Consumer Experience at the Contactless Point-of-Sale

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About the U.S. Payments Forum

The U.S. Payments Forum is a cross-industry body focused on supporting the introduction and implementation of EMV chip and other new and emerging technologies that protect the security of, and enhance opportunities for payment transactions within the United States. The Forum is the only non-profit organization whose membership includes the entire payments ecosystem, ensuring that all stakeholders have the opportunity to coordinate, cooperate on, and have a voice in the future of the U.S. payments industry. Additional information can be found at http://www.uspaymentsforum.org.

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1. Introduction

Contactless payments, which are common around the globe, have typically emerged as a result of the convergence of three trends: maturing acceptance of contactless at the point of sale; nascent but growing issuance of contactless-enabled cards; and consumer readiness for contactless payments.

Contactless payments, which can be made using enabled cards or mobile wallets, use radio frequency (RF) to transmit payment information from a device to a terminal. While many consumers are familiar with making contactless payments with Near Field Communication-enabled mobile wallets, it is less well known that contactless payments can also be made with contactless-enabled credit and debit cards. EMV®[1] chip cards that have an embedded antenna can be used for contactless, contact chip, or magnetic stripe payments.

Despite the current low adoption of contactless payments, adoption is expected to accelerate in the near future due to a number of reasons:

1. **Acceptance is maturing**. According to Visa, more than 60% of face-to-face Visa transactions occur at contactless-enabled merchants as of December 2018.[2] In addition, most point-of-sale (POS) terminals installed with the U.S. EMV migration have the hardware capability to process contactless transactions. Additionally, several U.S. transit agencies are moving to open contactless payments, which is expected to drive consumer habituation for contactless payments.
2. **Issuance is beginning to accelerate.** Several large financial institutions have begun offering contactless cards, including J.P. Morgan Chase, Capital One, American Express, Discover Network, and Citi (with the Costco card). Visa estimates that, by the end of 2019, 100 million contactless Visa cards will have been issued; Mastercard has stated that it has agreements with its bank partners that will bring contactless cards to customers and account for two-thirds of Mastercard's total payment volume within two years.[3]
3. **Consumers are interested**. Around the globe, once contactless acceptance and issuance reached critical mass, consumer adoption followed rapidly. An illustrative example is Russia, where contactless penetration of card payments increased 38 percentage points between September 2017 and September 2018.[4] In the U.S., more than 75% of consumers say contactless payment methods are at least somewhat appealing, and about half are "extremely or very interested."[5]

The primary benefits of contactless payments are increased speed and convenience with the same level of security as EMV chip. All players in the payments ecosystem may see some benefit:

- Merchants may see faster throughput at the POS, enabling them to serve more consumers faster.
- Issuers may see increased spend as consumers opt for the issuer's contactless device rather than competing forms of payment.

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[1] EMV® is a registered trademark of EMVCo, LLC in the United States and other countries around the world.

[2] https://usa.visa.com/dam/VCOM/global/pay-with-visa/documents/vsa215-02-contactless.pdf.

[3] "At last, US banks are introducing contactless cards," Financial Times, Jan. 15, 2019, https://www.ft.com/content/445a308c-02f3-11e9-9d01-cd4d49afbbe3.

[4] https://s1.q4cdn.com/050606653/files/doc_financials/2018/q4/CORRECTED-TRANSCRIPT-Visa-Inc.(V-US)-Q4-2018-Earnings-Call-24-October-2018-500-PM-ET.pdf.

[5] Financial Times, op.cit.

- Consumers may be presented with a faster experience at the POS, saving them time.

Currently, the contactless POS experience is fragmented. Often, consumers are not aware that contactless payments are available. In other implementations, consumers attempt to use contactless payments at locations that have contactless signage, but the transaction is unsuccessful because the terminal does not actually support contactless payments. This white paper will describe best practices for implementing contactless at the POS to reduce stakeholder and consumer confusion and to help contactless deliver fully on its benefits to merchants, issuers, consumers, and the entire payments ecosystem.

2. Why Is the Consumer Experience at the Contactless POS Important?

Many factors shape the consumer shopping experience, from the store layout and location to store cleanliness and staff training. However, one of the most tangible ways that consumers interact with the merchant, and therefore one of the merchant's best opportunities to shape the consumer experience, is the checkout experience at the POS.

