

---

# WEB PAYMENTS

---

Ian Jacobs, Dec 2020

---

---

---

# IAN JACOBS

**W3C Payments Lead**

**[<ij@w3.org>](mailto:ij@w3.org)**



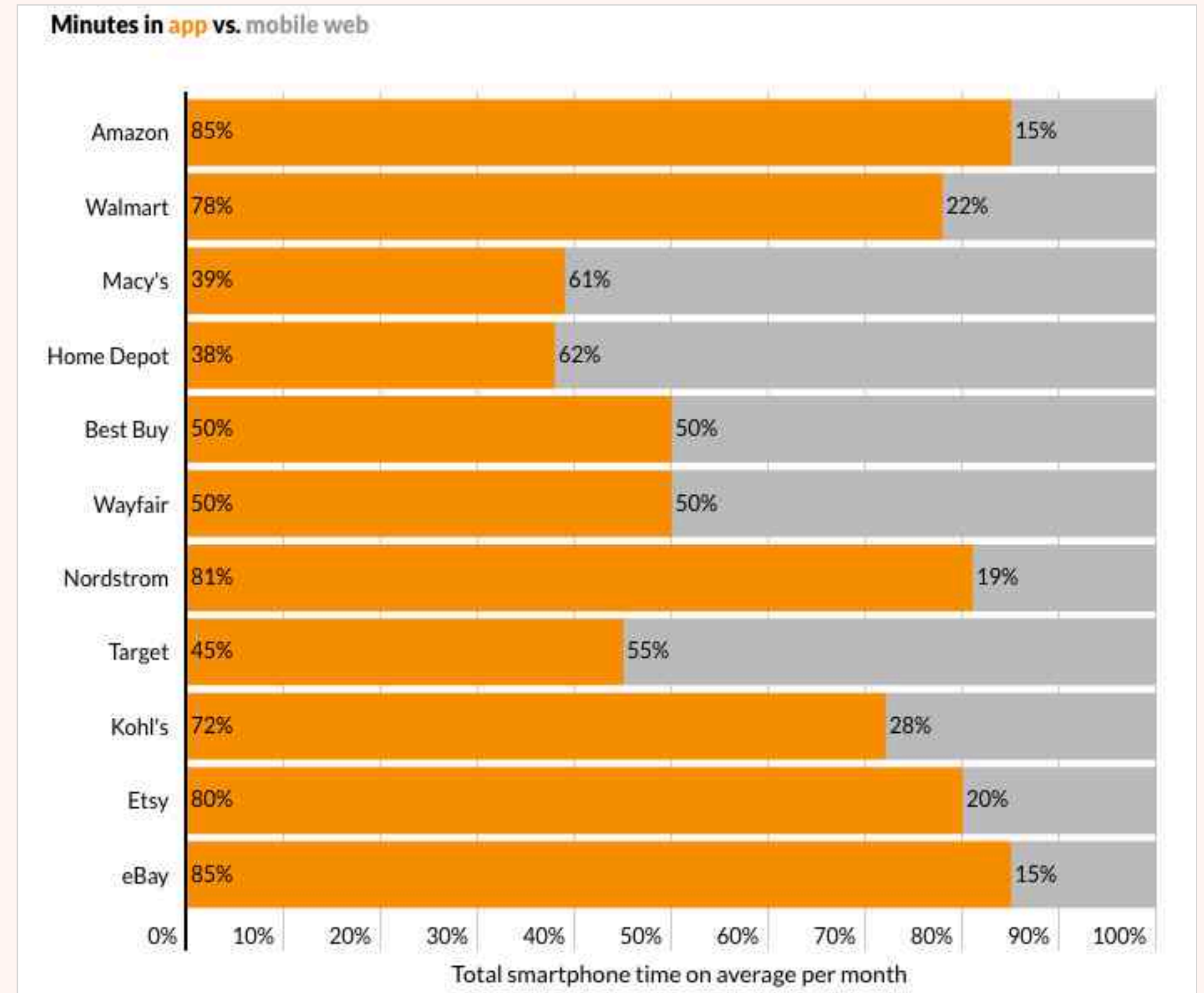
# HOW DO YOU REACH CUSTOMERS?

- **W3C focus is competitive Web platform**
- **My focus is streamlining Web-based checkout experiences**
- **This presentation draws on data from US and EU markets (rather than to Asia markets)**
- **As W3C work on MiniApps progresses we may broaden our work to more use cases**



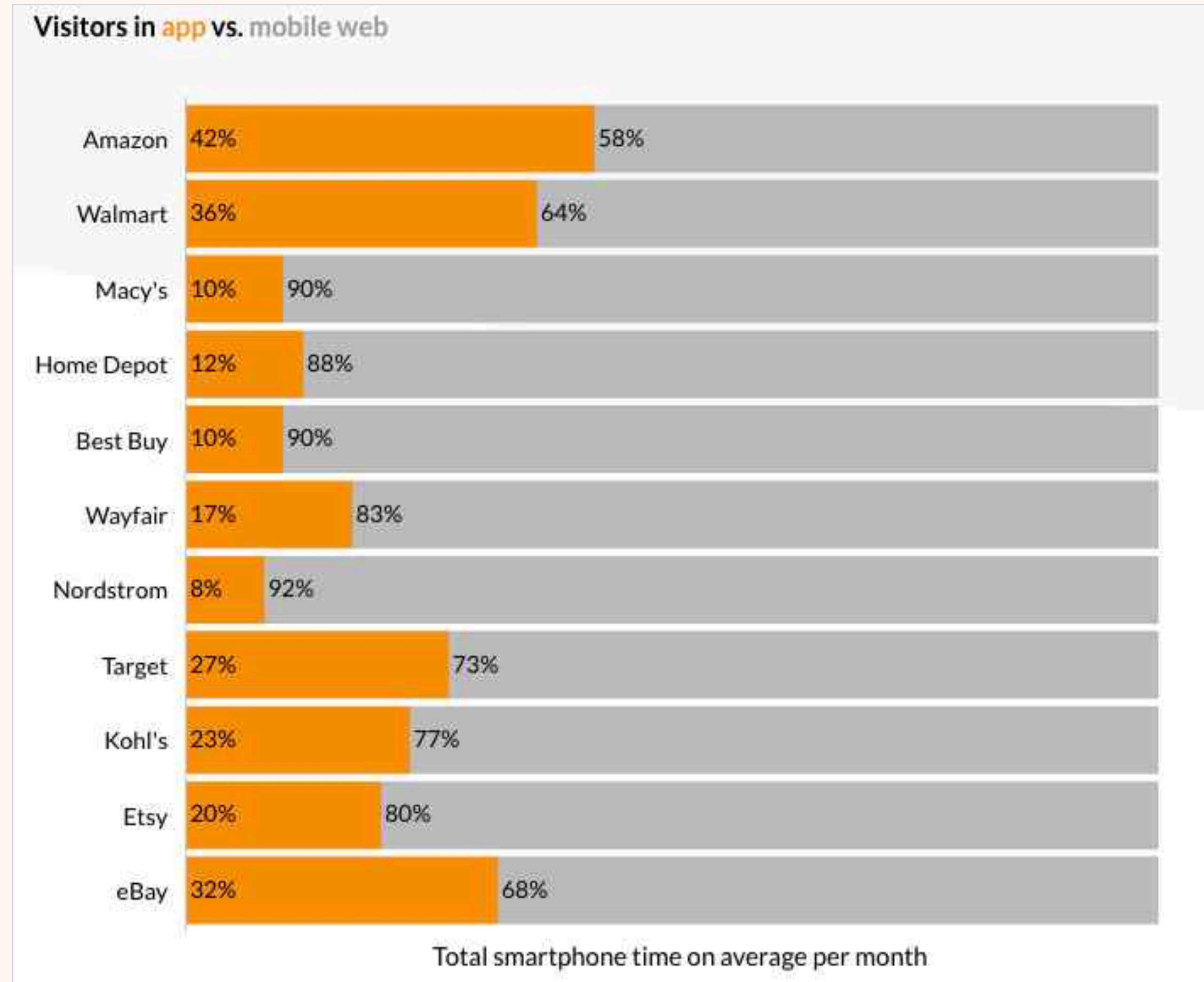
# TIME IN MOBILE V WEB

- People spend lots of time in native apps
- Time spent naturally varies by app



# VISITORS TO MOBILE V WEB

- **However, many people visit Web sites from their phone (visitors v. minutes)**
- **We want to make it easier and more secure for those users to complete transactions**



