



November 2024

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# The Tokenization Innovation Report:

The Future of Security  
and Personalization



**PYMNTS**  
INTELLIGENCE



# The **Tokenization** Innovation Report:

The Future of Security  
and Personalization

## WHAT IS TOKENIZATION?

Tokenization is a process that safeguards sensitive payment information by replacing it with unique, non-sensitive identifiers known as tokens. These tokens securely map to the original payment credentials but are disguised in a way that even hackers would not be able to use them. This extra layer creates a much more secure and safe payment process and allows merchants to store payment information more securely.

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The Tokenization Innovation Report: The Future of Security and Personalization was produced in collaboration with Mastercard, and PYMNTS intelligence is grateful for the company's support and insight. [PYMNTS intelligence](#) retains full editorial control over the following findings, methodology and data analysis.

# WHAT'S AT STAKE

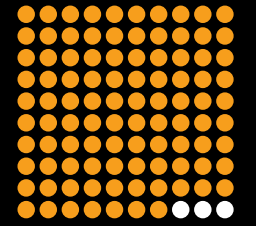
**T**hrough disguising and more safely storing payment information, tokenization has become a core part of payment operations for merchants and payment service providers (PSPs). Two types of tokens are currently available, network tokens and payment tokens, and they have one main difference. That difference is the point of origination: Credit card companies such as Mastercard or Visa create network tokens, whereas processors such as Stripe or PayPal create payment tokens.<sup>1</sup>

Seventy-eight percent of the small and mid-sized merchants we surveyed have enabled one of the two types of tokens, with near universal adoption among those with higher revenue. Virtually all PSPs support tokens as well.

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<sup>1</sup> For simplicity and ease of understanding, this report focuses on the difference between network tokens and payment tokens in a broad sense. Network tokens refer to all tokens issued by credit card networks, including scheme tokens, while payment tokens represent the broader category of tokens issued by third party processors, digital wallets, merchants or other providers.

# 97%



Share of merchants generating \$10 million to \$50 million in annual revenue that enable network or payment tokens

PYMNTS Intelligence's latest study finds that network tokens, in particular, are poised for further growth and to create more secure transactions and better customer experiences. Seventy-seven percent of merchants not currently offering network tokens plan to roll them out, and 92% of PSPs that already enable network tokens plan to invest in further capabilities. Key areas merchants and PSPs want to upgrade include digital wallet card payments, card-on-file payments and recurring payments.



While enthusiasm for network tokens runs high, merchants and PSPs express concerns about service fees and costs. These concerns indicate that providers of network tokenization solutions should work on ensuring merchants and PSPs implement and manage network tokens in a cost-effective way, as well as understand and take advantage of the entire value proposition tokenization provides.

These are just some of the findings detailed in **The Tokenization Innovation Report: The Future of Security and Personalization**, a PYMNTS Intelligence and Mastercard collaboration. This edition examines network token use by merchants and PSPs and draws on insights from a survey of 110 merchants and 100 PSPs conducted from Aug. 5 to Sept. 4.

**This is what we learned.**

**95%** 

Share of PSPs enabling network tokens that want to upgrade their card-on-file capabilities

**“ Network tokens seem to have a bright future ahead of them, since their uses are expected to go beyond payments to include more extensive applications. ”**

– PSP respondent

**“ With their increased security and efficiency, network tokens are poised to revolutionize a number of industries. ”**

– Merchant respondent

**“ [Network tokens] help everyone involved, from purchaser to merchant, be a lot safer with more accurate sales. ”**

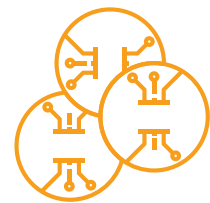
– PSP respondent

# KEY FINDINGS

## 01

### TOKEN AVAILABILITY

Most merchants already enable payment or network tokens, and adoption is even more widespread among higher-revenue companies.



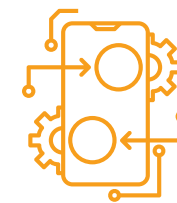
**78%**

Share of merchants that currently enable network or payment tokens

## 02

### DIGITAL WALLETS

Merchants are most likely to use network tokens to enable card payments via digital wallets, with card-on-file payments second-most popular.



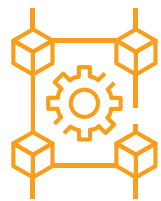
**87%**

Share of merchants that use network tokens to enable card payments via digital wallets, among merchants already enabling network tokens

# 03

## CUSTOMER EXPERIENCE

Merchants and PSPs report enabling network tokens has myriad benefits, including a better customer experience and an improved ability to store information.



# 28%

Share of merchants citing better customer experiences as the biggest advantage of enabling network tokens, among merchants already enabling network tokens

# 04

## INCREASING USE

Most merchants and nearly all PSPs plan to use more network tokens — and soon.



# 72%

Share of merchants that plan to increase their use of network tokens in the future, including those that plan to start enabling them

# THE FULL STORY

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**Merchants and PSPs are ramping up support for network tokens, citing improved customer experiences, smoother transactions and improved compliance, among other advantages.**

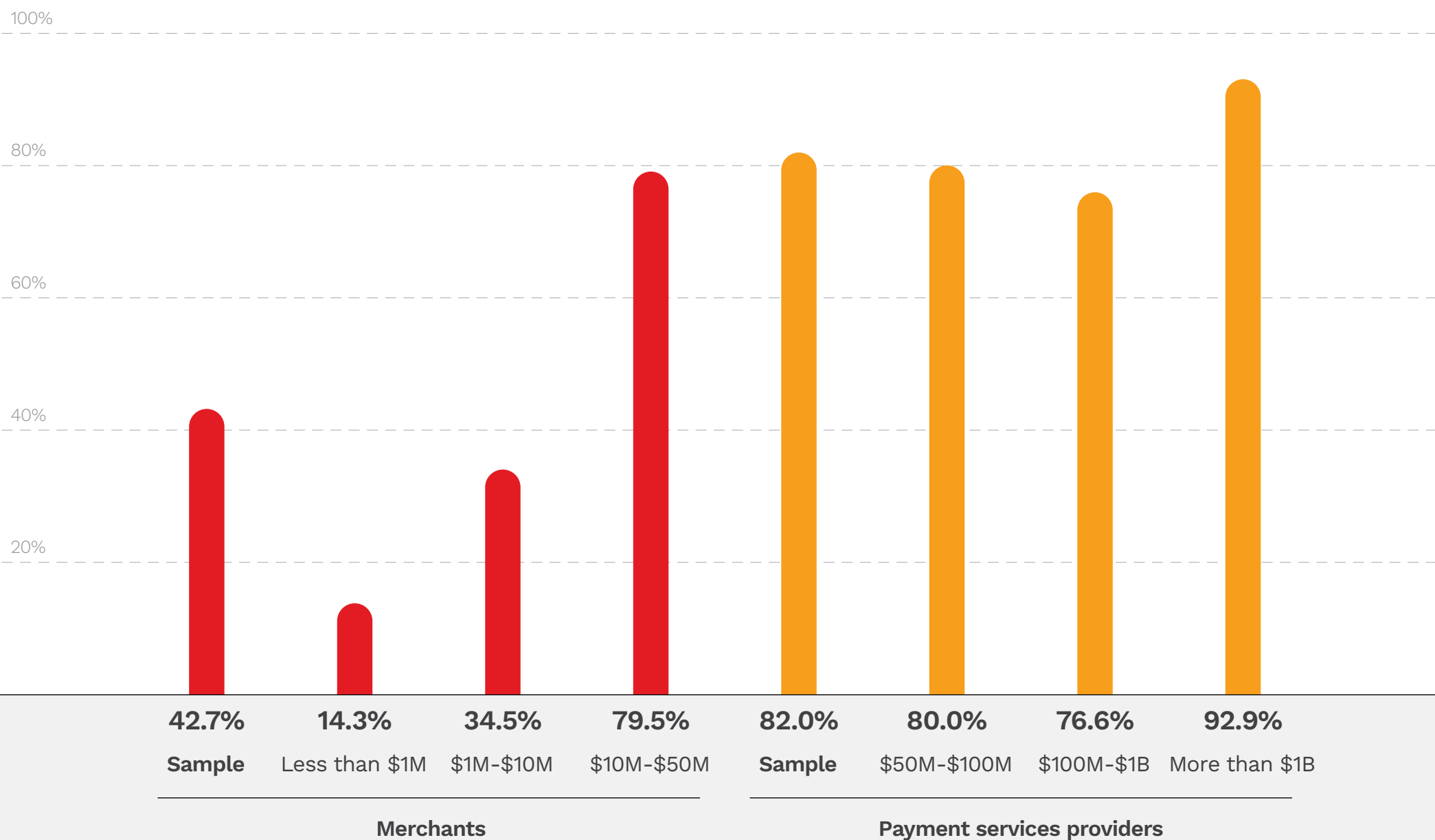
## **Most merchants support payment or network tokens, and adoption increases significantly with higher revenue levels.**

