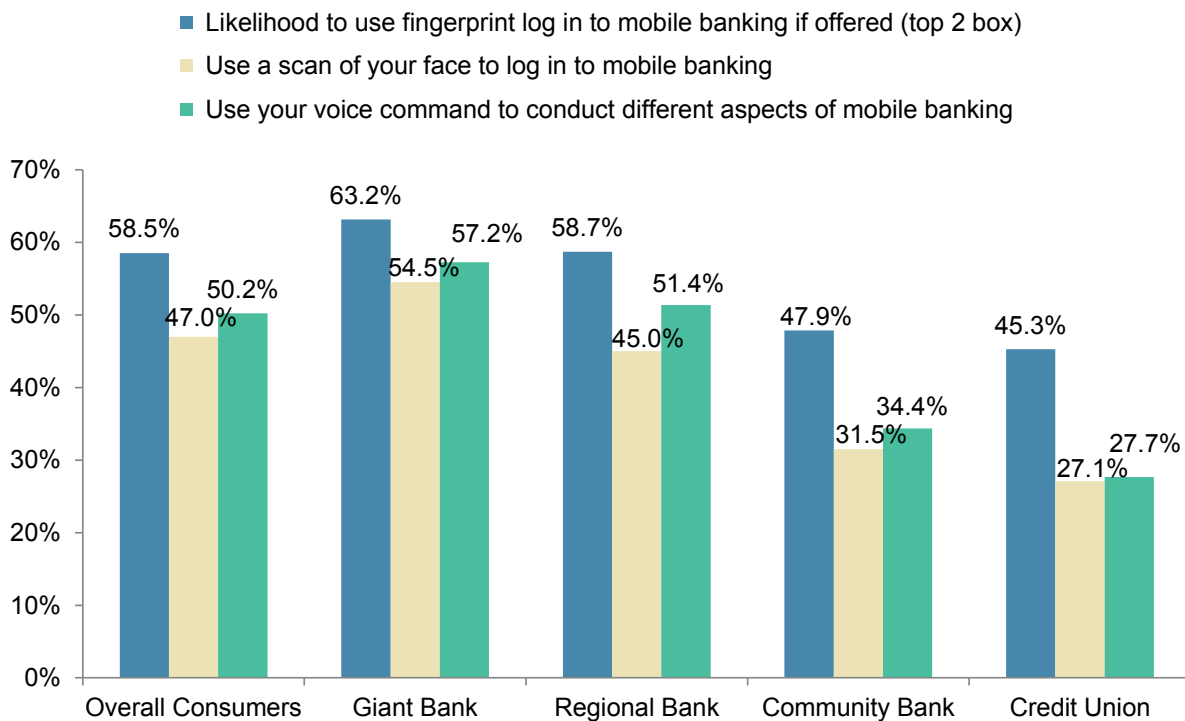
## ADOPTION OF NEW BIOMETRICS

While most consumers express a strong interest in adopting new biometric authentication methods as a way to log in to their mobile banking application, credit union members lag behind customers of larger banking institutions. Almost 6 in 10 (58.5%) overall consumers state that they would use fingerprint authentication to log in to mobile banking, while half (50.2%) would use their voice, and almost half (47.2%) would use a facial scan for logging in (Figure 4). Customers

of giant and regional banks express the highest levels of interest in these new biometric authentication methods. Credit union members express the lowest levels of interest in biometrics, which could be a cause for concern, particularly when credit unions are considering investing in these new technologies to keep up with current banking industry trends (Figure 4). On a positive note, interest in fingerprint authentication among credit union members is almost double the interest in facial scan authentication — 45.3% vs. 27.1%.