---

# REMEMBER DESKTOP, TOO

## Time spent in retail apps (US):



## Time spent in travel apps (US):

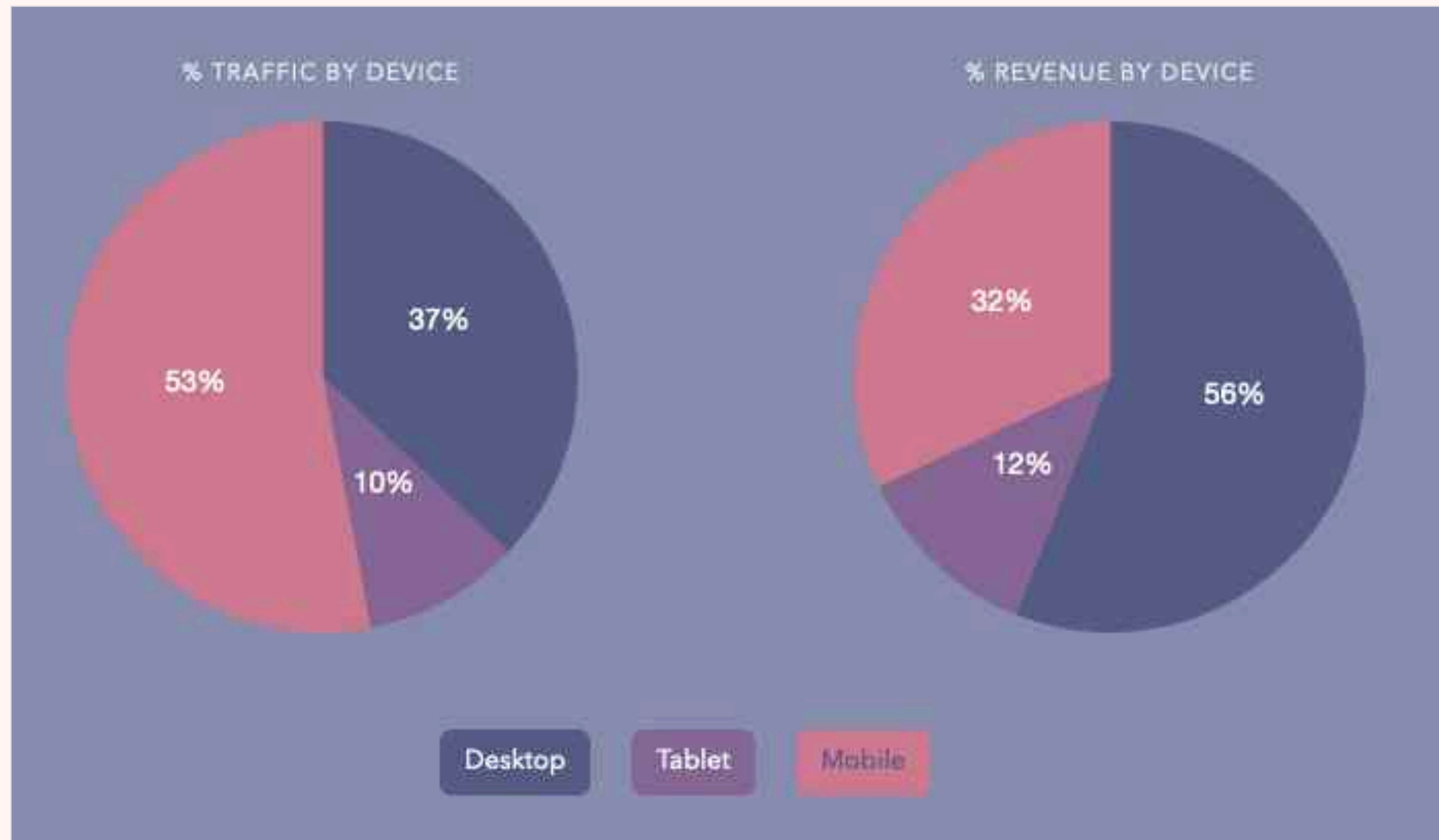


## Time spent in food apps (US):



---

# MOST REVENUE STILL FROM DESKTOP



---

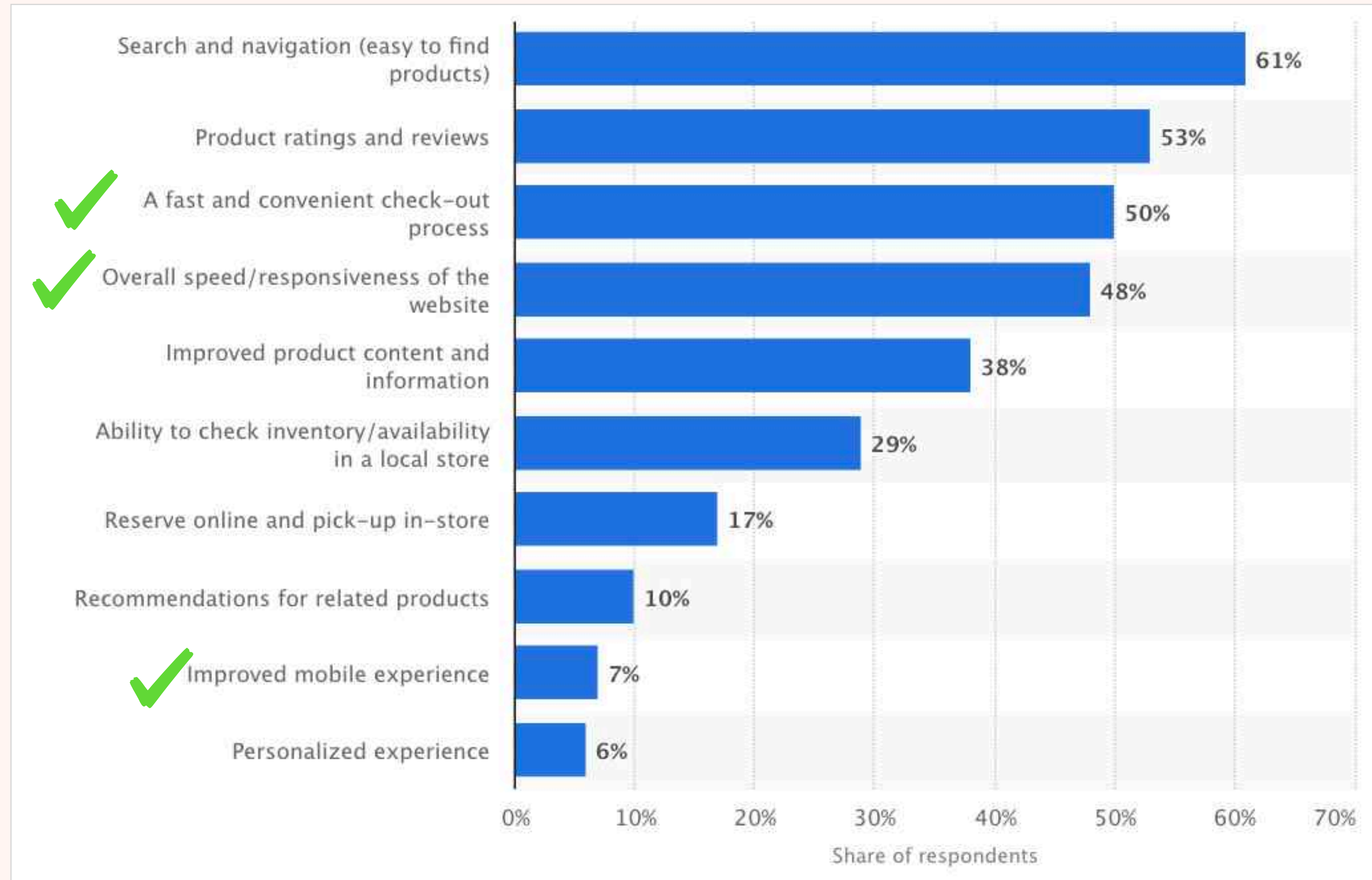
## SUMMARY

# SIGNIFICANT REVENUES DEPEND ON GOOD *WEB* EXPERIENCE





# CONSUMER REQUIREMENTS



✓  
= new browser capabilities can help

---

# GOALS OF WEB PAYMENTS

- **Streamline checkout**
- **Increase payment security and reduce fraud**
- **Enhance user privacy**

*After several years of experience, our priorities for achieving these goals have evolved.*

---

# SCOPE OF WORK

- **ECommerce from Web sites and Web apps**
- **Mobile and desktop**
- **User can pay with native apps, Web apps, or built-in browser capabilities**

---

# WPWG PARTICIPATION

Airbnb

Amazon

American Express

Apple

Barclays Bank

BlueSnap

Brave Software

Canton Consulting

Capital One

China Mobile

Coil Technologies

Conexus

Discover

Entersekt

Facebook

Fiserv

Google

Hedera Hashgraph

Huawei

IFSF

ISO 20022 RA

JCB

Klarna

Knowbility

Kodansha, Publishers

Lyra Network

Mastercard

Merchant Adv. Group

Mozilla Foundation

NACHA

Netflix

Nok Nok Labs

Pundi X

Rakuten

Ripple

Samsung

Shopify

Stripe

The Clearing House

Verizon

Visa

Worldpay/FIS

Yubico

---

# INITIAL PRIORITIES

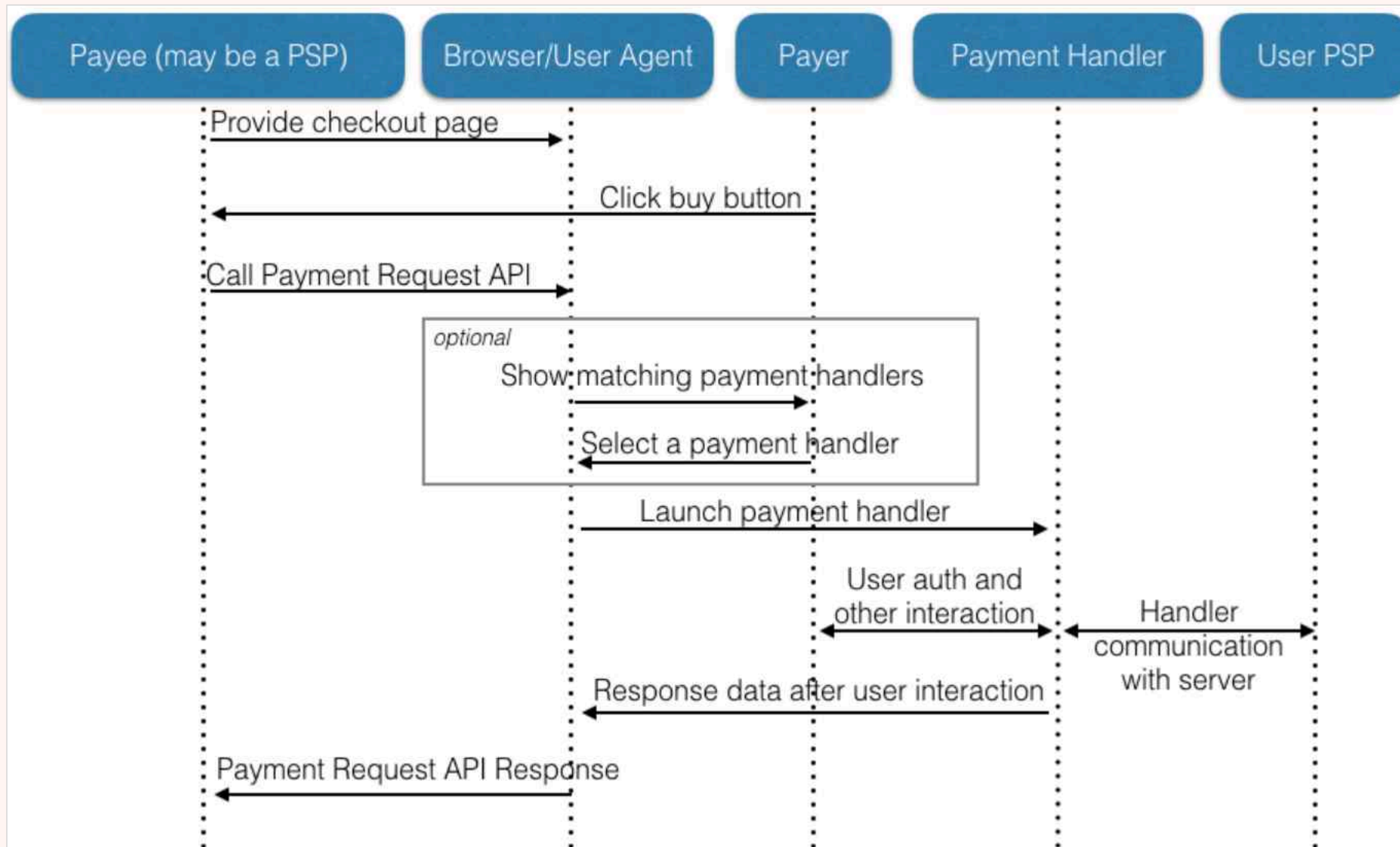
- **One click pay:** streamline checkout by moving data storage (“card on file”) from merchant to browser and payment apps in order to reduce typing and enable for “one click pay” on the Web.
- **Single buy button:** for guest checkout, streamline checkout by reducing selection noise (“NASCAR effect”).
- **Payment method diversity:** standards to facilitate checkout with payment apps will increase payment method diversity for Web checkout.