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Larger merchants are more familiar with tokenization. Eighty percent of merchants generating \$10 million to \$50 million in annual revenue are very or extremely familiar with payment data tokenization solutions, far more than the corresponding 35% of those generating \$1 million to \$5 million and 14% of those generating less than \$1 million in annual revenue.

Among PSPs, familiarity is much higher overall, at 82% across the sample and 93% for PSPs generating more than \$1 billion in revenue. That said, it is surprising that roughly 1 in 5 PSPs in the \$50 million to \$1 billion revenue bracket did not indicate high levels of familiarity, considering they specialize in payment solutions. This suggests many smaller PSPs may have a strong interest in third-party tokenization solutions.

**FIGURE 1:**  
**Familiarity with payment data tokenization solutions**  
 Share of merchants and PSPs very or extremely familiar with payment data tokenization solutions, by annual revenue



Source: PYMNTS Intelligence  
 The Tokenization Innovation Report: The Future of Security and Personalization, November 2024  
 N = 110: Merchants, N = 100: PSPs, fielded Aug. 5, 2024 – Sept. 4, 2024

## NETWORK TOKENS VERSUS PAYMENT TOKENS

Major credit card networks, including American Express, Discover, Mastercard and Visa, create network tokens. Network tokens replace sensitive payment account data with distinct, temporary account numbers and encrypt payment information with unique transaction codes for each purchase. This enables secure, card-not-present transactions and provides high levels of interoperability across merchants.

PSPs, processors or token service providers such as TokenEx typically create payment tokens. Like network tokens, payment tokens encrypt payment information with a unique identifier to ensure a more secure transaction between the merchant and payment facilitator.



# 92%




Share of merchants highly familiar with data tokenization that enable tokens

Most merchants already enable tokens, even though they may not necessarily be highly familiar with existing tokenization solutions. Enablement rates climb among higher revenue brackets, from 60% for merchants generating less than \$1 million in annual revenue to 97% among those in the \$10 million to \$50 million bracket. Greater familiarity also tracks with higher rates. However, the data reveals a relatively fractured token landscape on the merchant side: 33% of merchants enable both network and payment tokens, while 17% enable only payment tokens and 28% enable only network tokens. Even among the merchants that are highly familiar with tokenization, the same general trend is apparent, pointing to an opportunity for either network or payment tokenization solutions providers to consolidate market share.

**FIGURE 2:**

**Merchant enablement of network and payment tokens**

Share of merchants that enable network and payment tokens, by revenue and familiarity with payment data tokenization solutions

	Enable both network and payment tokens	Enable only payment tokens	Enable only network tokens	TOTAL
Sample	32.7%	17.3%	28.2%	78.2%
<b>REVENUE</b>				
Less than \$1M	26.2%	16.7%	16.7%	59.5%
\$1M-\$5M	34.5%	6.9%	37.9%	79.3%
\$10M-\$50M	38.5%	25.6%	33.3%	97.4%
<b>DATA TOKENIZATION FAMILIARITY</b>				
Very or extremely familiar	34.0%	23.4%	34.0%	91.5%
Somewhat familiar	35.0%	20.0%	30.0%	85.0%
Slightly or not at all familiar	30.2%	9.3%	20.9%	60.5%

Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 110: Merchants, fielded Aug. 5, 2024 – Sept. 4, 2024

Turning to PSPs, enablement rates are more than 90% regardless of revenue band. However, the data reveals a huge gap seemingly linked to familiarity level. Ninety-nine percent of PSPs that are highly familiar with payment data tokenization solutions enable either network or payment tokens, while 78% of those with lower levels of familiarity do so. Considering the space PSPs operate in, it is notable that just three-quarters enable both network and payment solutions. This indicates that PSPs typically, but not universally, find it important to offer both types of solutions.


**95%** 

Share of PSPs that enable tokens

**FIGURE 3:**

**PSP token enablement**

Share of PSPs that enable network or payment tokens

	Enable both network and payment tokens	Enable only payment tokens	Enable only network tokens	TOTAL
Sample	<b>75.0%</b>	<b>7.0%</b>	<b>13.0%</b>	<b>95.0%</b>
<b>REVENUE</b>				
\$50M-\$100M	<b>72.0%</b>	<b>8.0%</b>	<b>12.0%</b>	<b>92.0%</b>
\$100M-\$1B	<b>74.5%</b>	<b>6.4%</b>	<b>17.0%</b>	<b>97.9%</b>
More than \$1B	<b>78.6%</b>	<b>7.1%</b>	<b>7.1%</b>	<b>92.9%</b>
<b>DATA TOKENIZATION FAMILIARITY</b>				
Very or extremely familiar	<b>80.5%</b>	<b>7.3%</b>	<b>11.0%</b>	<b>98.8%</b>
Somewhat familiar	<b>50.0%</b>	<b>5.6%</b>	<b>22.2%</b>	<b>77.8%</b>
Slightly or not at all familiar	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Source: PYMNTS Intelligence  
 The Tokenization Innovation Report: The Future of Security and Personalization, November 2024  
 N = 100: PSPs, fielded Aug. 5, 2024 – Sept. 4, 2024