The introduction of EMV chip added friction to the consumer experience at the POS. Contactless payments evolved in countries implementing EMV to help solve this problem; they provide consumers with the speed and convenience of magnetic stripe while retaining the added security features of EMV chip. In many parts of the world, contactless payments are long established and mature. According to Visa, two in five Visa transactions outside of the U.S. are contactless today, with many countries in Europe and Asia exceeding three in four.[6]

As the U.S. prepares for contactless payments, merchants, issuers, terminal vendors, and other payment providers should be aware of the following consumer experience best practices:

- Consumers should know that they can tap through clear and consistent signage.
- The POS terminal should communicate when and where to tap during the transaction.
- Consumers should receive confirmation that their card was read and whether the transaction was approved or declined.
- Retail cashiers should be familiar with the experience for contactless payments to help consumers as they transact.

If all of these best practices are followed, merchants will be able to offer consumers a fast, easy, and secure checkout experience that delivers on consumer expectations of seamlessness and convenience and leaves consumers with a favorable impression of their shopping experience.

3. Consumer Experience Best Practices

3.1 How Does a Consumer Know Contactless Can Be Used?

Merchants can use several methods to communicate to consumers that they accept contactless payments.

[6] https://usa.visa.com/dam/VCOM/global/pay-with-visa/documents/vsa215-02-contactless.pdf.

1. A merchant best practice is to display the EMVCo Contactless Symbol (Figure 1) prominently on the terminal and/or during the checkout experience if contactless payments are accepted. The symbol should be displayed *before* the consumer begins the checkout experience, because consumers usually decide on their payment type before the payment process starts.
2. Merchants can also leverage the terminal display screen to communicate contactless acceptance by prompting consumers to "Tap/Insert/Swipe" during the checkout experience.

Figure 1. The EMVCo Contactless Symbol for Merchant Acceptance

Additionally, many merchants already display mobile wallet acceptance marks. While these marks do indicate that consumers can tap, consumers do not associate these symbols with the acceptance of contactless-enabled cards. The EMVCo symbol is inclusive of both cards and mobile wallets, and is recommended to be displayed as the baseline for contactless acceptance, regardless of other acceptance marks.

To ensure consumers are tapping at the proper location, terminal vendors and merchants should position the EMVCo Contactless Symbol with the optimal location on the terminal (i.e., the location that is best for reading the contactless device). The optimal point varies depending on terminal manufacturer and even models from the same manufacturer. Merchants should work with their terminal vendor or acquirer to determine the appropriate location for the EMVCo Contactless Symbol on their acceptance device.

Merchants that do not accept contactless transactions should not display the EMVCo Contactless Symbol since this would lead to significant consumer confusion. Note that some payment terminals are being sold to merchants with the EMVCo Contactless Symbol on the body of the terminal; in these cases, a merchant should cover the symbol if they do not accept contactless transactions to reduce consumer confusion.

3.2 When Should a Consumer Tap?

While integrations vary among merchants, two implementation methods are generally used that influence when consumers can tap for contactless payments: Traditional EMV and Faster EMV.[7] In both implementations, it is best practice that the terminal should prompt consumers to tap, and be ready to receive the tap at the same time when all other acceptance interfaces (swipe/insert) are also prompted and ready to be accepted.

[7] "Optimizing Transaction Speed at the POS," U.S. Payments Forum white paper, October 2017, http://www.uspaymentsforum.org/optimizing-transaction-speed-at-the-point-of-sale/. Both EMV and magnetic stripe contactless can support pre-tap and traditional transaction processes. EMV contactless is the recommended best practice; merchants should consult their requirements for new and existing implementations

- Traditional EMV requires the final total amount to be sent to the terminal before consumers can tap or insert.
- Faster EMV allows consumers to tap or insert before or in parallel to the tender being totaled. This is referred to as a pre-tap or pre-insert. Please note: the placeholder value used in pre-tap can impact the merchant choice of AIDs and CVMs.

Some terminals require cashier action before consumers are able to pay (i.e., the terminal needs to be in an active state). As implementations may vary, it is beneficial for the consumer experience and a best practice to have all payment interfaces (magnetic stripe, contact and contactless) enabled at the same time, rather than requiring a separate action to enable the contactless interface.