---

# PAYMENT METHOD DISCUSSIONS

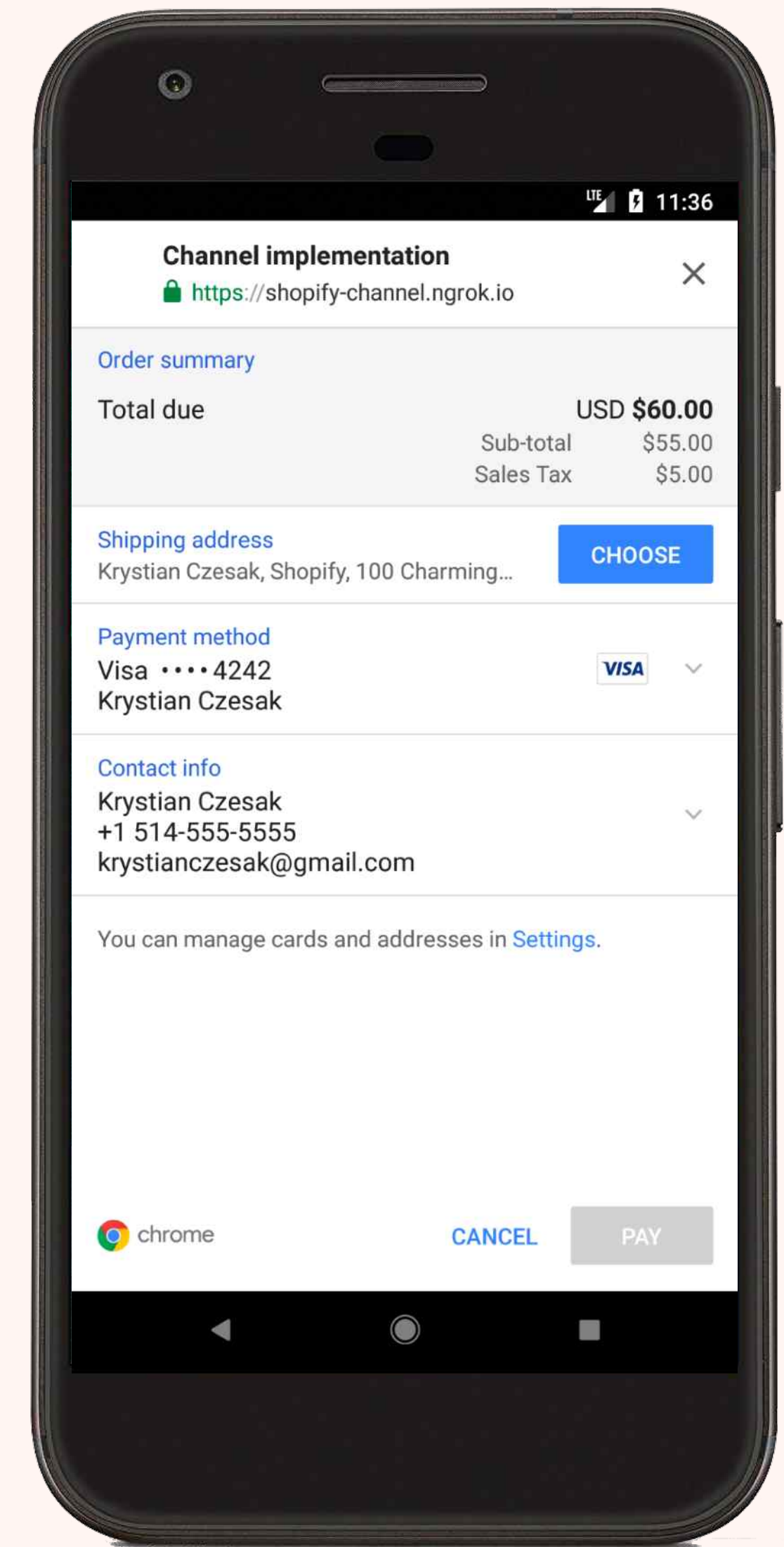
- **Cards (basic card, EMV<sup>®</sup> 3DS and SRC)**
- **Digital wallets (Google Pay, Apple Pay, Samsung Pay, Alipay, etc.)**
- **ACH (with NACHA)**
- **Open Banking (Berlin Group, STET, Open Banking UK, ISO 20022 RA)**
- **Streaming payments (“Web Monetization”)**

# GENERAL PAYMENT REQUEST FLOW



# PAYMENT REQUEST API

- **Streamlines checkout through re-use of stored data**
- **Consistent use experience across sites helps speed up conversions**





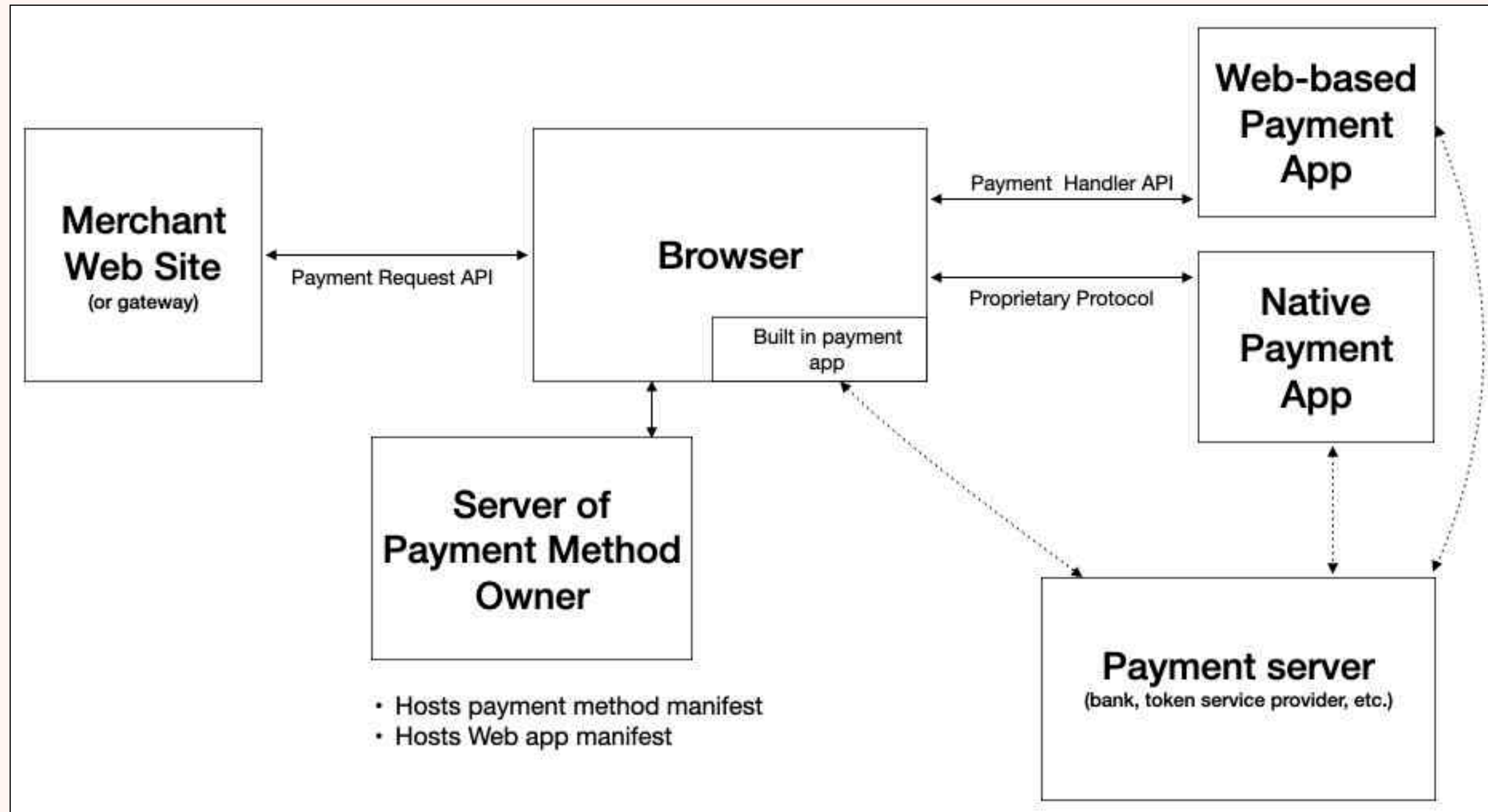
# PAYMENT HANDLER API

- Encourages innovation in payment apps
- Modal window superior UX to redirect and increases security

The screenshot displays a checkout page for 'PIPES N STUFF'. The main page shows the 'Checkout' section with 'Payment details' and 'Billing details' forms. A modal window titled 'Review your payment' is overlaid, showing an order summary for 'Anvil L/S Crew Neck - Grey M x1' with a total due of USD \$1,045.00. The modal offers a 'Pay with QR Code' option and includes a 'Choose' button. Below the modal, the 'Billing details' form is visible, with fields for 'First Name' and 'Last Name'. To the right, a summary table shows the total amount of \$1,045.00, including shipping and tax.