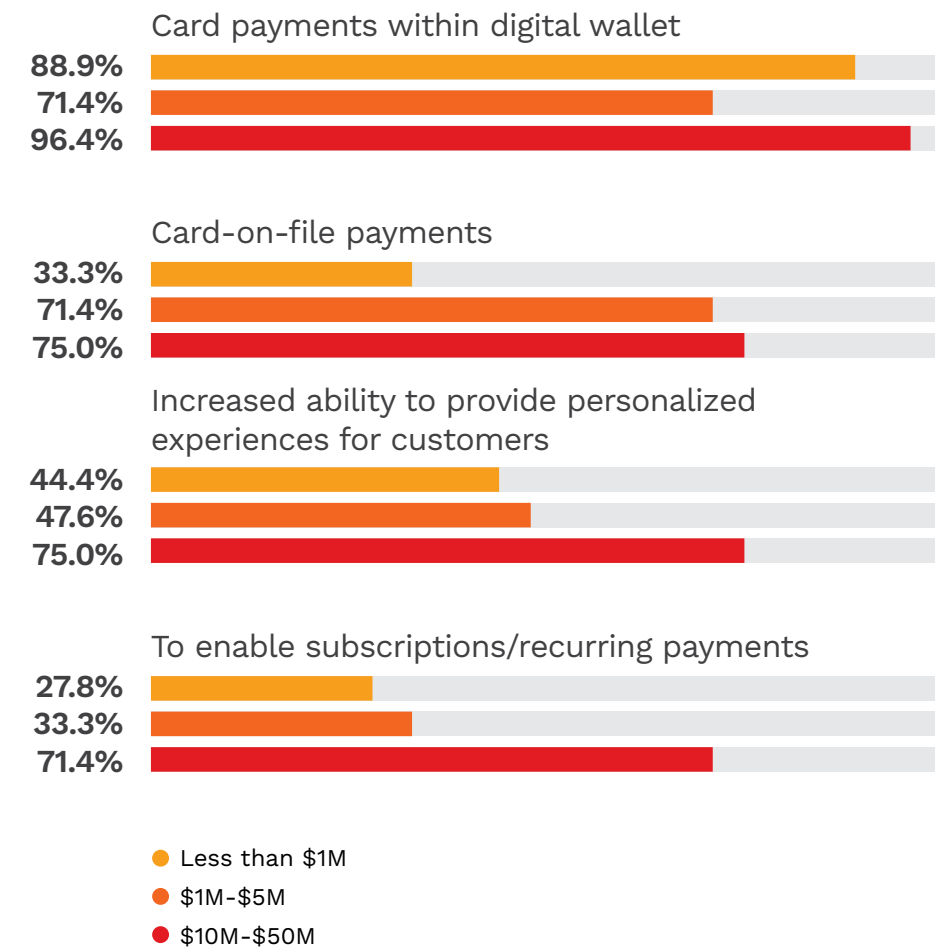
## Merchants are most likely to use network tokens for digital wallet transactions, with Visa and Mastercard the most popular networks for merchants and PSPs.

Network tokens unlock a variety of core payment applications for merchants and PSPs. Among merchants that use network tokens, 87% use them to enable card payments within digital wallets. Card-on-file payments, which can leverage stored customer payment information in a way that does not expose the underlying credentials when tokenized, are next most popular, at 63%. Facilitating personalized experiences for customers (58%) and enabling subscriptions and recurring payments (48%) are also common applications for many merchants. Merchants with higher revenues are much more likely to use network tokens for these purposes, echoing the previously discussed finding that larger merchants have greater familiarity with tokenization.

**FIGURE 4:**

### How merchants use network tokens

Share of merchants that enable network tokens, by use case and revenue level



Source: PYMNTS Intelligence

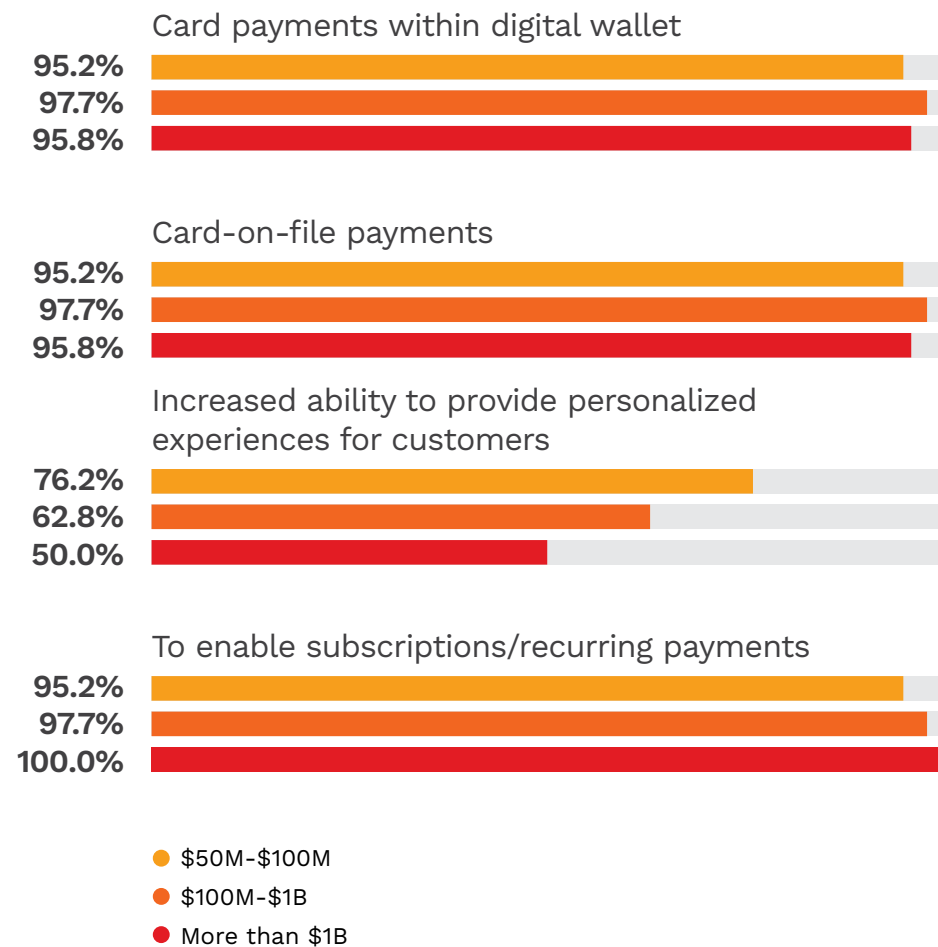
The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 67: Merchants that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

**FIGURE 5:**

**How PSPs use network tokens**

Share of PSPs that enable network tokens, by use case and revenue level

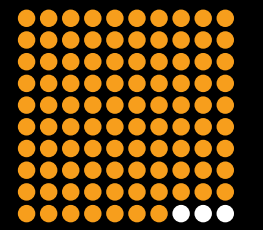


Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 88: PSPs that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

**97%**



Share of PSPs that use network tokens to provide digital wallet payments

Nearly all the PSPs that use network tokens do so to enable multiple payment technologies. Ninety-eight percent use network tokens to provide subscription or recurring payment solutions, while 97% leverage network tokens to unlock digital wallet card payments and card-on-file payments. Interestingly, far lower shares of PSPs (63%) use network tokens to provide personalized experiences for customers. This suggests PSPs may be missing an opportunity to provide more holistic tokenization solutions to the merchants and other end users they serve.

