Streamlining Web Payments

Ian Jacobs, W3C

26 April 2017

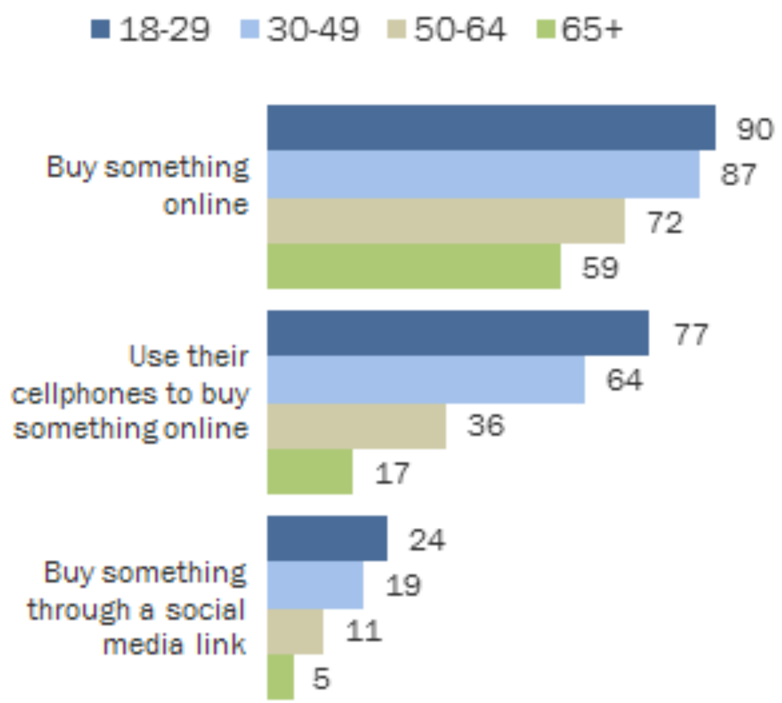
The Web Was Not Designed for Payments

Source: marketo.com

Young People Prefer Mobile Commerce

Online shopping popular across age groups, although Americans under 50 especially likely to buy using cellphones

% of U.S. adults in each age group who ever ...

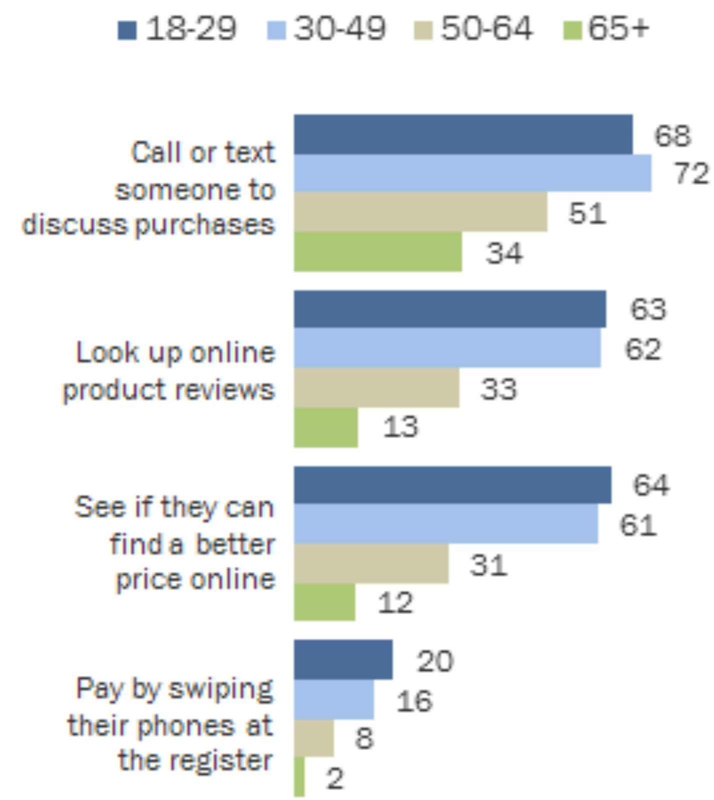


Source: Survey conducted Nov. 24 Dec. 21, 2015.
"Online Shopping and E-Commerce"

PEW RESEARCH CENTER

Those under 50 especially likely to use cellphones to help make purchasing decisions

% of U.S. adults in each age group who ever use cellphones while inside physical stores to ...