### Giant and Regional Bank Customers Are Most Interested in Biometric Authentication

Figure 4: Likelihood to Use Biometrics for Banking, Top Two Box Scores



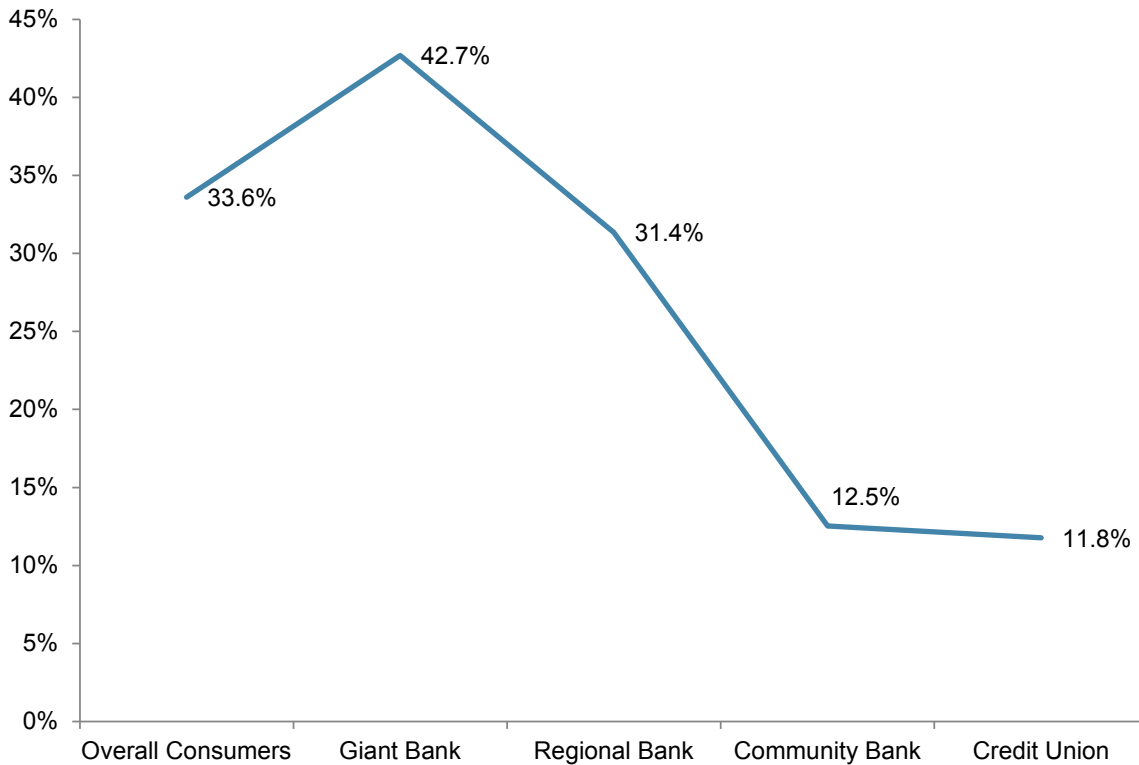
Source: Javelin Strategy & Research, 2017

Credit unions have an opportunity to drive fingerprint authentication adoption for mobile banking as their members have the lowest rate of use (Figure 5). Over 4 in 10 (42.7%) giant bank customers have used fingerprint authentication in the past 30 days to log in to their mobile banking, compared with just 1 in 10 (11.8%) of credit union members. Only community bank customers have adoption

levels similar to those of credit union members — 12.5% vs. 11.8%. The importance of driving adoption of fingerprint authentication cannot be overstated. The technology has been in the marketplace for several years and is used by a variety of industries beyond financial services. It is a proven technology that is often considered a stepping-stone to more advanced biometrics such as facial recognition.