Merchants that enable network tokens are most likely to support the Visa and Mastercard networks, and 93% and 90% do so, respectively. Nearly two-thirds support American Express (63%), and Discover ranks fourth, at 54%. Among PSPs, Visa and Mastercard also lead, supported by 98% and 100% of PSPs, respectively, with American Express more closely behind at 93%.

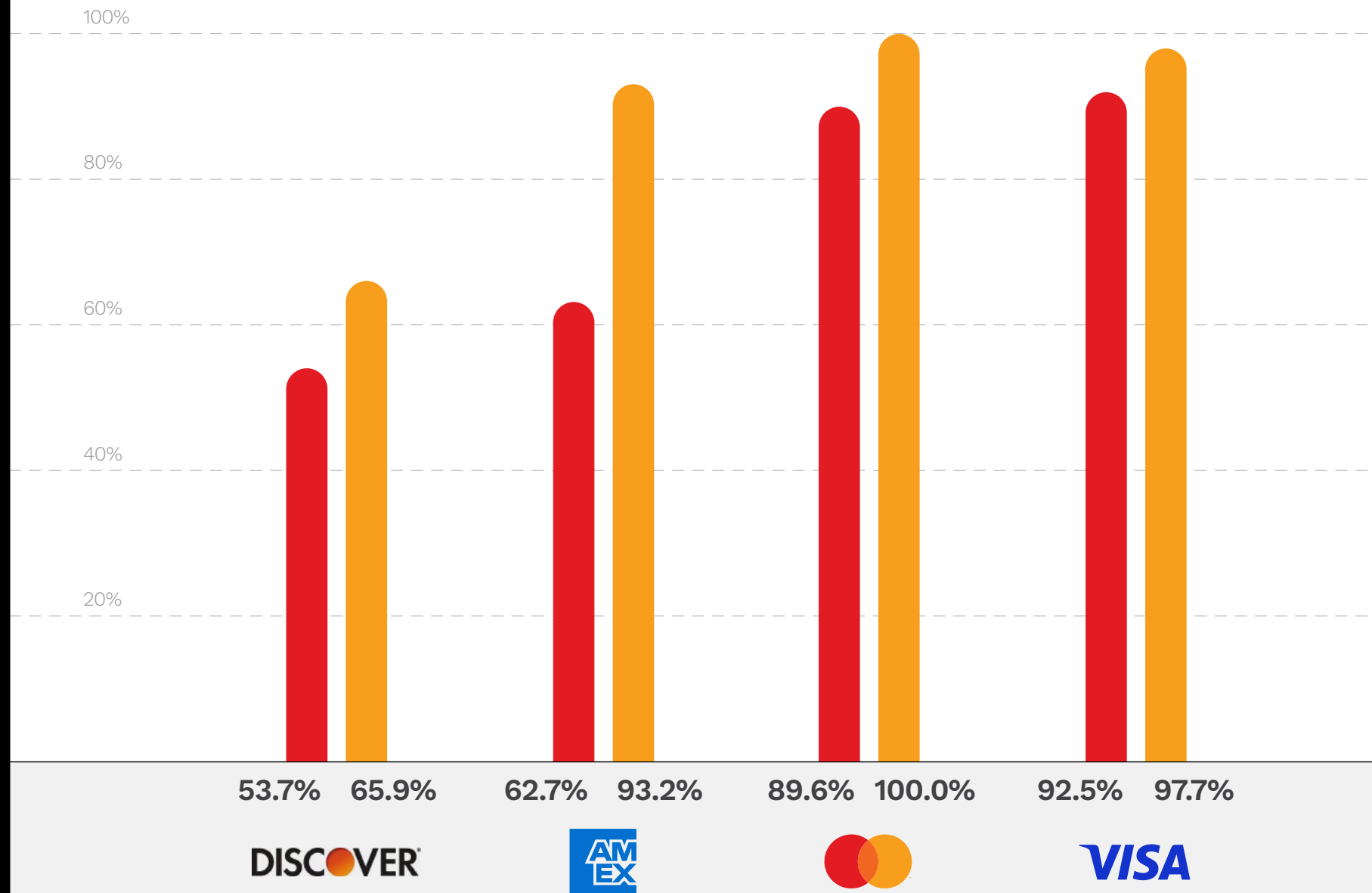
**More than 90%**  
of PSPs that enable network tokens support the Mastercard, American Express or Visa networks.

**FIGURE 6:**

**Networks of choice**

Share of merchants and PSPs that enable select network tokens

- Merchants
- Payment services providers



Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 67: Merchants that enable network tokens, N = 88: PSPs that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

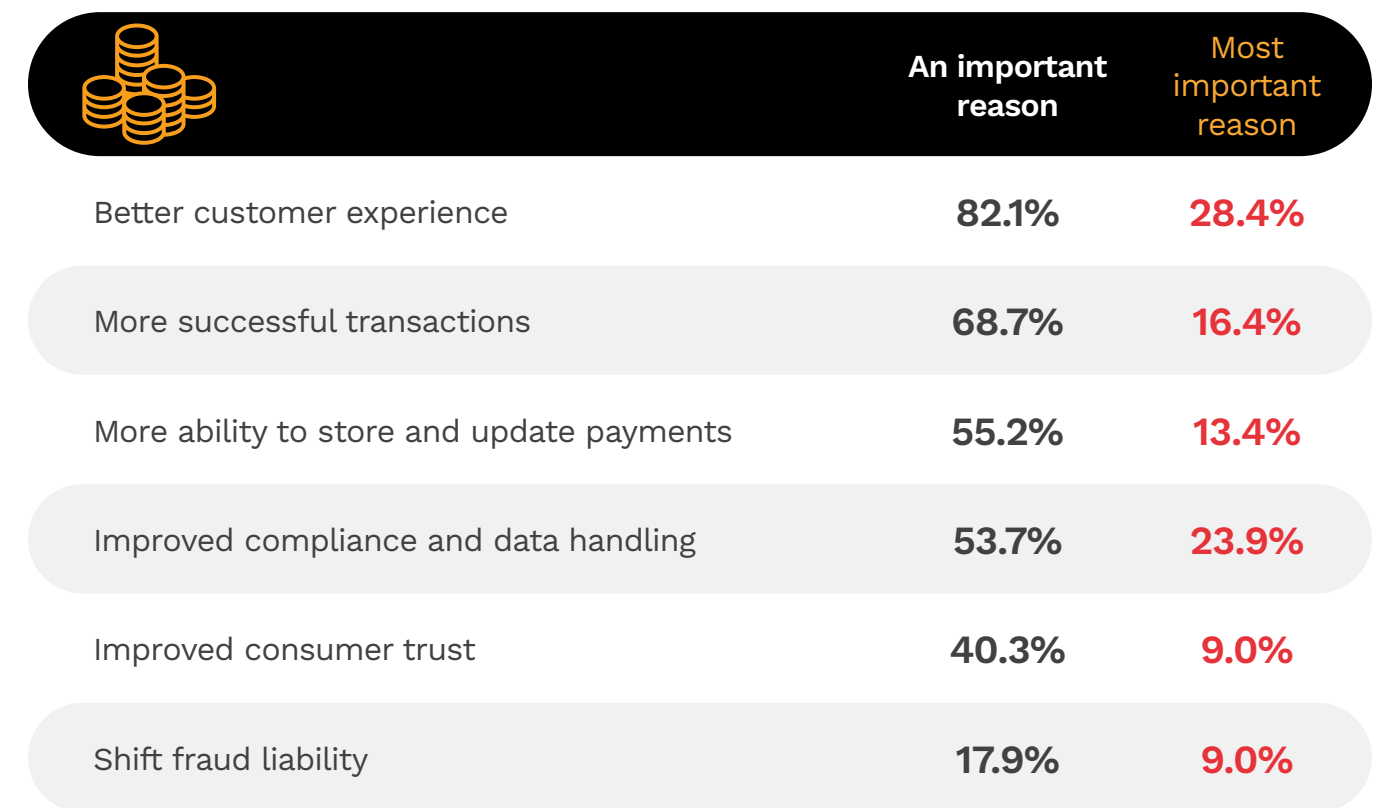
## Merchants and PSPs report many benefits from enabling network tokens, such as better customer experience, more successful transactions and better ability to store information.