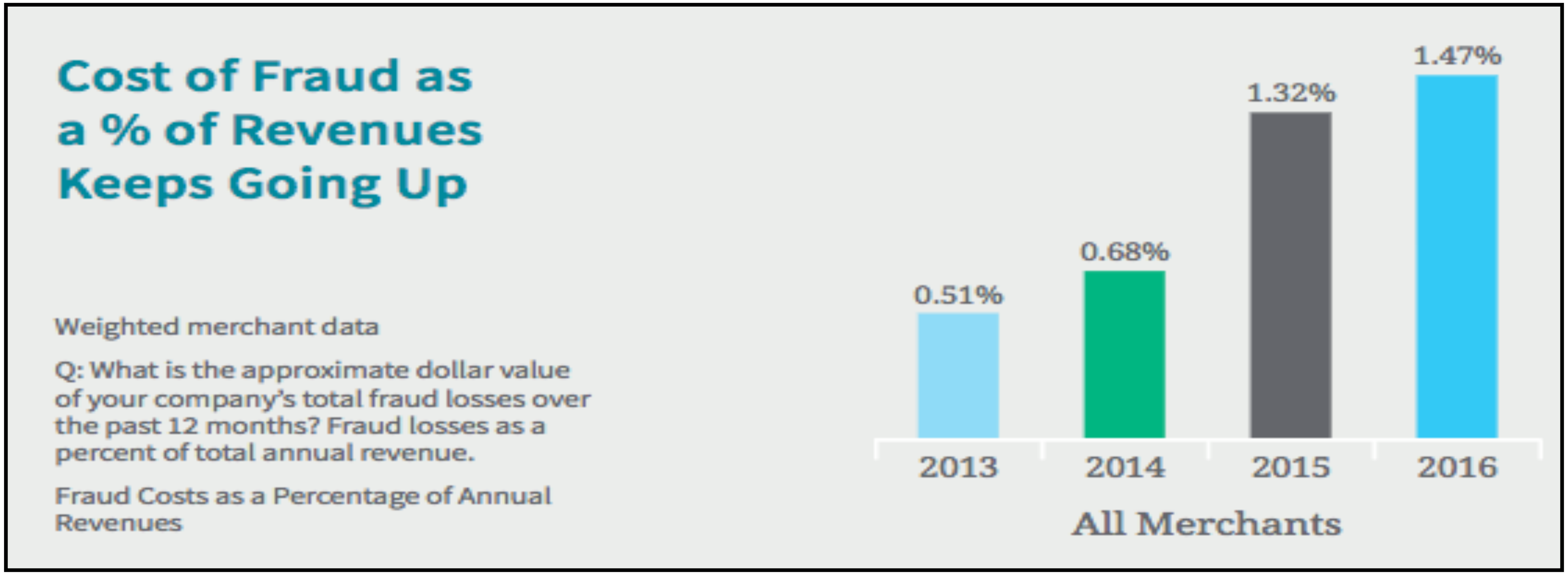
Source: Survey conducted Nov. 24 – Dec. 21, 2015.
"Online Shopping and E-Commerce"

PEW RESEARCH CENTER

Poor Experience => Abandonment

Source: Capital Numbers

Poor Security => Lost Loyalty; Higher Costs



Source: [Lexis Nexis]

Now is the Time to Improve Payments on the Web

"We are long overdue for a payments user interface for the Web."

Tim Berners-Lee, W3C Director
[What if 'One Click' Buying Were Internetwide?]
New York Times, 25 September 2016

W3C®

The World Wide Web Consortium (W3C) is an international community that develops open standards to ensure the long-term growth of the Web.

What Streamlined Checkout Looks Like

Source: merchandisingmatters.com

Example (pay.gov)

Bighorn Canyon NRA Annual Pass

Before You Begin | 1 Complete Agency Form | 2 Enter Payment Info | 3 Review & Submit | 4 Confirmation

Paying online with Pay.gov is safe, secure, and the preferred method to make a payment. To make a payment using one of the below accepted payment methods, please click the Continue to the Form button.