	Total
Grandix ALX7054	\$850.00
Shipping	\$25.00
Tax	\$170.00
<b>Total</b>	<b>\$1,045.00</b>

# CONNECTING THE ELEMENTS



---

# EARLY ADOPTION FEEDBACK



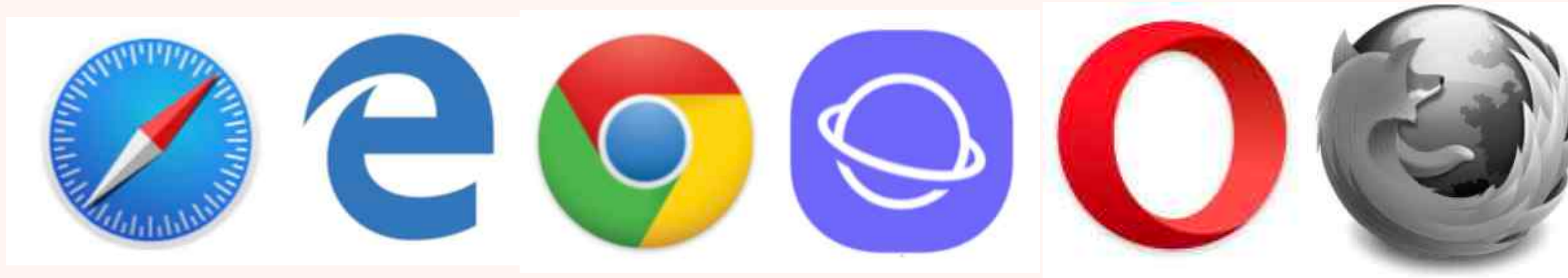
- **[With Payment Request], the median time for buyers with `canMakePayment() = false` is 3:17 whereas the median time for buyers with `canMakePayment() = true` is 2:25. This is promising, as both medians are faster than our standard checkout.” [\(Read more\)](#)**

The J.Crew logo, consisting of the text 'J.CREW' in a serif font, with 'J.' and 'CREW' separated by a period and space.

- **The firm has also sought to make it easier for consumers to convert at checkout with the “Payment Request API” ... Wait times for checkout on J.Crew’s online store have decreased 75 percent from more than two minutes four months ago, according to a J.Crew spokeswoman.” [\(Read more\)](#)**

---

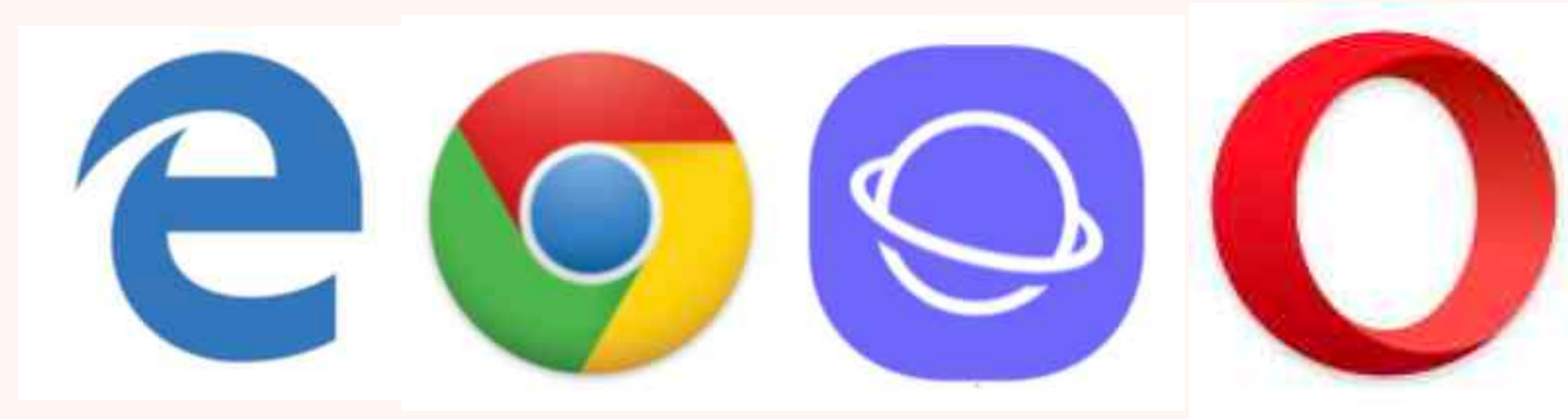
# PAYMENT REQUEST IMPLEMENTATION STATUS



- **Chrome, Edge, Safari, Opera, and Samsung Internet today ship with support for Payment Request API. Experimental in Firefox.**
- **Stripe, Braintree, Facebook, WePay, Bluesnap, Paysafe, BS Payone provide customers support for Payment Request API.**

---

# PAYMENT HANDLER IMPLEMENTATION STATUS



- **Chromium-based browsers ship with Payment Handler API support (Chrome, Edge, Samsung, Opera)**
- **Numerous experiments at various times, including: Barclays, Capital One, Coil, Credit Suisse, Facebook, Klarna, Lyra Networks, Shopify, Stripe, Worldline, and Worldpay.**

---

# API AVAILABILITY IN CHINA

- **Market share (according to statcounter):**
  - **Mobile: 80% Android**
  - **Desktop: 85% Windows**

---

# EVOLUTION OF PRIORITIES

- **Finalize PR API 1.0:** Stable implementations for multiple years in multiple browsers are used by some merchants and payment service providers for access to native and Web payment apps.
  - ***Current expectation is mid-March 2021***
- **Prioritize low-friction authentication:** PSD2 requirements in Europe for strong customer authentication and widespread adoption of Web Authentication (browsers, authenticators) have led to a focus on streamlining authentication and supporting transaction confirmation (“dynamic linking”)
- **Support frictionless risk assessment:** Industry stakeholders also want frictionless risk assessment (e.g., EMV<sup>®</sup> 3-D Secure). We want to support it in a way that protects user privacy preferences.
- **Generalize in-context display:** Payment app providers like the “modal window” of Chrome’s Payment Handler API implementation. Some have asked for that functionality available outside of a payment app.

---

# SECURE PAYMENT CONFIRMATION (SPC)

- **Low-friction authentication and transaction confirmation within Payment Request API**
- **Browser grants special powers based on knowing “the user has taken steps to pay”:**
  - **Fewer user gestures (lower friction) than using APIs “out of the box”**
  - **More origins can authenticate the user compared to ordinary Web Authentication**
- **Read the [SPC proposal](#) from Stripe, Google, Coil**