### Giant Bank Customers Are Active Users of Fingerprint Authentication

Figure 5: Percent of Mobile Bankers Using Fingerprint to Log In, Past 30 Days



Source: Javelin Strategy & Research, 2017

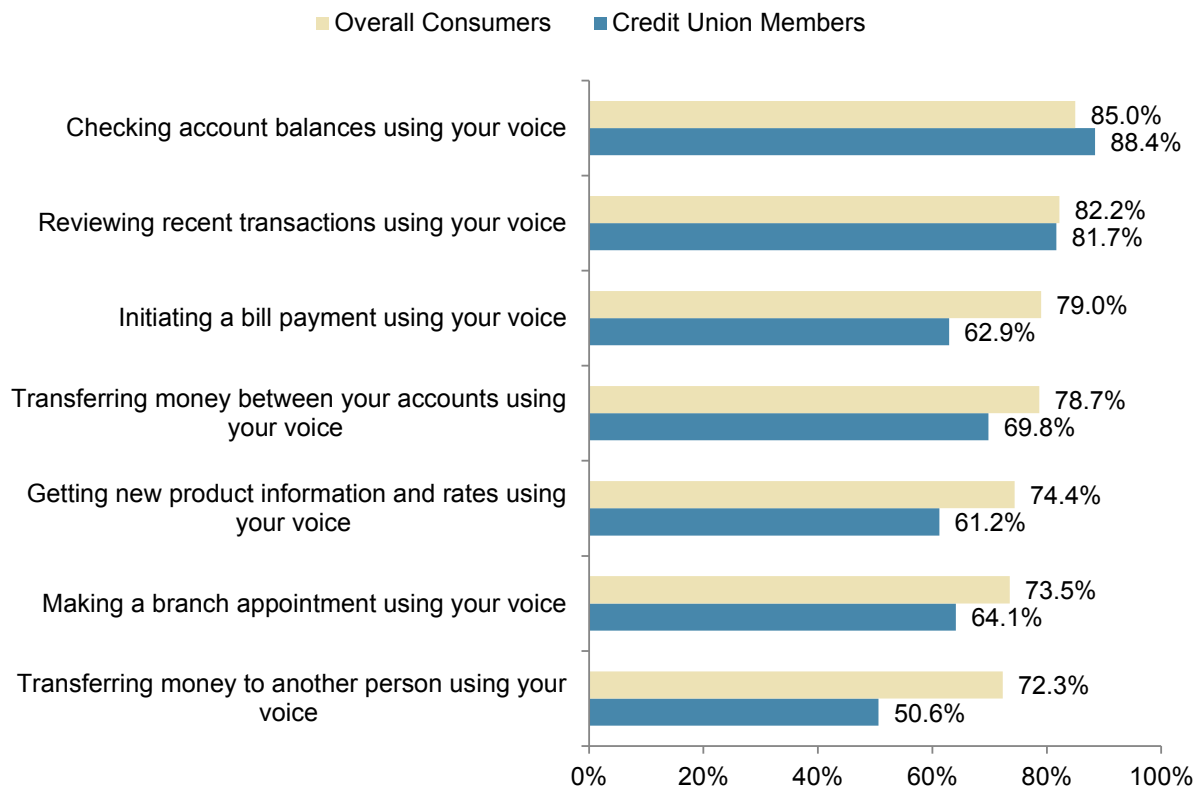


The rise of digital assistants in homes and on mobile phones is creating an opportunity for financial institutions to deploy voice-based banking. The growth of digital assistants such as Apple’s Siri is familiarizing consumers with the ability to use voice commands to engage in a variety of functions such as conducting an Internet search, getting driving directions, or sending money to someone via PayPal. Credit union members state that their primary use of voice-based

banking would be to check their account balances (88.4%) and review recent transactions (81.7%) (Figure 6). However, credit union members are less likely than the general population to engage in proactive actions such as initiating a bill payment using their voice (62.9% vs. 79.0%) or transferring money between their own accounts (69.8% vs. 78.7%).

### Credit Union Members Would Use Voice Banking Mainly for Checking Balances

Figure 6: Top Uses of Voice-Based Banking, Overall Consumers and Credit Union Members



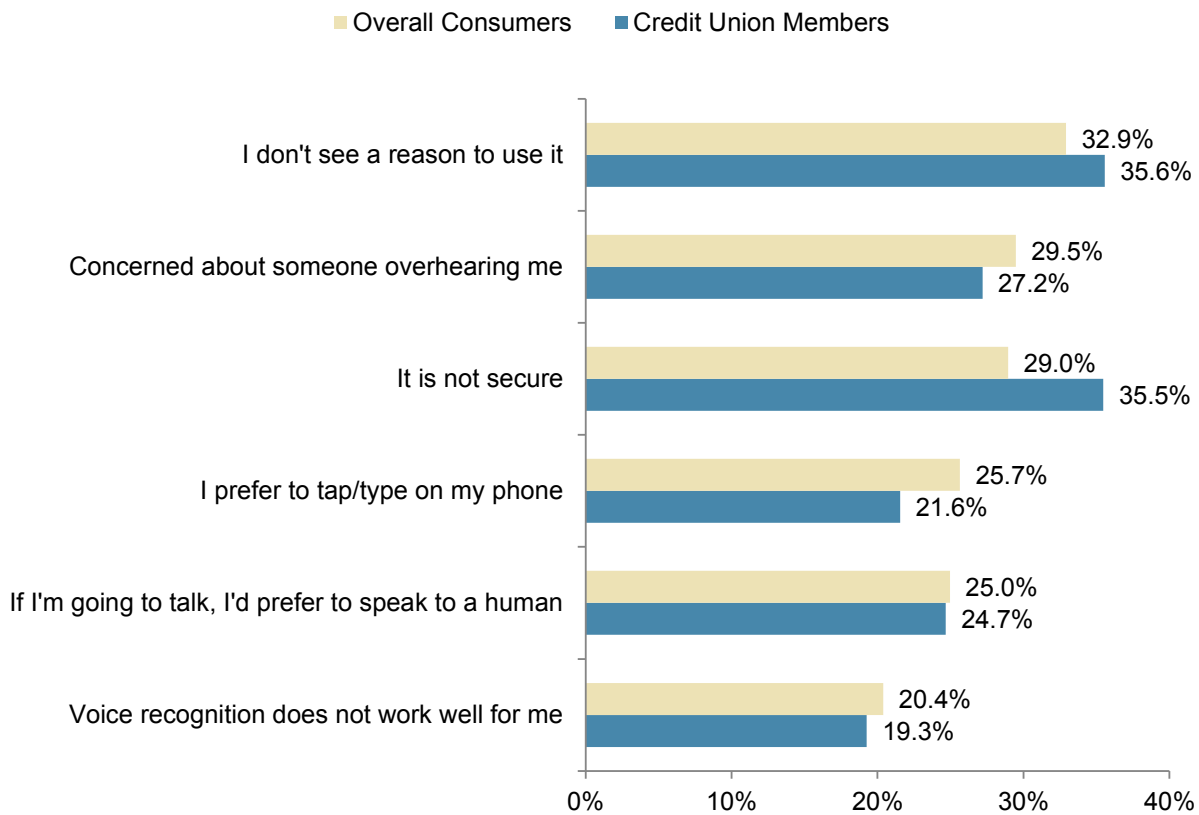
Source: Javelin Strategy & Research, 2017

Lack of perceived value (similar to overall consumers) and lack of security (statistically different from overall consumers) are top reasons credit union members say they would shun using their voice to control their mobile banking sessions. In fact, credit union members believe using voice to control mobile banking sessions is not secure, 35.5% vs. 29.0% (Figure 7). Recent media stories of children using Amazon’s Alexa to order toys and food only serve to

support the reality that voice-based authentication still has many steps that need to be covered before it can be proclaimed a secure method of recognition. However, voice-based banking is an area where the financial services industry is spending heavily in the belief that artificial intelligence-supported digital assistants will stem customer attrition and lead to increased cross-selling opportunities.