Certain scenarios may call for different methods. For example, in self-checkout implementations, a common practice is to allow a tap after the total is known, since the consumer is also executing the checkout process. In a scenario with pre-authorization, such as with petro, pre-tap should be used to initiate the order. Some self-service scenarios allow the customer to initiate the order with a tap. This is common when paying at a vending machine.

3.3 What Do Cashiers Need to Know?

Cashier training is crucial to a successful contactless implementation; training should be simple and easy. It is important that cashiers understand when, where and how to properly execute a contactless transaction based on the merchant's implementation in order to minimize consumer confusion and provide a seamless and convenient checkout experience. First, retail cashiers should be aware of the EMVCo Contactless Indicator (Figure 2). If this indicator appears on the front or back of a credit or debit card, the card is contactless-enabled and can be tapped to pay.

Figure 2. EMVCo Contactless Indicator for Card Enablement

When

Both cashiers and the payment terminal should be able to tell consumers when they are able to tap during a transaction. The timing of a consumer's tap depends on the contactless implementation (as described in Section 3.2).

Where

Cashiers should also be able to describe where consumers should tap on the terminal. The location should be clearly presented on the terminal. While the terminal should clearly indicate where to tap a device or card, the cashier will often need to help direct the consumer. As described in Section 3.1, the EMVCo Contactless Symbol should be placed to indicate the optimal read (antenna) location on the terminal. There are typically three places a consumer may tap:

- On the terminal: screen
- On the terminal: other location
- On a separate, contactless-specific device

How

Cashiers should receive training on how to execute contactless transactions with both cards and mobile wallets. Cashiers should also be aware of the Cardholder Verification Method (CVM) options, including the Consumer Device Cardholder Verification Method (CDCVM)[8] for mobile transactions.

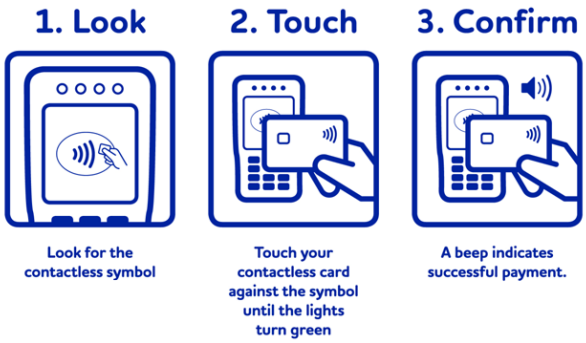

Figure 3. Contactless Payment Process for Enabled Cards

3.4 What Are Best Practices for the Consumer Transaction Flow?

The optimal consumer experience will vary across merchant implementations and market segments. For example, checkout at a grocery store looks very different from checkout at a quick-service restaurant. However, several contactless best practices apply regardless of the merchant or segment.

1. The consumer is alerted to the fact that the merchant accepts contactless by the presence of the EMVCo Contactless Symbol before the checkout process is initiated, as described in Section 3.1.
2. At the appropriate time in the checkout process, the terminal prompts the consumer to "Tap/Insert/Swipe," as described in Section 3.2.
3. The terminal display is designed, and cashier is trained, to help the consumer follow the prompts to complete the transaction.
4. The terminal indicates a payment confirmation when the tap has been accepted. Often this confirmation is a message on the screen, but it could also be audible (e.g., a "beep") or visual (e.g., a "green light").
5. The terminal communicates that the transaction is complete. When the authorization response is received, the approved or declined result is displayed.

3.5 Cardholder Verification Method (CVM)

This section summarizes the impact of the CVM on contactless transactions.

Contactless Transaction Limits. A contactless transaction limit is a terminal configuration setting above which a contactless transaction cannot be performed. Some payment networks provide merchants with the option to set these limits; merchants should check with their acquirers for additional information.

CVM Limit. A CVM limit must be set to determine when CVM processing is required to take place (signature or PIN); below the CVM limit, No CVM could be used or the CVM processing could be skipped (other than in mobile wallet implementations where CDCVM may occur before the mobile device is

[8] Also known as the On-Device Cardholder Verification Method (ODCVM).

tapped and regardless of whether the transaction is over or under the CVM limit). CVM limits are intended to simplify and speed low-value, low-risk transactions. In the U.S., CVMs are compatible with contactless, so a cardholder may tap and optionally sign or enter an online PIN if supported. Currently, if merchants choose to process the transaction with global AIDs, CDCVM may be performed by the customer.