Network tokens appeal to merchants for a variety of reasons. Data shows that 28% of merchants that enable network tokens name a better customer experience as the biggest advantage of enabling network tokens, and 82% identify this as an important reason to enable the tokens. This suggests merchants widely view network tokens as delivering visible benefits from the customer’s perspective. Other leading reasons include improved compliance and data handling, named by 24% as the top motivation for enabling network tokens, more successful transactions, named by 16%, and better ability to store and update payments, also named by 16%.

FIGURE 7:

### Merchants’ reasons for enabling network tokens

Share of merchants citing select reasons for enabling network tokens, by level of importance



Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 67: Merchants that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

# 71%



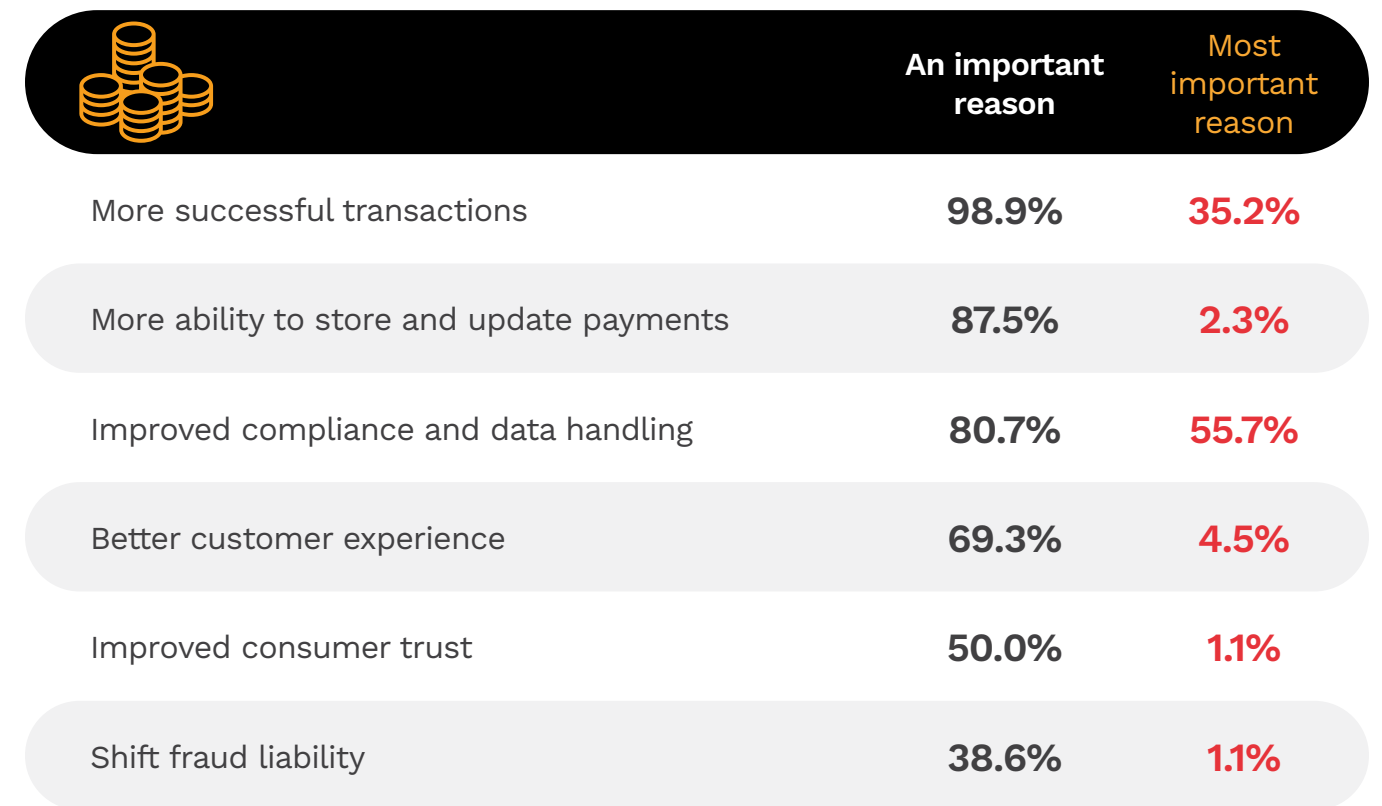
Share of PSPs that named a better customer experience as an important reason for enabling tokens

Meanwhile, 9 in 10 PSPs that enable network tokens name one of two reasons as their top benefit. Fifty-five percent say improved compliance and data handling is the most important driver for enabling network tokens, and 35% identify more successful transactions as the biggest advantage. Notably, 99% named the latter as one of the key reasons for using network tokens, underscoring the fact that smoother transactions can play a central role in the value proposition from PSPs' perspective.

**FIGURE 8:**

**PSPs' reasons for enabling network tokens**

Share of PSPs citing select reasons for enabling network tokens, by level of importance



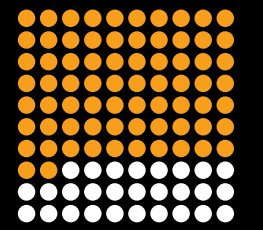
Source: PYMNTS Intelligence  
 The Tokenization Innovation Report: The Future of Security and Personalization, November 2024  
 N = 88: PSPs that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

## Most merchants and nearly all PSPs plan to ramp up their use of network tokens in the near future.

Looking to the future, the study shows that the enablement of network tokens will rise substantially across merchants and PSPs. Overall, 72% of merchants said they plan to increase their use of network tokens in the future. Enthusiasm is highest for merchants generating \$10 million to \$50 million in annual revenue, at 87%, versus 55% among those generating less than \$1 million in revenue. Notably, we see especially strong interest from merchants that do not currently use network tokens, with 77% expecting to roll out network token support. This indicates a broad shift toward network tokenization solutions is underway for small and mid-sized merchants.