### Credit Union Members Don’t See the Value in Voice Banking

Figure 7: Reasons for Likelihood Not to Use Voice to Control Mobile Banking



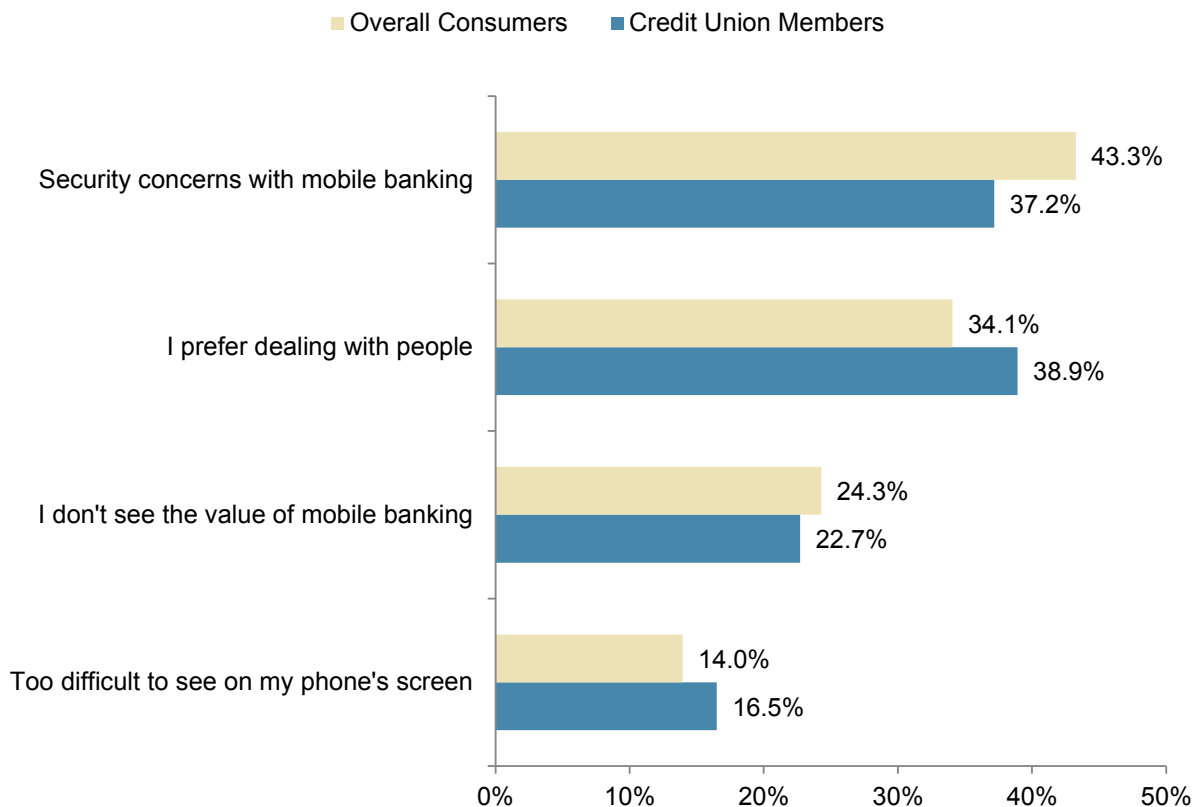
Source: Javelin Strategy & Research, 2017

Credit union members who do not use mobile banking appear to have a higher preference for dealing with people over using the technology, which can be both an opportunity and a challenge. Among non-mobile banking users, 38.9% of credit union members state the primary reason is “I prefer dealing with people,” compared with 34.1% of overall consumers. In contrast, among the general population that does not use mobile banking, the primary reason is that they believe it is not secure — 43.3%, vs. just 37.2% of credit union members. The reality is that non-

mobile banking credit union members prefer to deal with people to conduct their banking activities (Figure 8). This could be a potential opportunity as digital assistants become more pervasive in everyday life and, with artificial intelligence, take on more humanlike qualities. Could the credit union members’ desire to deal with people be met by digital assistants? Further, this desire to deal with people can allow credit unions to be more thoughtful in how they drive adoption of mobile banking among their members.

**Non-Mobile-Banking Credit Union Members Would Rather Deal with People**

Figure 8: Reasons for Not Using Mobile Banking, Credit Union Members and Overall Consumers