If the transaction is above the CVM limit and there is no CVM supported by both the contactless card and the reader, the customer may be required to insert the card. To mitigate this, merchants are advised to ensure that signature is supported in each of the contactless kernels (where applicable), even if the merchant has opted out from requiring customers to sign.

CVM Processing for U.S. Debit Cards. In the U.S., merchants may choose to route debit transactions to the network of their choice. To implement this choice for contactless transactions, the U.S. Common Debit AID may be selected for processing.[9] If the U.S. Common Debit AID is chosen, the terminal may prompt for online PIN,[10] process as No CVM, or skip CVM processing, depending on the merchant's implementation and the transaction amount. For some, but not all, U.S. Common Debit AIDs, mobile transactions may process with the CDCVM, which may be a biometric. Merchants that have specific routing preferences or offer cashback may want to automatically prompt for online PIN if supported, even if CDCVM is performed. Merchants should consult with their acquirers regarding the availability of the CDCVM for the U.S. Common Debit AIDs they support and their requirements for enabling online PIN prompting (in addition to CDCVM).

4. Common Technical Challenges.

When implementing contactless payments, merchants may run into several common technical challenges. Typically, the challenges fall into two categories: technical interaction challenges and sources of customer confusion.

4.1 Terminal Interaction and Configuration Challenges

The most common issues involve either the consumer interaction with payment terminal, the mobile device/card interaction with payment terminal, read/interoperability conflicts at payment terminal, or some combination of these.

4.1.1 Challenges with Consumer Interaction with the Payment Terminal

This issue occurs when the consumer taps, the cashier waits for payment, and the consumer needs to tell the cashier that a tap was performed. This issue may be caused by the consumer tapping before the payment terminal is available to accept contactless payment, requiring the consumer to tap again later. When this situation occurs, the cashier may be able to perform a function on the POS system, and then ask consumer tap again.

See the U.S. Payments Forum publication, "U.S. Debit EMV Technical Proposal," available at http://www.uspaymentsforum.org/u-s-debit-emv-technical-proposal/, for additional details on implementation.

[10] Note that some issuers cannot support online PIN for tokenized transactions due to the lack of Track II discretionary data available for the real primary account number (PAN) after detokenization. This may impact issuer verification of the cardholder.

Options to prevent this issue include clearly communicating the preferred tap timing and programming the terminal to open all interfaces (i.e., swipe, insert, tap) at the same time.

4.1.2 Challenges with Mobile Device/Card Interaction with the Payment Terminal

Section 3.1 discussed the importance of placing the EMVCo Contactless Symbol at the optimal read point on the terminal to ensure that the contactless card or mobile device contactless transmission is read effectively. In addition, mobile devices may have the contactless transmitter in different locations. If these variations in the mobile transmitter cause read challenges, the current best practice is to attempt another contactless read at the read point on the terminal that is optimal for contactless.

4.1.3 Challenges with Read/Interoperability at the Payment Terminal

While the exception, merchants currently experience several types of read-method conflicts. The conflicts result from the various contactless-read methods supported by the terminal (i.e., magnetic stripe data (MSD) contactless and EMV contactless). These conflicts are expected to lessen as EMV contactless becomes more prevalent, and fewer terminals are using the magnetic stripe version of contactless. Examples of these technical conflicts include the following:

- Terminals may pick up the contactless signal while the card is being swiped due to the proximity of the magnetic stripe reader to the contactless antenna, and the consumer motion in moving the card over the terminal to get to the magnetic stripe reader. This issue is most common on smaller devices and mobile POS (mPOS) systems. This issue could also occur with a card insert but is less likely, since the card is farther from the contactless interface during an insertion and the consumer generally will hold their card farther away from the terminal as they insert.
- Terminals can sometimes pick up a contactless signal from an unlocked mobile device that is below the terminal on the counter. While the terminal may not process payment using the nearby mobile device, the persistent attempts by the terminal to capture the mobile device's contactless signal can cause interference and delay its ability to read a card. In this case, a terminal stand is recommended to increase the distance between the countertop and any nearby phone.
- If a merchant's POS terminal supports only MSD contactless, processing issues may arise with contactless transactions at the POS. While mobile wallets are generally backward compatible with MSD, cards and wearables may support only EMV contactless transactions. This incompatibility can result in a technology mismatch at the POS; the contactless antenna in the terminal detects a contactless card, but the POS application is unable to process the data from the chip. The result is that incorrect transaction data may be sent to issuers, leading to lower approval rates than for EMV contactless transactions. Most POS terminals manufactured over the last few years have included EMV-capable hardware, which includes support for contactless EMV.[11]

[11] "Contactless Payments: Proposed Implementation Recommendations," Secure Technology Alliance Payments Council white paper, Section 2.2.1, January 2018, https://www.securetechalliance.org/publications-contactless-payments-proposed-implementation-recommendations/.