On the PSP side, the data reveals that 9 in 10 plan to ramp up their use of network tokens, with minimal variation across income brackets. However, we note a relative lack of interest among the minority of PSPs that have not already adopted network tokens, with only 67% of this group expecting to launch network token support.

# 72%



Share of merchants that plan to increase their use of network tokens in the future

Most merchants and PSPs that already support network tokens plan to boost their capabilities sooner rather than later. Sixty-five percent of merchants said they plan to enhance their use of network tokens in the next year, and an additional 20% indicated they plan to do so in the next two to three years. For PSPs, 71% plan to improve their network token support in the next year, and 18% in the next two to three years.



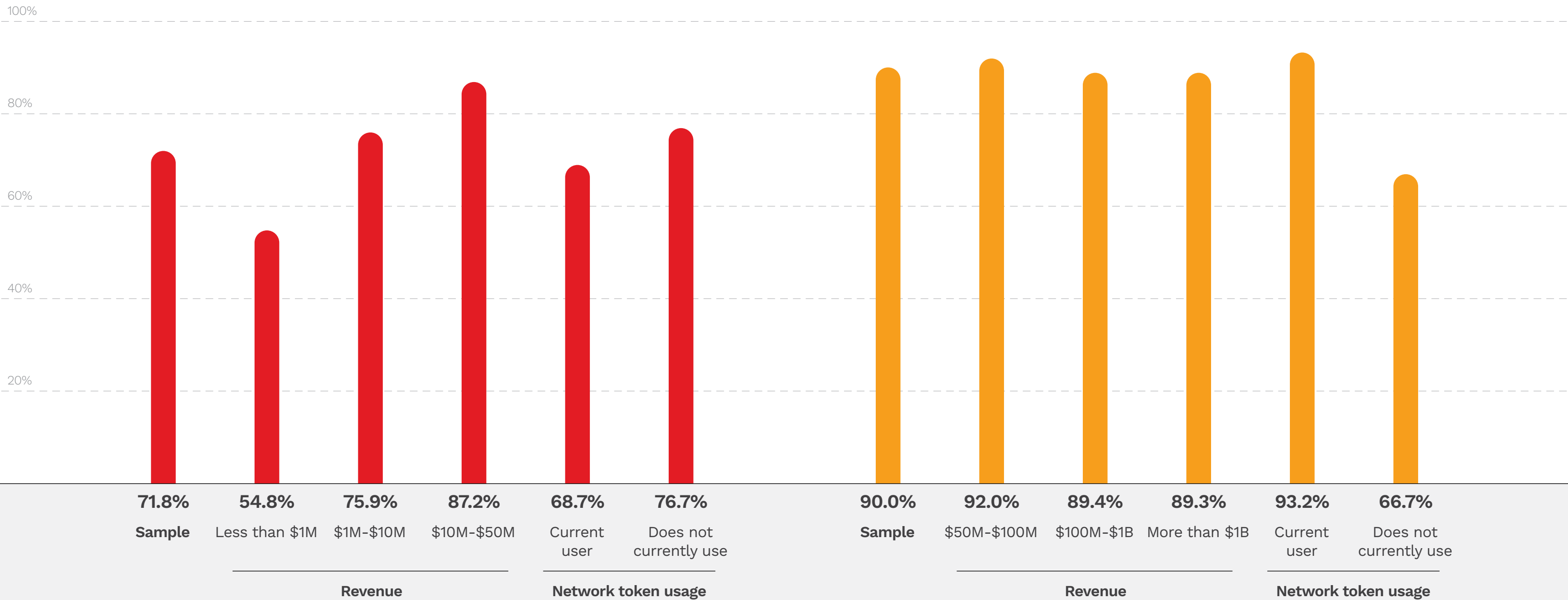


**FIGURE 9:**

**Network tokens' future outlook**

Share of merchants and PSPs that plan to somewhat or significantly increase their use of network tokens in the future, by revenue and current use status

- Merchants
- Payment services providers



Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 110: Merchants, N = 100: PSPs, fielded Aug. 5, 2024 – Sept. 4, 2024

Merchants and PSPs are focused on improving their network token use in several key areas. These include card-on-file payments, card payments via digital wallets, subscription or recurring payments, and personalized experiences. Among merchants already offering network token support, digital wallet card payments top the list, cited by 82% as an area where they would like to boost capabilities. Seventy-nine percent and 58% of these merchants, respectively, want to focus on subscriptions and personalization. The share of merchants that want to improve their subscription or recurring payment features using tokens comes in much lower, at 35%, indicating that tokenization solutions providers may not be offering what merchants want in this area — or that they are not aware of these capabilities.

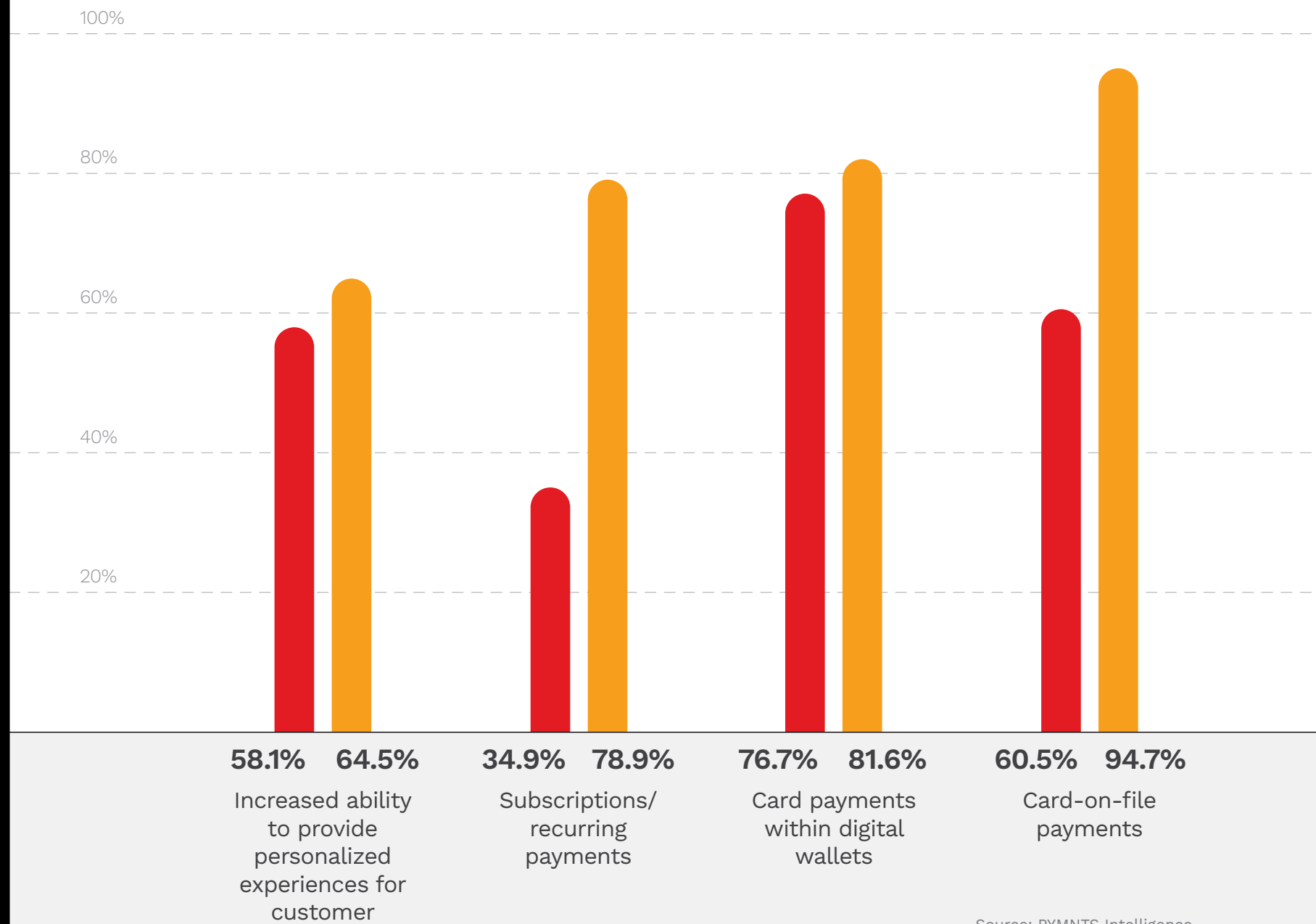
For PSPs, even higher shares of respondents that already support network tokens want to enhance offerings in these four areas. Card-on-file payments lead at 95%, while the other three features come in between 65% and 82%.