Source: Javelin Strategy & Research, 2017

## ADOPTION OF WEARABLES AND MOBILE/SOCIAL USAGE

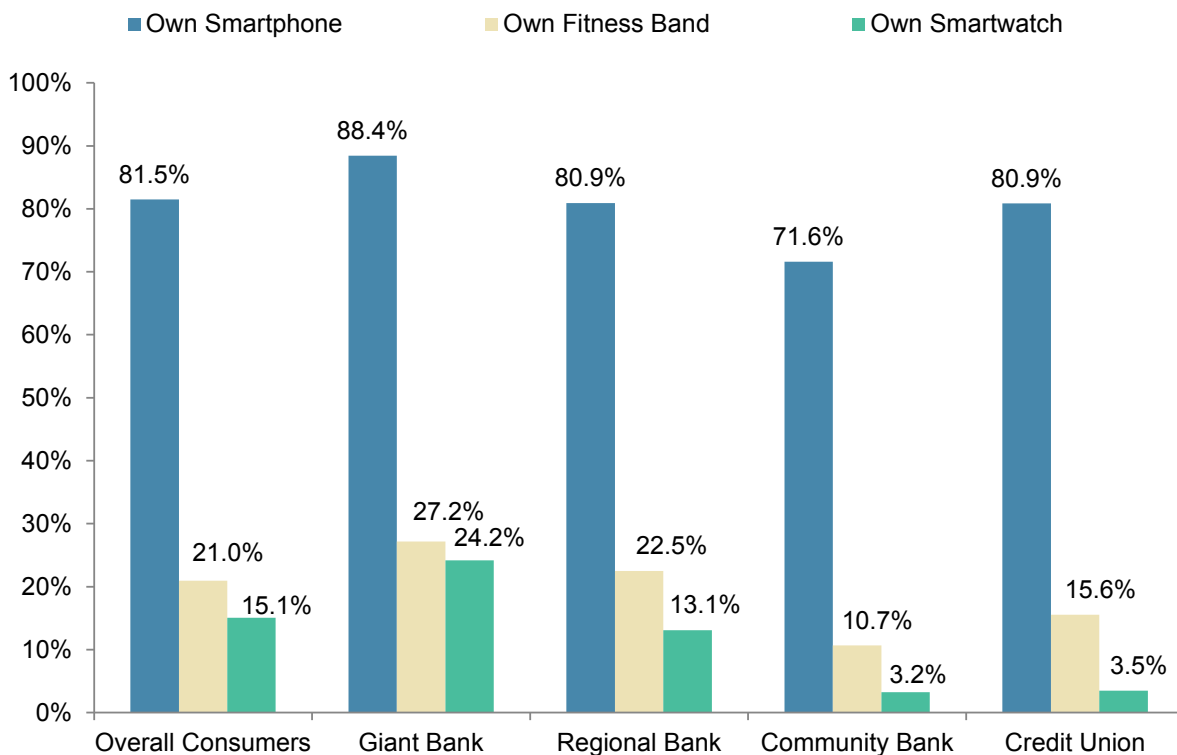
Credit union members trail in wearable technology ownership, with fewer than 1 in 20 (3.5%) owning a smartwatch and just over 1 in 7 (15.6%) owning a fitness band. In comparison, roughly 1 in 4 giant bank customers owns a smartwatch (24.2%) or a fitness band (27.2%). While these wearable technologies are critical to expanding the usage of mobile payments, credit unions need not be overly

concerned, as their members are heavy users of smartphones. Credit union members are almost as likely to own a smartphone (80.9%) as customers of competitive banking institutions, with the exception of giant bank customers (88.4%) (Figure 9).

While credit union members have strong ownership levels of smartphones, they lag in the adoption and use of the mobile wallet feature that is now standard in all new smartphones. Only 1 in 10 (10.8%) credit union members

### Credit Union Members Trail in Wearable Technology Ownership

Figure 9: Smart Device Ownership by Primary Banking Relationship Type



Source: Javelin Strategy & Research, 2017

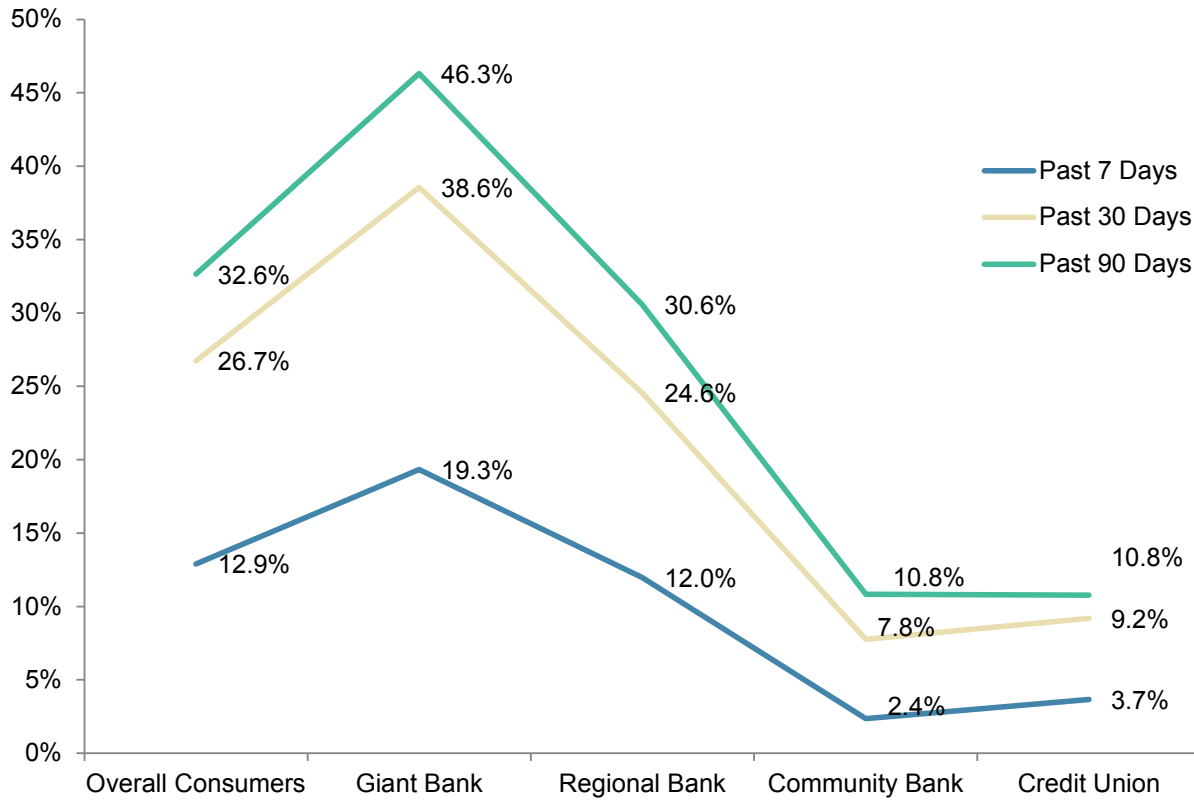
has used a mobile wallet in the past 90 days, compared with almost half (46.3%) of giant bank customers (Figure 10). While credit union member use is relatively on par with community bank customers, it is the gap with regional and giant bank customers that leaves credit unions vulnerable. As mobile wallet use at point of sale (POS) in physical stores continues to grow, credit union members will eventually become tempted to start using them at places such as Trader Joe’s, Whole Foods, and Jamba Juice.