4.2 Sources of Consumer Confusion

This section describes three sources of consumer confusion: placeholder amounts; implementation of loyalty with payment; and Magnetic Secure Transmission (MST).

4.2.1 Placeholder Amounts

When consumers tap to pay before the final amount, they may see a placeholder value on their phone, often $10 or $51. The amount may be confusing as it does not represent the consumer's total transaction amount. If the amount is going to be displayed, a best practice is to display the final amount from the issuer.

4.2.2 Loyalty and Payment

Adding loyalty functions in the contactless mobile wallet adds another level of complexity, with integration likely varying from merchant to merchant. Two implementations are generally used for loyalty using contactless – a single-tap method and a dual-tap method.

- In the single-tap method, loyalty and payment credentials are captured in the same tap. This approach generally requires pre-tap for loyalty.
- The dual-tap method generally leverages the first tap for loyalty and then captures a second tap for the payment credential. This might be used if loyalty on the first tap could change the final payment amount.

Both implementations are used in the U.S. market today. Consumer education is key to a successful experience which meets the intended goal of loyalty.

4.2.3 MST

MST is a technology that enabled mobile payment wherever magnetic stripe transactions were accepted, including at merchants who did not support contactless technology. As merchants enable contactless technology, MST users may be unaware of the change in how their device will function for payment, and may continue to hover their mobile devices over the magnetic stripe reader instead of tapping on the optimal contactless read point. Mobile devices in market today generally use the contactless read capability, where available, as the highest priority. The customer should tap where contactless is enabled, rather than hover the mobile device.

5. Mobile Device vs. Card Considerations

Mobile devices have been used to make contactless payments in the U.S. for several years, while contactless-capable card issuance and adoption have lagged. As contactless card issuance becomes more prevalent, merchants should be aware of important differences between the two form factors.

In general, NFC-enabled mobile devices transact in a very similar manner to contactless cards, with a few notable differences. First, the mobile device may require consumer authentication on the phone. Cashiers should be aware of this. In some cases, a PIN may still be required at the POS, even if the customer has performed device authentication. The second notable difference is that the mobile device may play a sound and provide a visual confirmation on the screen that the transaction was successful. Regardless of this mobile device feature, the POS acceptance device should also provide an audible and/or visual confirmation of a successful tap.

Another difference is the account information used for processing the payment transaction. NFC-enabled mobile payments are tokenized (i.e., the payment card number is replaced with a different

value). As a result, the merchant will not have the funding account number (including the last four digits of the card number) when processing the payment. Tokenization may impact loyalty functions, dispute processing, and debit routing. In addition, each device requesting a token for the same underlying card number will get a different token, further complicating the merchant's ability to provide services, like cross-channel returns, to consumers. Contactless cards, on the other hand, are not tokenized and allow access to the funding account number to be maintained as allowed by Payment Card Industry Data Security Standard (PCI DSS) rules.

6. Conclusions

Contactless is the preferred payment method in many parts of the globe. While nascent in the U.S., contactless payments are poised for mass adoption due to maturing acceptance, increasing availability, and growing consumer preference.

This white paper has described best practices for contactless implementation at the point of sale to ensure contactless payments maximize the increased speed and convenience they offer. Everyone in the payments chain should work to ensure that:

- Consumers know that they can tap through clear and consistent signage and use of the EMVCo Contactless Symbol.
- The POS terminal should communicate when and where to tap during the transaction through clear messaging and communication that directs the consumer to tap at the optimal read location.
- Consumers should receive confirmation that their card was read and whether the transaction was approved or declined.
- Retail cashiers should be familiar with the experience for contactless payments to help consumers as they transact.

If these practices are implemented properly, contactless will be more likely to deliver on its value proposition of making the checkout experience faster

7. Legal Notice

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