**FIGURE 10:**

**Use cases for network token improvement**

Share of PSPs and merchants citing the network token use cases they want to enhance or improve

- Merchants
- Payment services providers



Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 67: Merchants that enable network tokens, N = 88: PSPs that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

## PSPs and merchants see the fees and costs associated with network tokens as the main drawbacks.

Network tokens offer many advantages, but businesses also have some concerns about enabling them. For merchants that currently enable network tokens, service fees rank as the primary drawback. Fifty-two percent of merchants named this as one of the downsides, and 31% said service fees were the biggest issue. The costs required to integrate and manage network systems follows, at 37%, with 13% naming those costs a top concern. These findings indicate that network tokenization providers need to ensure merchants implement the right solutions for their specific use cases in a cost-effective way. In addition, providers must ensure merchants understand the overall value proposition, which includes outsourcing a considerable amount of effort, management and risk — and all the associated costs — to the network providers.

FIGURE 11:

### Top concerns for merchants and PSPs

Share of merchants and PSPs enabling network tokens that cite select concerns in doing so, by level of importance

Merchants	Most important reason	Important, but not the most	TOTAL
The service fees associated with using network tokens	31.3%	20.9%	52.2%
Internal costs to integrate and manage network token systems	13.4%	23.9%	37.3%
Effort required to manage the token vault	4.5%	32.8%	37.3%
Uncomfortable with a third party handling data security	11.9%	16.4%	28.4%
Less control over how tokens are managed	3.0%	25.4%	28.4%

Payment services providers	Most important reason	Important, but not the most	TOTAL
Internal costs to integrate and manage network token systems	46.6%	40.9%	87.5%
The service fees associated with using network tokens	23.9%	59.1%	83.0%
Technical integration issues related to using network tokens	8.0%	75.0%	83.0%
Effort required to manage the token vault	2.3%	65.9%	68.2%
Less control over how tokens are managed	4.5%	51.1%	55.7%

Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

N = 67: Merchants that enable network tokens, N = 88: PSPs that support network tokens: PSPs, fielded Aug. 5, 2024 – Sept. 4, 2024

Turning to PSPs, the story is much the same, except that implementation and management costs rank as the top concern. Eighty-eight percent of PSPs that currently enable network tokens named this as an issue they face, and 47% identified it as the biggest drawback. Service fees follow, cited by 83% of PSPs, including 24% that ranked this as their number one concern. Other key issues for merchants and PSPs include technical integration challenges, the effort required to manage the token vault and less control over how tokens are managed.

**88%** 

of PSPs named implementation and management costs as their biggest concern related to enabling tokens

**“ [Network tokens] can improve security both online and in-store, expedite payments and improve areas like retail in the near future. ”**

– PSP respondent

**“ [Network tokens] will expand, since there will be [better] identity verification and customers’ trust will be there. ”**

– Merchant respondent

The fact that so many merchants and PSPs cited these three concerns further underscores the need for network tokenization providers to ensure businesses using their solutions make cost-effective decisions and understand what the networks provide. For example, proper implementation of network tokens should reduce, rather than increase, the effort it takes to manage the token vault.

# DATA FOCUS

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**Data breaches drive interest  
in network tokenization solutions.**

**Merchants that experienced incidents with online transactions are three times more likely to have plans to enhance how they use network tokens in the future.**

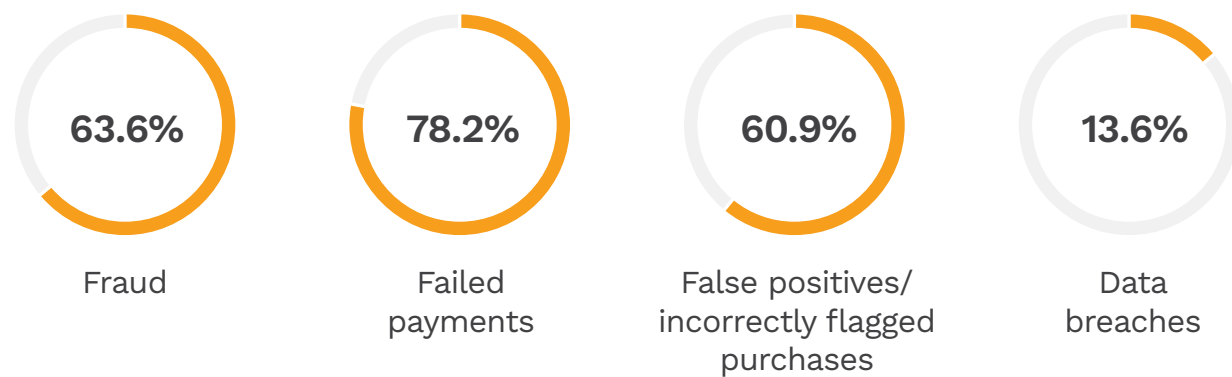
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Merchants widely face payments-related incidents that can cause them to lose sales and put their customers at risk. In the past year, 79% of merchants experienced at least one of three problems — fraud, failed payments or false positives — and most experienced multiple categories of incidents. Nearly two-thirds of merchants reported fraud alone, highlighting the widespread reality of severe challenges related to payment security. Moreover, 14% of merchants experienced a data breach that compromised customer payment credentials — a nightmare for any online business.