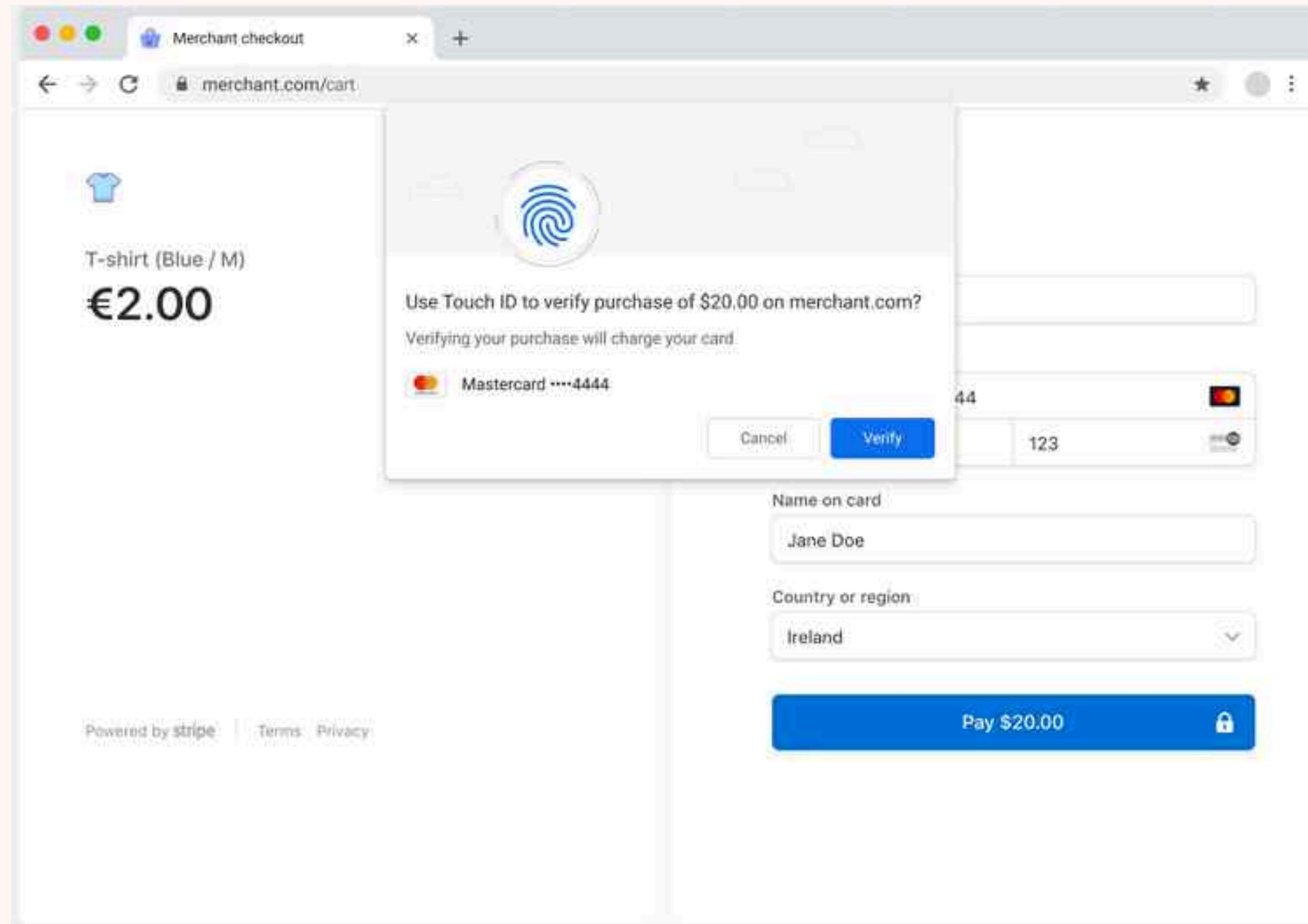


---

# SPC BENEFITS

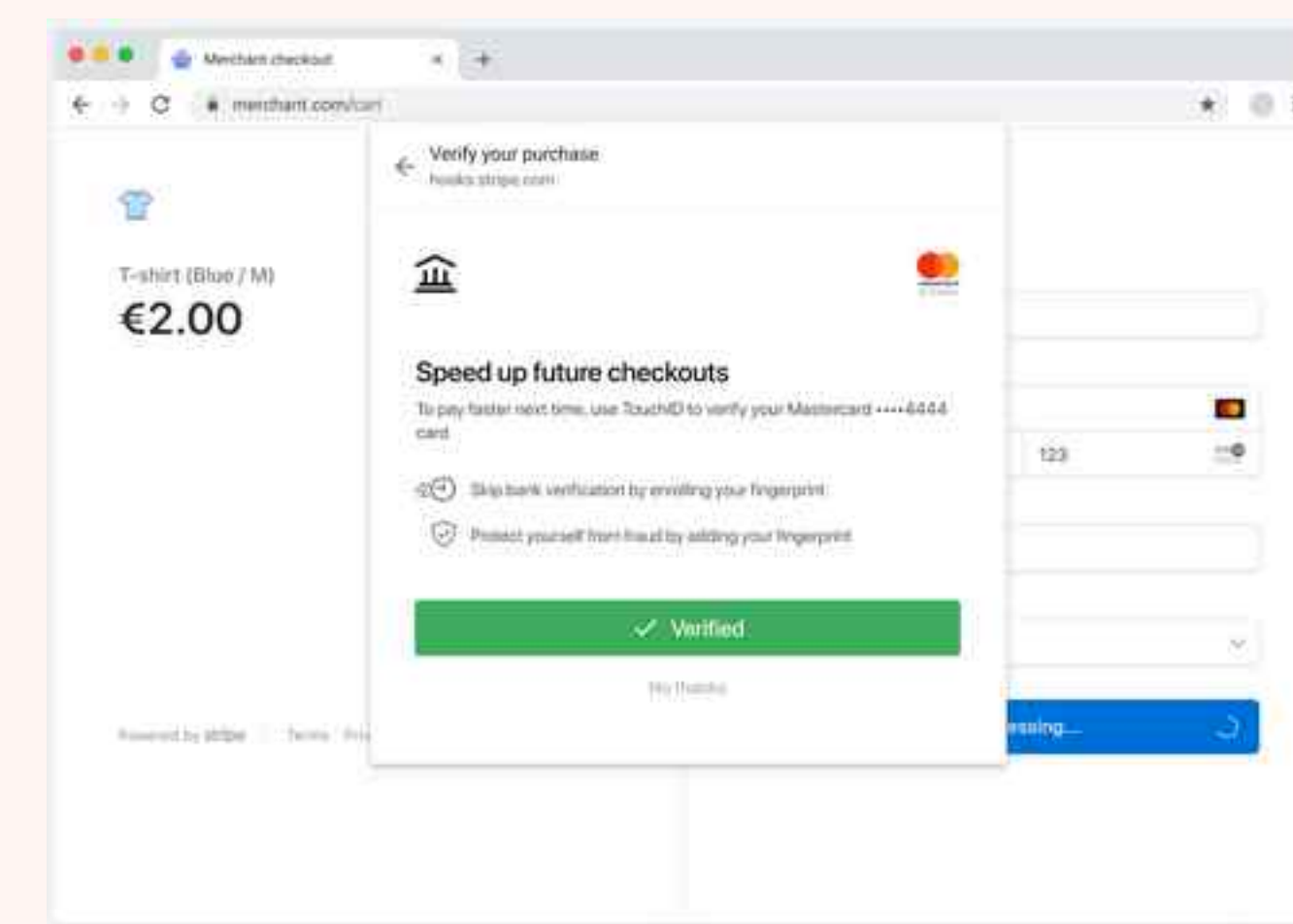
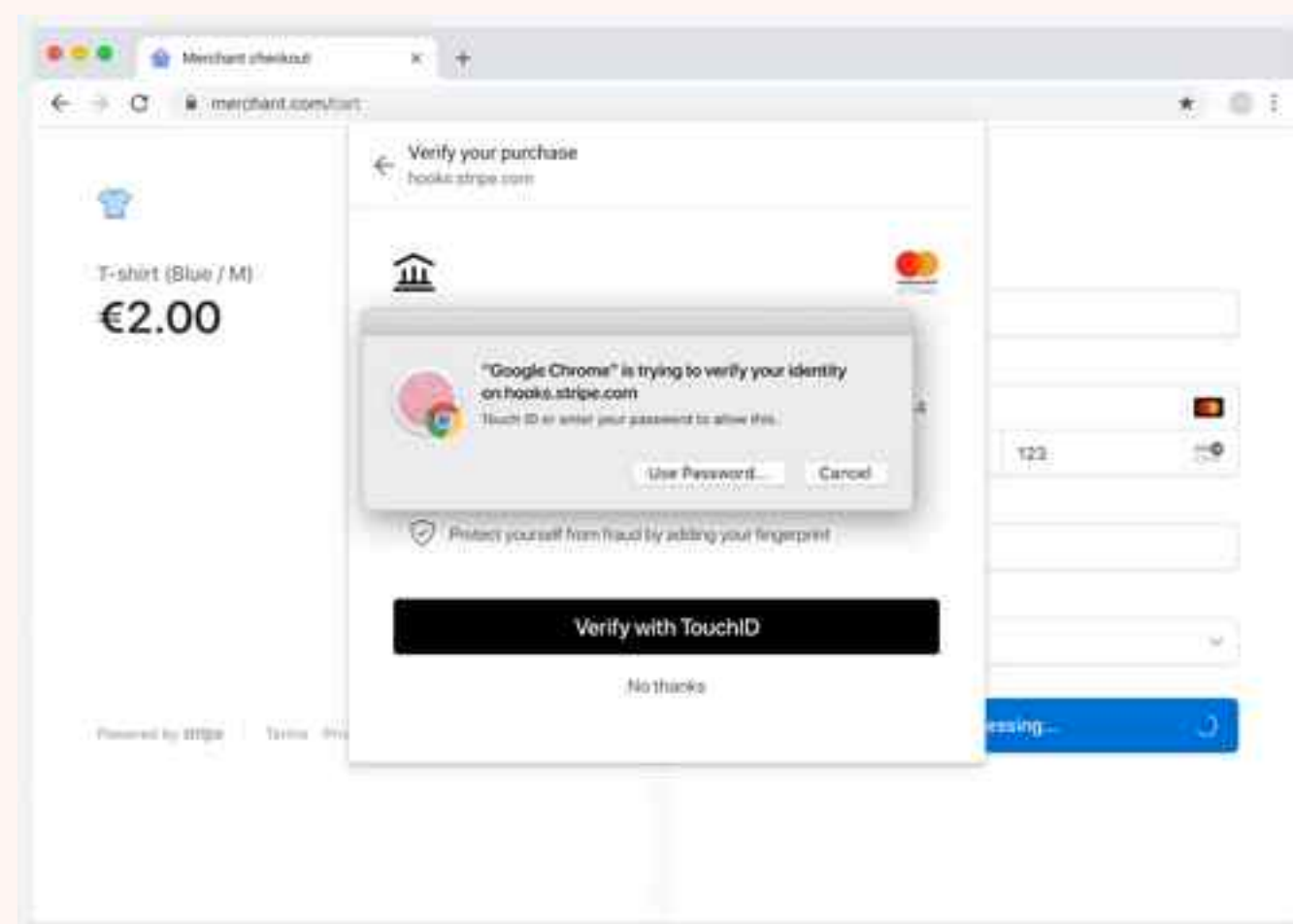
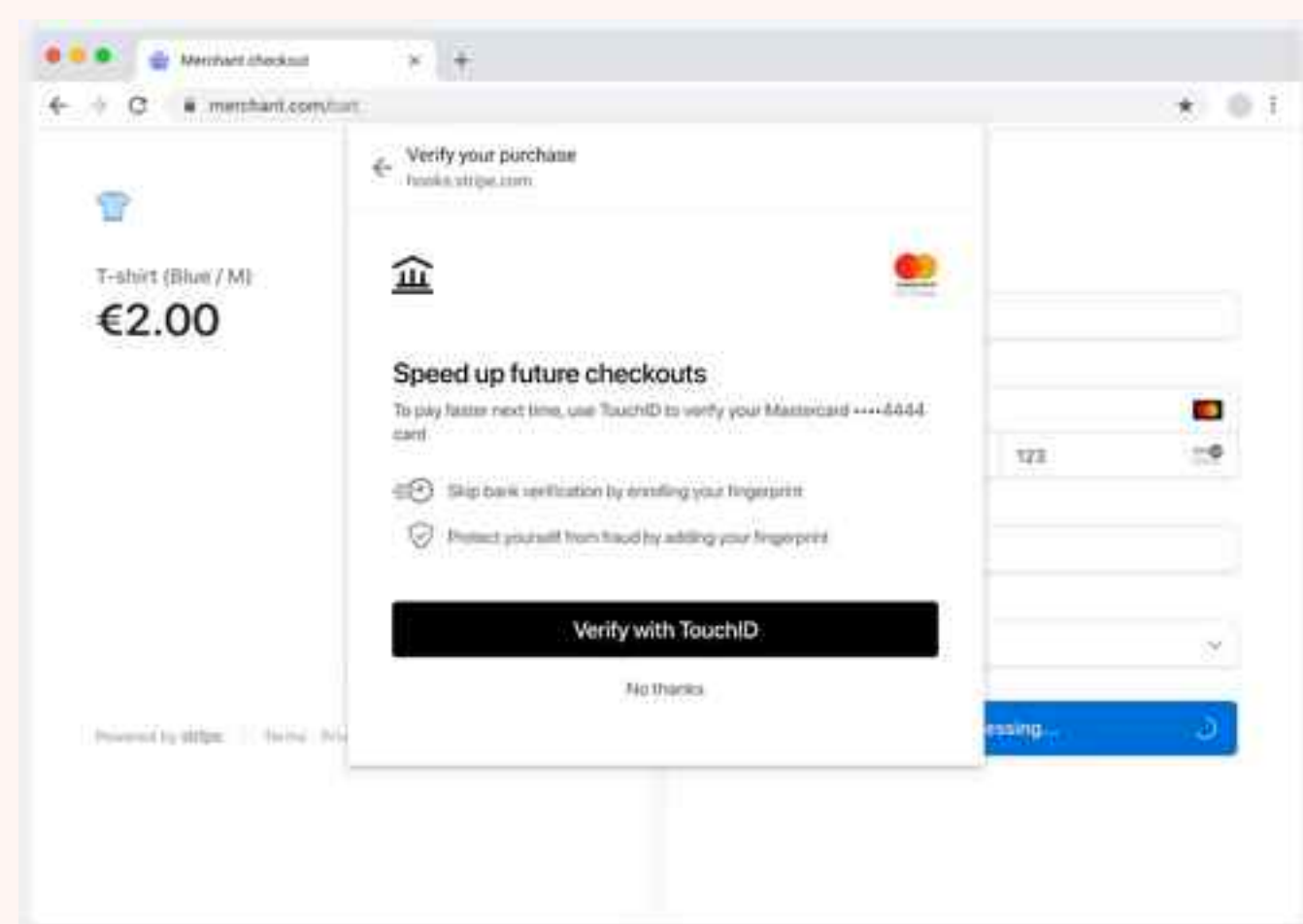
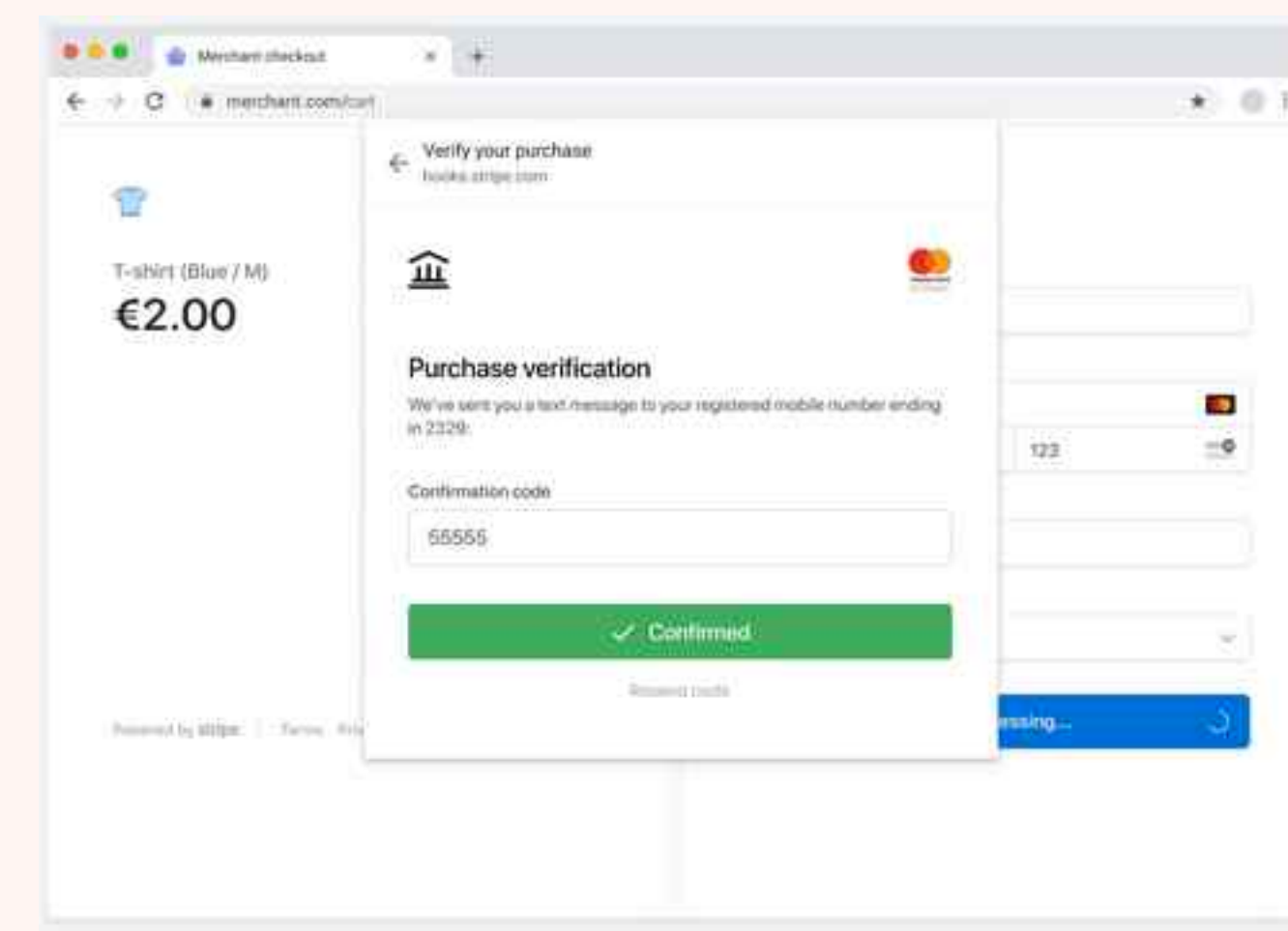
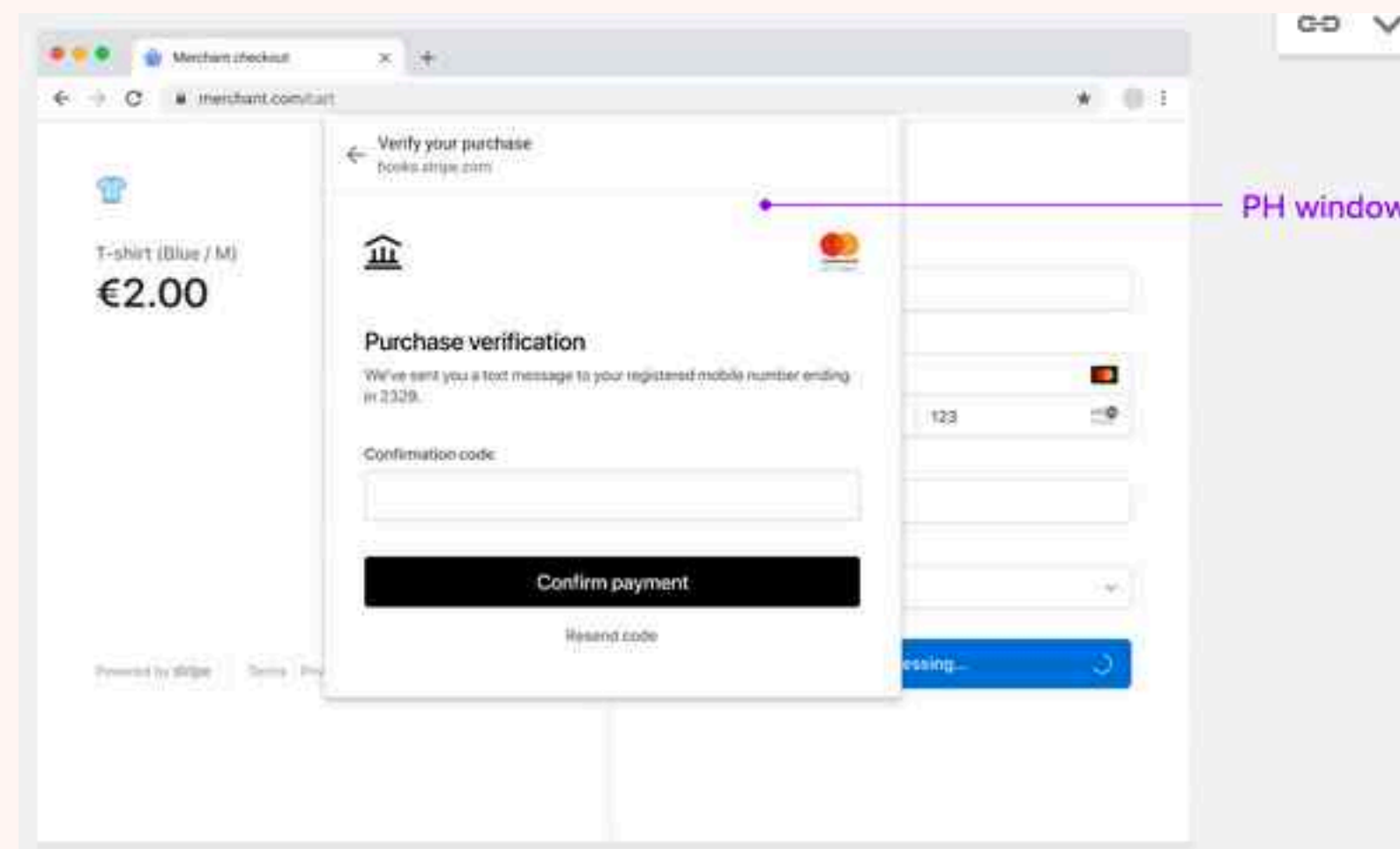
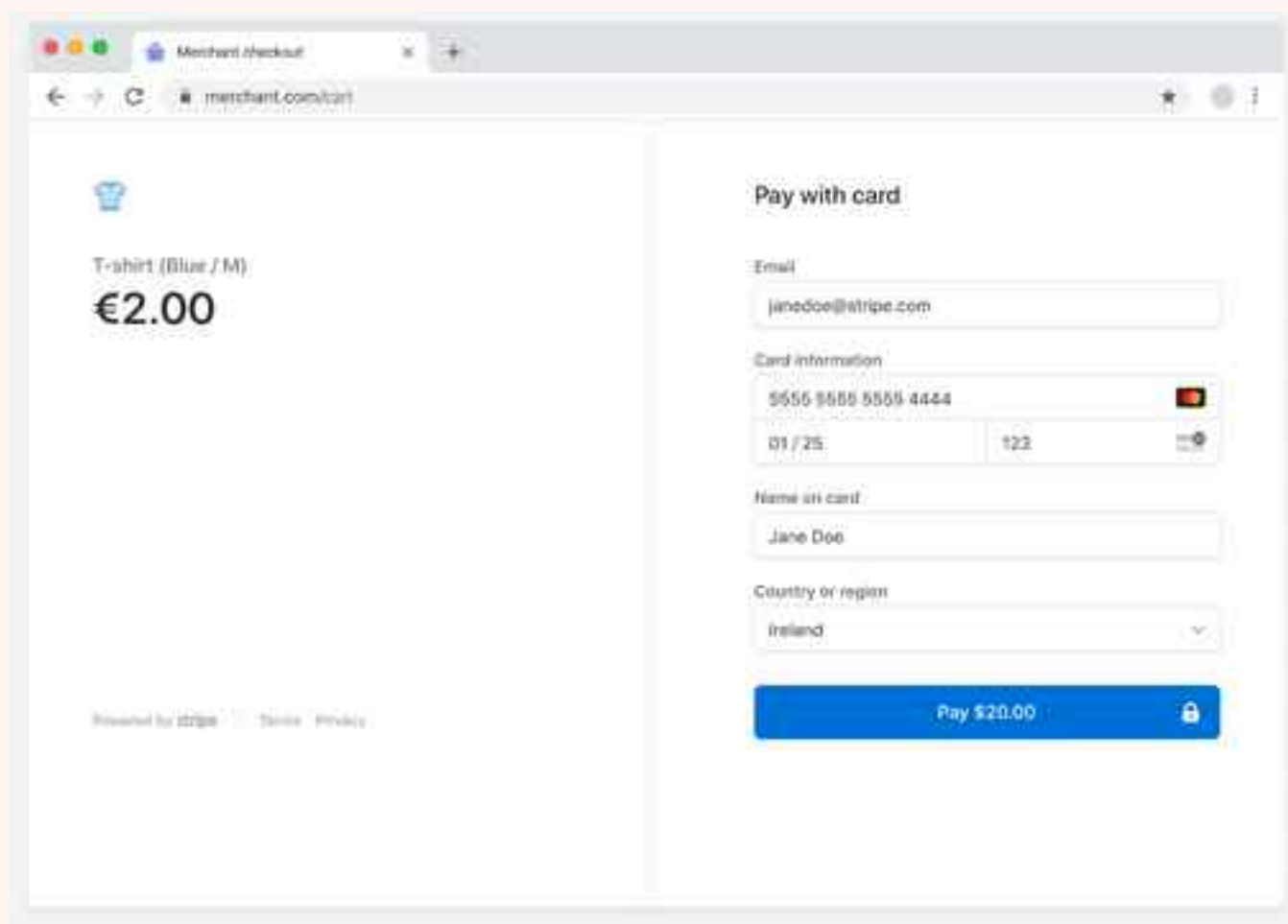
- **Increases consumer confidence with biometric payment confirmation in trusted UI**
- **Adds a secure, privacy-preserving payment authentication primitive to the Web**
- **Aims to satisfy PSD2 requirements for:**
  - **Strong customer authentication (SCA)**
  - **Transaction confirmation (“dynamic linking”)**
- **May reduce need to embed code from third parties in checkout pages**
- **May reduce latency and increase availability of EMV<sup>®</sup> 3DS compared to one-time password (OTP)**