It is important to recognize that mobile wallets are used not only in stores, but also to make purchases within mobile

applications and the mobile web using merchants such as Pinterest, Gametime, and iTunes. Therefore, not having a Starbucks or Trader Joe’s in a rural location does not impede a consumer from using a mobile wallet. In fact, as commerce continues to grow in the mobile channel, many merchants are offering the ability to use a mobile wallet such as Apple Pay as a way to make a purchase since it is much easier than having a consumer enter a credit card number on a mobile device. The key challenge for credit unions will be persuading their members to load their mobile wallets with the credit union’s debit and credit cards instead of those from another banking institution.

**Credit Union Members Lag in Mobile Wallet Adoption**

Figure 10: Use of Mobile Wallets (e.g., Apple Pay) to Make a Purchase in a Physical Store



Source: Javelin Strategy & Research, 2017

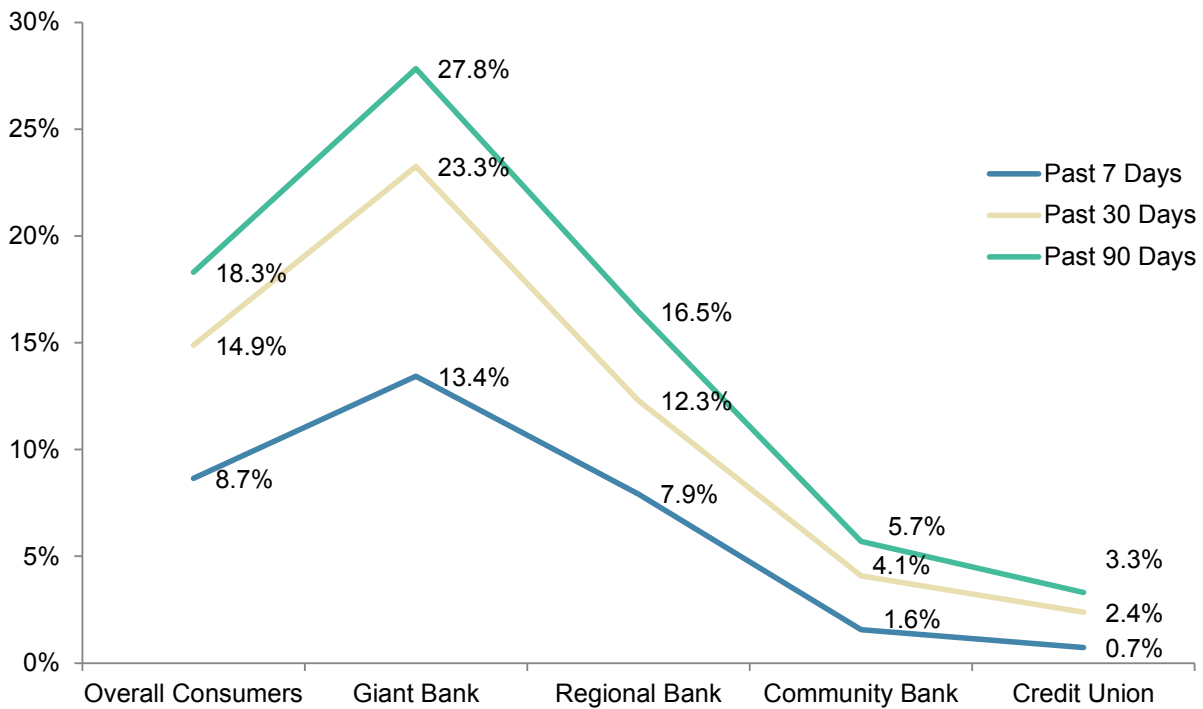
Adoption of social media payment methods such as “buy buttons” is almost nonexistent among credit union members but more common among customers of larger banking institutions. More than 1 in 4 (27.8%) giant bank customers have made a social media purchase using a buy button, compared with fewer than 1 in 20 (3.3%) credit union members in the past 90 days (Figure 11). This shopping technology has been enabled on most major social media websites since 2015. It is designed to drive one-touch impulse purchases while a consumer is consuming social media. For example, Facebook has enabled buy buttons on its newsfeed, Pinterest has “buy pins,” and Instagram has embedded buy buttons as well. The key difference in buy buttons is that they enable a