**FIGURE 12:**

**Merchants widely report payments-related incidents**

Share of merchants that experienced select incidents in at least some share of their online transactions in the last 12 months or data breaches in the last three years



Source: PYMNTS Intelligence

The Tokenization Innovation Report: The Future of Security and Personalization, November 2024

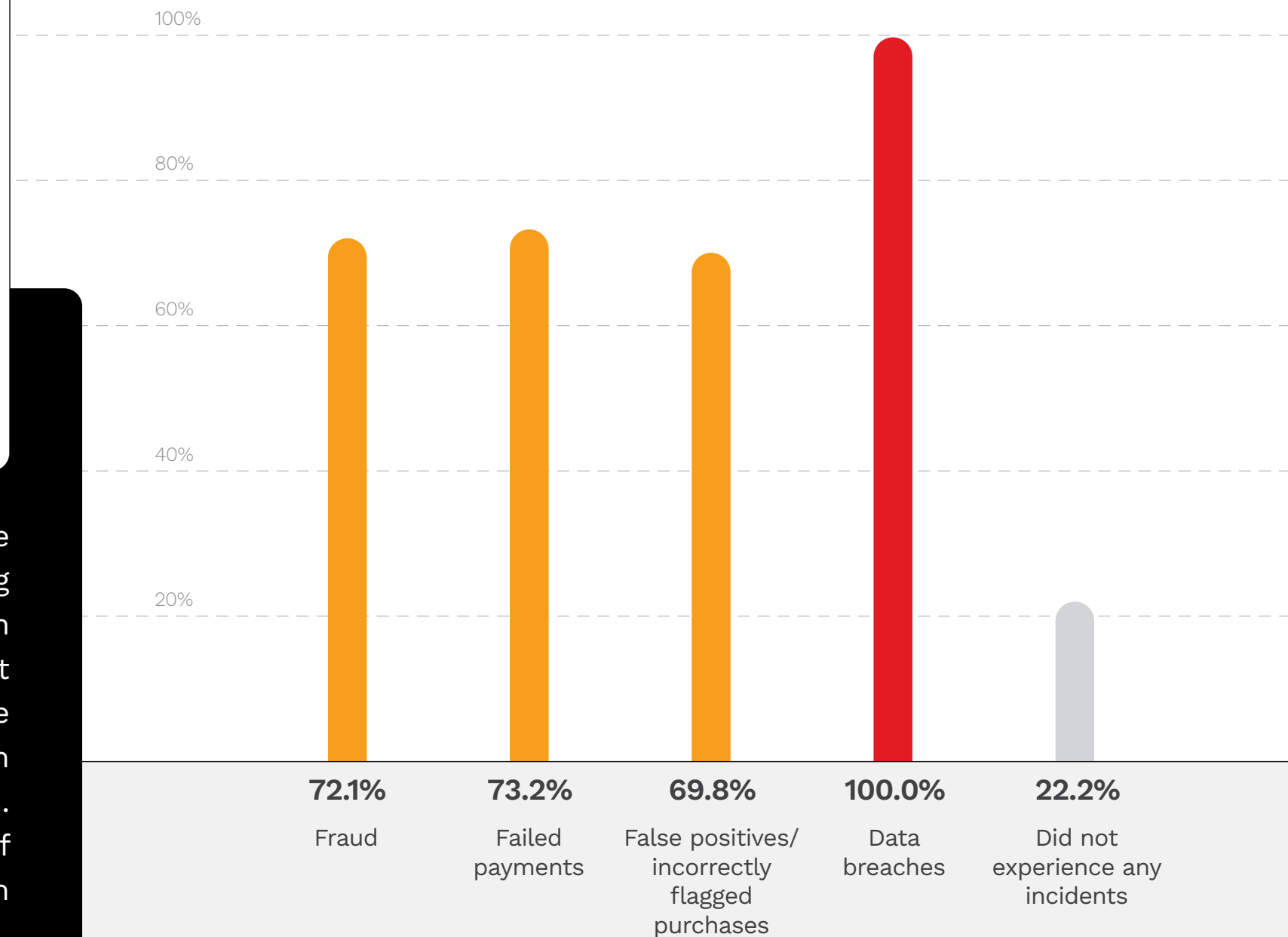
N = 110: Merchants, N = 100: PSPs, fielded Aug. 5, 2024 – Sept. 4, 2024

We found that merchants experiencing these incidents are far more likely to plan upgrades for their network token capabilities. Among those respondents that already support network tokens, roughly 7 in 10 that suffered fraud, failed payments or false positives in the last year have plans to enhance their use of network tokens. Even more dramatically, 100% of merchants that experienced data breaches in the last three years plan to improve their network token capabilities. Meanwhile, just 22% of merchants that did not experience any of these four types of incidents plan to augment their network token capabilities.

**FIGURE 13:**

**Plans to enhance network token capabilities**

Share of merchants highly likely to enhance use of network tokens in the future, by whether they experienced incidents in online transactions



Source: PYMNTS Intelligence

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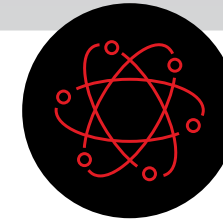
N = 67: Merchants that enable network tokens, fielded Aug. 5, 2024 – Sept. 4, 2024

# ACTIONABLE INSIGHTS



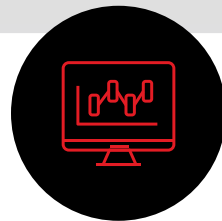
01

As merchants become bigger, their familiarity with tokenization and the likelihood they enable payment or network tokens grows. The landscape is relatively fragmented, however, and there is room for consolidation by the major token networks. Merchants with lower revenues have the most room to grow token enablement. Though token enablement is nearly universal among PSPs, a sizable share of PSPs support only payment or network tokens, but not both.



03

Network tokens provide numerous benefits merchants and PSPs recognize. These include better customer experiences, more successful transactions and improved ability to store payment and customer information. Most merchants and nearly all PSPs have plans to boost their network token capabilities or launch network token support. Those that do not look to improve may well be left behind.



02

Merchants and PSPs both use network tokens for a range of purposes. For merchants, card payments via digital wallets represent the most common application, while PSPs nearly all cite at least three key use cases. That said, the data shows a gap in the use of tokens to provide personalized experiences for customers, meaning both merchants and PSPs for token solutions providers can target personalization to deliver further value added beyond core payments enablement.



04

Merchants and PSPs perceive several key drawbacks from supporting network tokens, chief among them service fees and internal costs. The frequency with which respondents cited these two concerns, along with a few others, indicate that network tokenization providers should invest greater effort in ensuring merchants and PSPs understand the total value proposition of network tokens and how to implement the right solutions in the most cost-effective way.





November 2024

# The Tokenization Innovation Report:

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## METHODOLOGY

**T**he Tokenization Innovation Report: The Future of Security and Personalization is based on a survey of 110 merchants and 100 PSPs conducted from Aug. 5 to Sept. 4. The report examines network token use by both merchants and PSPs. Our sample included merchants generating annual revenues up to \$50 million and PSPs generating annual revenues between \$50 million and \$1 billion. Merchants represented a wide variety of industries, including retail, electronics and home furnishings.

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# ABOUT

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