# SPC MOCKUPS

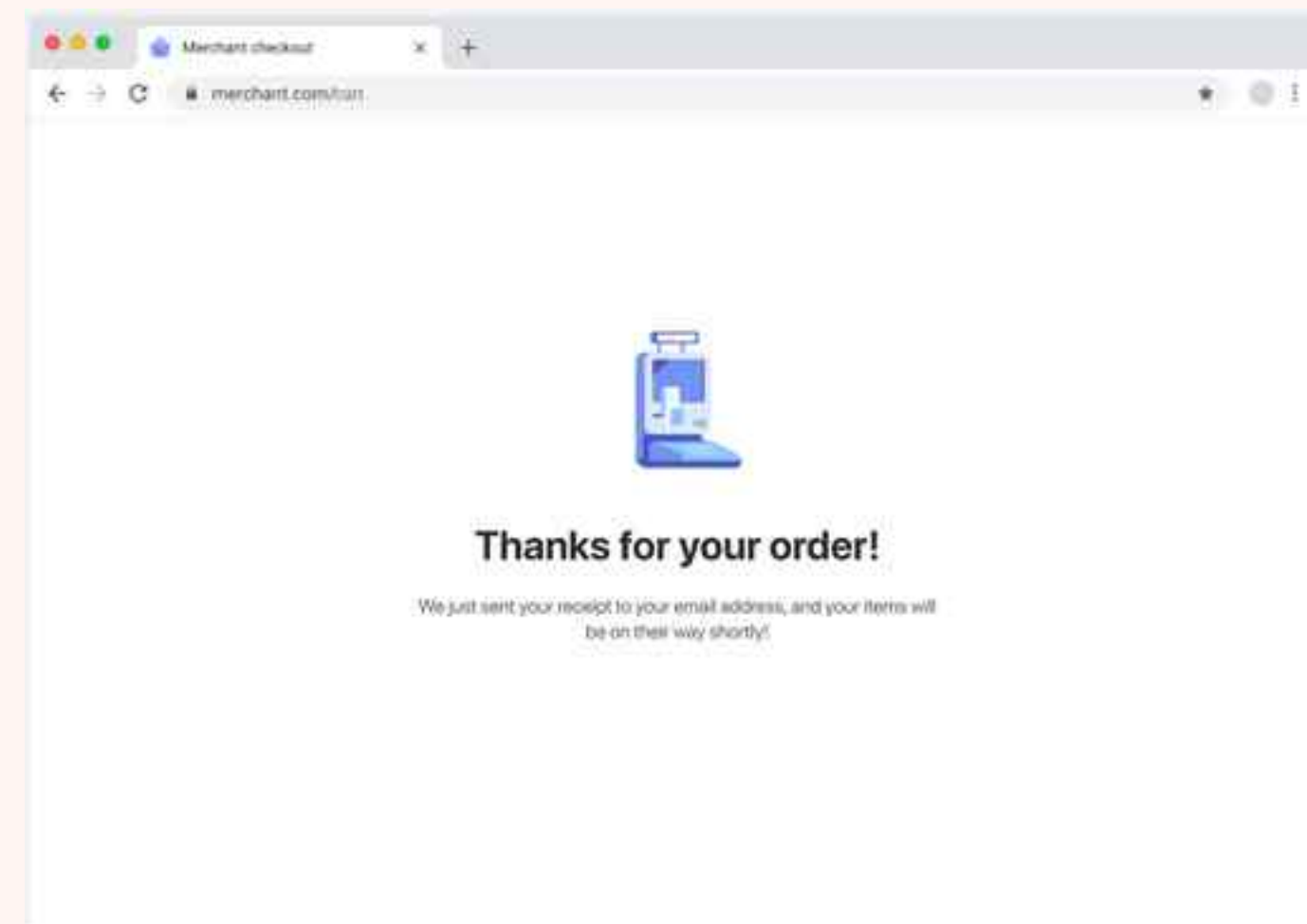
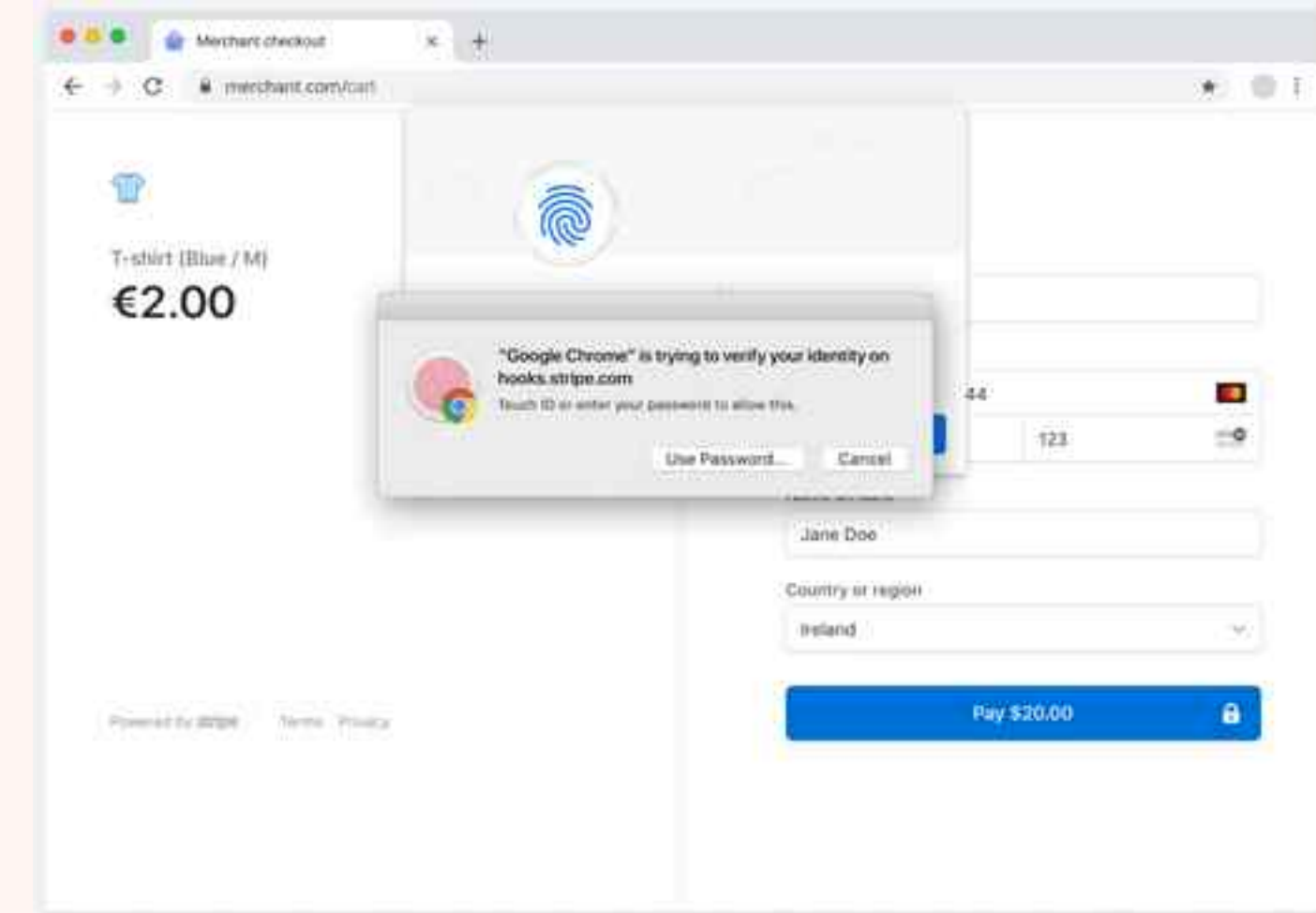
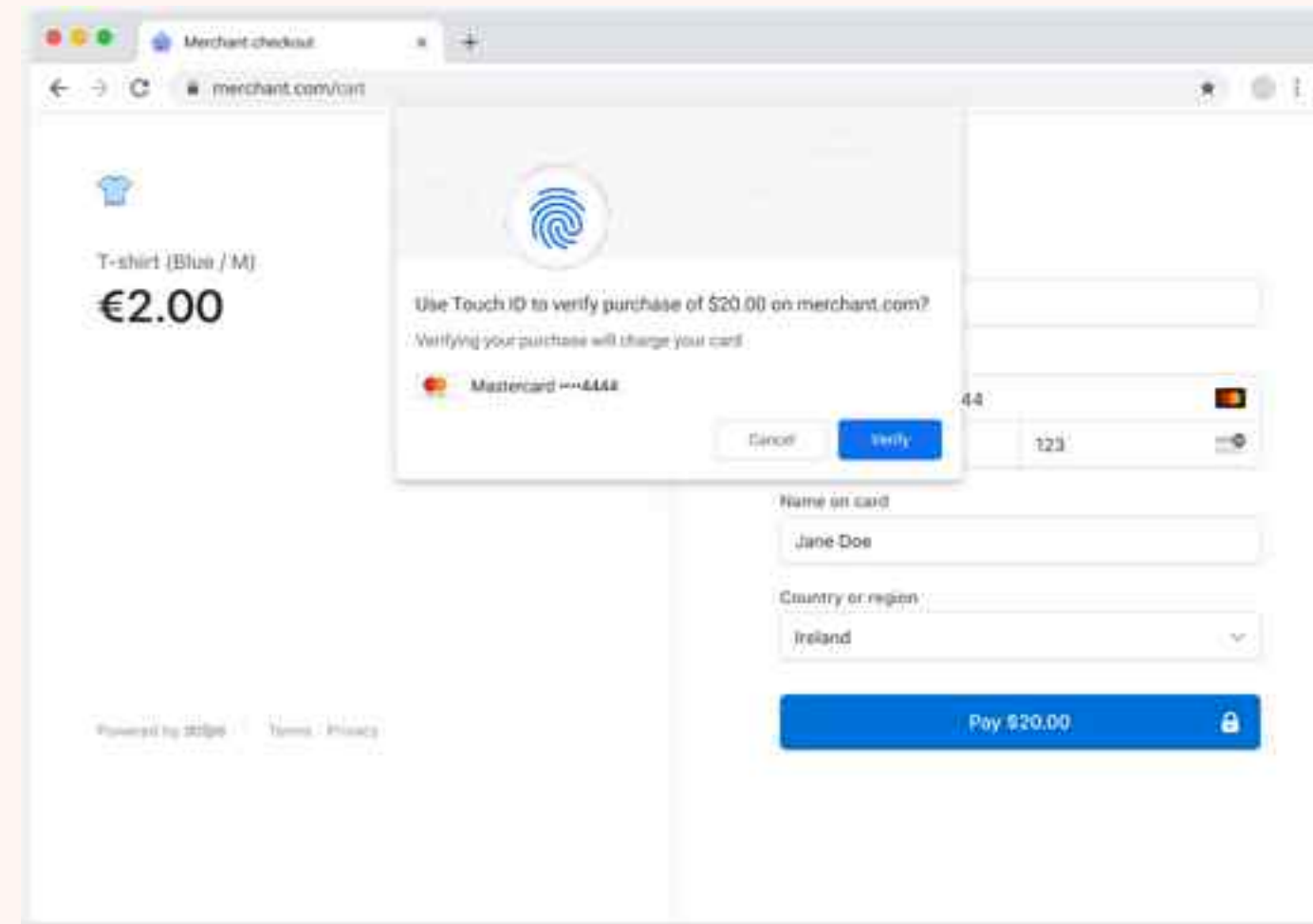
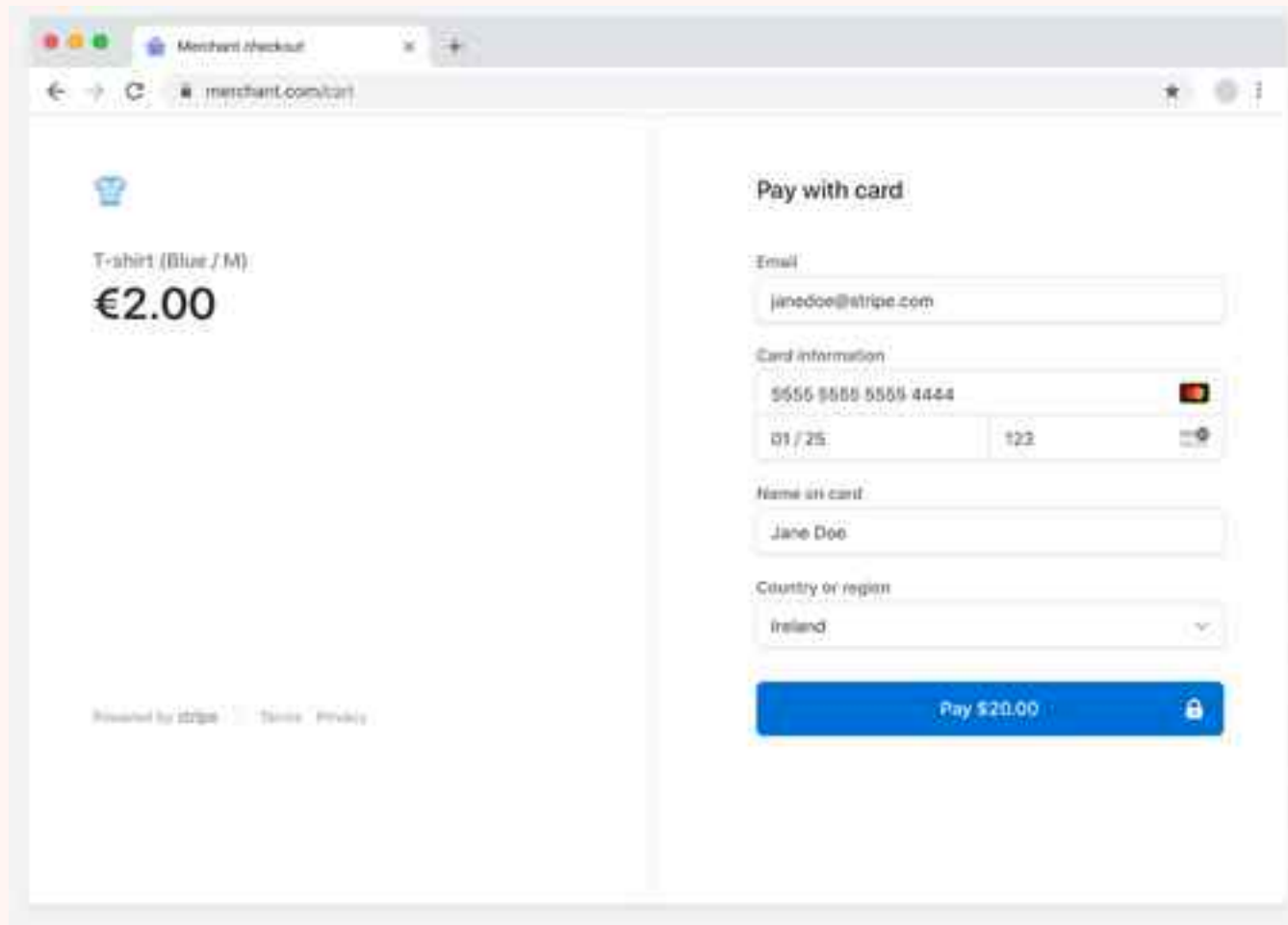