consumer to make purchases without having to leave the social media website.

Should credit union members begin to discover and use social media buy buttons, it is important to recognize how payments are enabled. If a buy button is used while on a smartphone, one of the payment options offered is the mobile wallet, such as Apple Pay on an iPhone. The alternative is to add a payment card to the social media website. Since some consumers may be reluctant to load a credit card onto Facebook, using the mobile wallet can be an attractive alternative. This raises the importance of getting a credit union’s debit or credit card loaded into the mobile wallet as not all purchases are conducted at physical POS.

### Social Media Buy Button Purchases Nearly Nonexistent Among Credit Union Members

Figure 11: Usage of Social Media Buy Buttons, by Primary Financial Institution Type



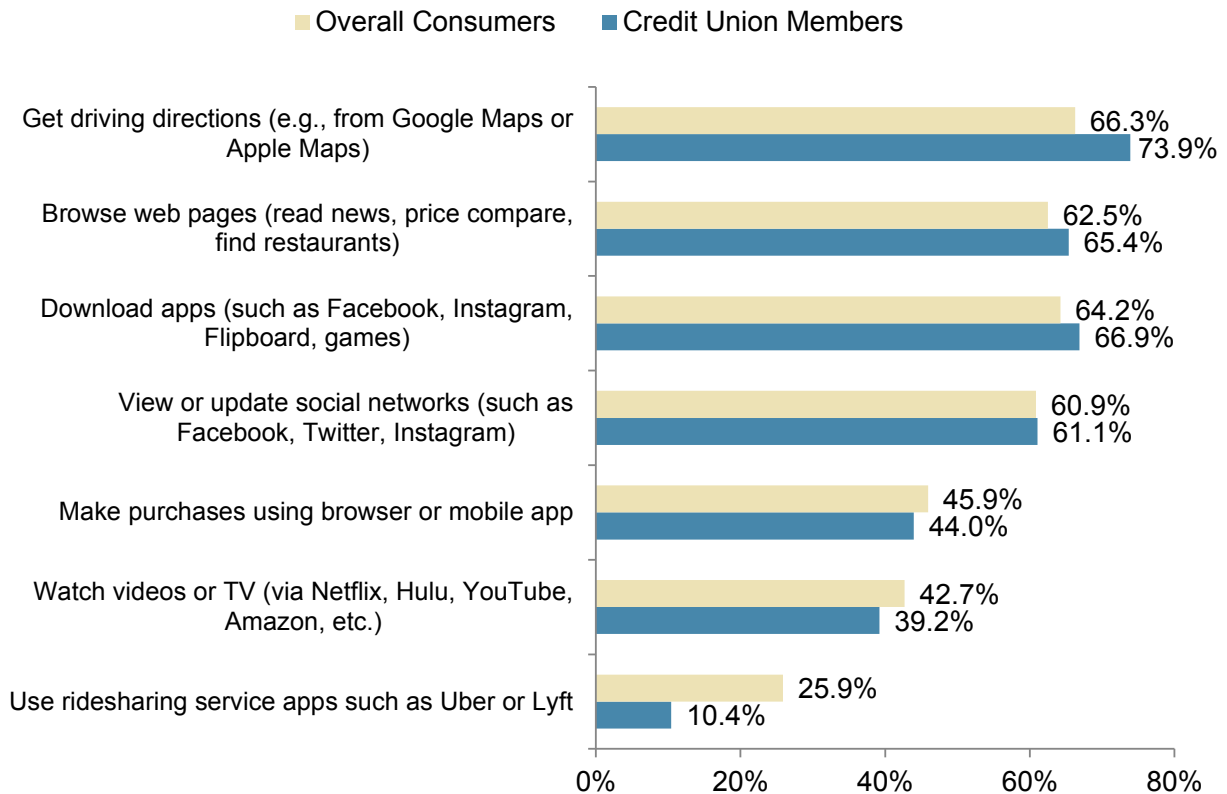
Source: Javelin Strategy & Research, 2017

Despite low levels of mobile wallet and social media payment adoption, credit union members are active users of their smartphones. Credit union members engage in activities such as obtaining driving directions, browsing the web, downloading apps, and updating their social media profiles at similar or statistically significant higher levels than the overall consumer population. Only when it comes to hailing a ride-sharing service such as Uber do members lag behind the general population (Figure 12). This

difference could be for some reason other than desire to use a ride-sharing service. For example, credit union members may have higher car ownership rates or live in more rural areas, since they clearly demonstrate smartphone use on par with or greater than the general population. Most important, members actively use their phones to make purchases (44%), and this represents an important opportunity for credit unions to earn interchange fees.

### Credit Union Members Are Actively Engaged with Their Smartphones

Figure 12: Mobile Phone Activities, Credit Union Members and Overall Consumers



Source: Javelin Strategy & Research, 2017

## RECOMMENDATIONS

**Credit unions need to get their members to adopt a “set it and forget it” payment preference for all new connected devices and mobile wallets.** Promote the credit unions’ payment cards (debit and credit) as the preferred payment method, allowing members to concentrate their digital spend with their primary FI (the credit union) and have the greatest control over their cash flow. It also allows the credit union to capture payments volume without having to be on the leading edge of technology. Getting members to initially sign up with their credit union credit card as the payment choice (“set it”) for each new connected technology adopted (e.g., smart washing machine) creates an obstacle for competitors due to the mindset of the consumer to “forget it” when it comes to changing the preferred payment method. Only in cases of dissatisfaction or an extreme competitive reward offer will a consumer go back into setup to change a payment preference. The same holds true for mobile wallets. A card set up as the preferred payment choice for a mobile wallet is unlikely to be changed unless the consumer is compelled to change it. This “set it and forget it” approach can be a powerful tool for credit unions that does not require them to invest heavily in technology. Rather, it becomes more of an educational awareness program that can be accompanied by small, one-time incentives to be effective.

**Credit unions need to drive mobile wallet adoption among their membership.** It is no longer a question of “if” a member will use a mobile wallet but a question of “when.” In order to get ahead of the game, the credit union needs to provide the education in how to use the wallet and the incentive to drive its payment cards into that wallet. Once the card is in the wallet, the consumer mindset is one of “set it and forget it” as described earlier, which will make the credit union card highly unlikely to be displaced or be moved to the secondary position in the wallet.

**Develop a strategy to drive credit union cards as the preferred payment choice for six key companies due to their size and relation to digital payments.** Instead of trying to chase every digital dollar being spent, credit unions need to focus their efforts on only six key players:

1. **Amazon** is the largest e-commerce player and has deployed Alexa, its digital assistant, to control connected device payments
2. **Walmart** is the largest physical point of sale merchant that has deployed its own wallet and is investing heavily in e-commerce
3. **Samsung**, a leader in digital technology and IoT devices with its own wallet, is positioned to perform well in tomorrow’s connected home
4. **Apple**, a key wallet player, is gaining power in the connected world and soon deploying its digital assistant for the home
5. **Google**, which is investing heavily in IoT, the connected home (e.g., Nest), and Android Pay/Google Wallet, is critical to future adoption for credit union members
6. **Facebook**, the largest social media site and owner of Instagram, is investing heavily in e-commerce.

Credit unions need to single out these six companies as critical to driving their future payment strategies. Instead of chasing down eBay, Twitter, CVS, Walgreens, etc., in an effort to gain every digital dollar, it is imperative that the focus is placed on these six companies, which are likely to control the majority of digital dollars spent in the near future by all consumers, including members. By promoting their cards as preferred payment choices, combined with a “set it and forget it” approach, credit unions can position themselves to capture significant payment volume from IoT, e-commerce, and mobile wallets without having to invest heavily in new technology.



**Credit unions need to consider using education to drive adoption of more advanced banking technologies among their members in combination with the desire for a face-to-face relationship.** The desire for members to “prefer working with people” and having a face-to-face relationship presents an opportunity for credit unions. For example, they can use this personal touch to explain how fingerprint biometrics can be used as an improved method of authentication for mobile banking login. Credit unions

should also consider how they deploy these new technologies in light of members’ desire for human interaction. This could be as simple as hosting mobile banking 101 sessions at a branch. Or it could be more sophisticated, such as deploying a button on a mobile banking app to call a live agent during a mobile banking session if the member desires to switch from tapping on a phone to speaking with a human being.

## METHODOLOGY

The consumer data in this report was primarily collected from the following two surveys:

- A random-sample survey of 3,200 respondents conducted online in October 2016. The overall margin of error is +1.74 percentage points at the 95% confidence level. The margin of error is larger for subsets. The sample is nationally representative of all consumers.
- A random-sample panel of 3,182 consumers collected online during July 2016. The overall margin of sampling error is  $\pm 1.74$  percentage points at the 95% confidence level. The sample is nationally representative of all consumers.

The analysis of financial institutions (FIs) by size was based on where consumers maintain their primary banking relationship. Note that consumers often have multiple relationships with various FIs; however, they can have only one primary relationship. FIs were divided into four categories determined by total deposits as of December 31, 2015, according to rankings by American Banker:

- **Giant national banks:** deposits greater than \$750 billion (JPMorgan Chase, Bank of America, Wells Fargo, and Citigroup)
- **Large regional banks:** \$30 billion to \$750 billion in deposits
- **Small regional or community banks:** less than \$30 billion in deposits
- **Credit unions:** all credit unions

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**Author:** Michael Moeser, Director of Payments

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