Mockups

# ENROLLMENT



# CHECKOUT



---

# SPC + 3DS PILOT (Q4 2020)

- **Stripe pilot program hypothesis: Users will prefer Web Authentication to OTP in an EMV<sup>®</sup> 3DS step-up**
- **We expect some experimental data in early 2021**
- **If hypothesis holds, Web Payments Working Group likely to focus on SPC specification**

---

# FRICITIONLESS RISK ASSESSMENT

- **SPC is “low-friction” but industry representatives also seek “zero-friction” risk assessment**
- **EMV<sup>®</sup> 3DS frictionless flow implemented today likely to break due to browser privacy changes:**
  - **3-party cookies (e.g. SameSite by default)**
  - **Restrictions on storage, e.g. IndexedDB, local/sessionStorage (e.g. Safari’s Storage Access API proposal)**
  - **Fingerprinting entropy reduction**
  - **Cross-site postMessage**
  - **Link decoration**
- **See [EMVCo/FIDO note](#) on using Web Authentication metadata for risk assessment**

---

# W3C GROUPS

- **Standardization: Web Payments WG and Web Authentication WG**
- **EMVCo, FIDO, W3C Coordination: Web Payment Security IG**
- **Education and Requirements Gathering: Merchant Business Group**
- **More about W3C Groups**

---

# WPSIG: EMVCO, FIDO, W3C COORDINATION

- **Chartered Web Payment Security Interest Group (WPSIG) in 2019**
- **Published How Technologies Relate in September 2020; see press release**
- **Topics of interest:**
  - **Web Authentication / FIDO with 3DS (e.g., for risk assessment or with SPC for step-up)**
  - **Secure Remote Commerce (SRC) with Payment Request / SPC**
  - **QR Codes (new)**



---

# WPSIG PARTICIPATION

Aetna	HID Global	Rakuten
Airbnb	Huawei	Ripple
Alibaba	Infineon	Reach
American Express	ISO 20022 RA	Shopify
Assa Abloy	JCB	SK Telecom
Australian Payments Network	Knowbility	Stripe
Bank of America	Lenovo	StrongAuth
Brave Software	LastPass	Telecommunications Tech. Assn.
Capital One	Line	Thales Group
Certus Cybersecurity	LogMeIn	The Clearing House
Coil Technologies	Mastercard	2 Open China Ecommerce
Chase	Merchant Advisory Group	UnionPay
Conexus	Microsoft	Verizon
Discover	Netflix	VinCSS
Entersekt	Nok Nok Labs	Visa
Global Payments	Onespan	Who Are You Holdings
Google	PayPal	Worldpay
Hedera Hashgraph	Ping Identity	Yubico

---

# MERCHANT BUSINESS GROUP

- **W3C launched a Merchant Business Group in 2020**
- **Mission: improve the Web for people and organizations that sell goods or services, or accept donations online**
- **Activities include:**
  - **(Non-technical) Education about Web topics relevant for merchants**
  - **Requirements gathering as input to standardization**

---

# THANK YOU!

➤ **Questions? Ian Jacobs <[w3.org](http://w3.org)>**