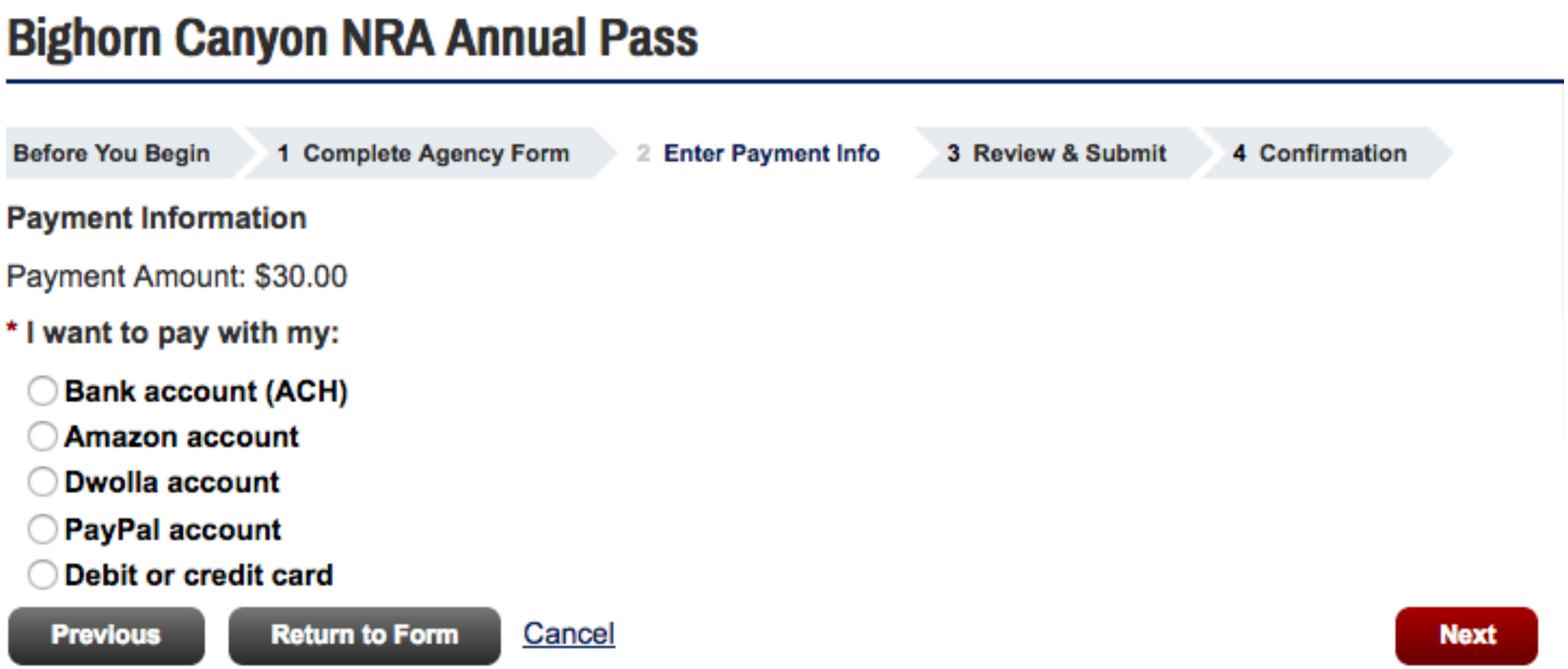
Accepted Payment Methods:

- Bank account (ACH)
- Amazon account
- Dwolla account
- PayPal account
- Debit or credit card

Preview Form Cancel **Continue to the Form**

This is a secure service provided by United States Department of the Treasury. The information you will enter will remain private. Please review our privacy policy for more information.

Selection of payment method



Card Payment

Bighorn Canyon NRA Annual Pass

Before You Begin | 1 Complete Agency Form | 2 Enter Payment Info | 3 Review & Submit | 4 Confirmation

Please provide the payment information below. Required fields are marked with an * .

*** Payment Amount:**

$30.00

*** Cardholder Name**

Ian Jacobs

*** Cardholder Billing Address:**

1600 Pennsylvania Ave NW

…more data required…

ACH Payment

*** Select Account Type**

Select Account Type

*** Routing Number**

Routing Number

*** Account Number**

Account Number

*** Confirm Account Number**

Confirm Account Number

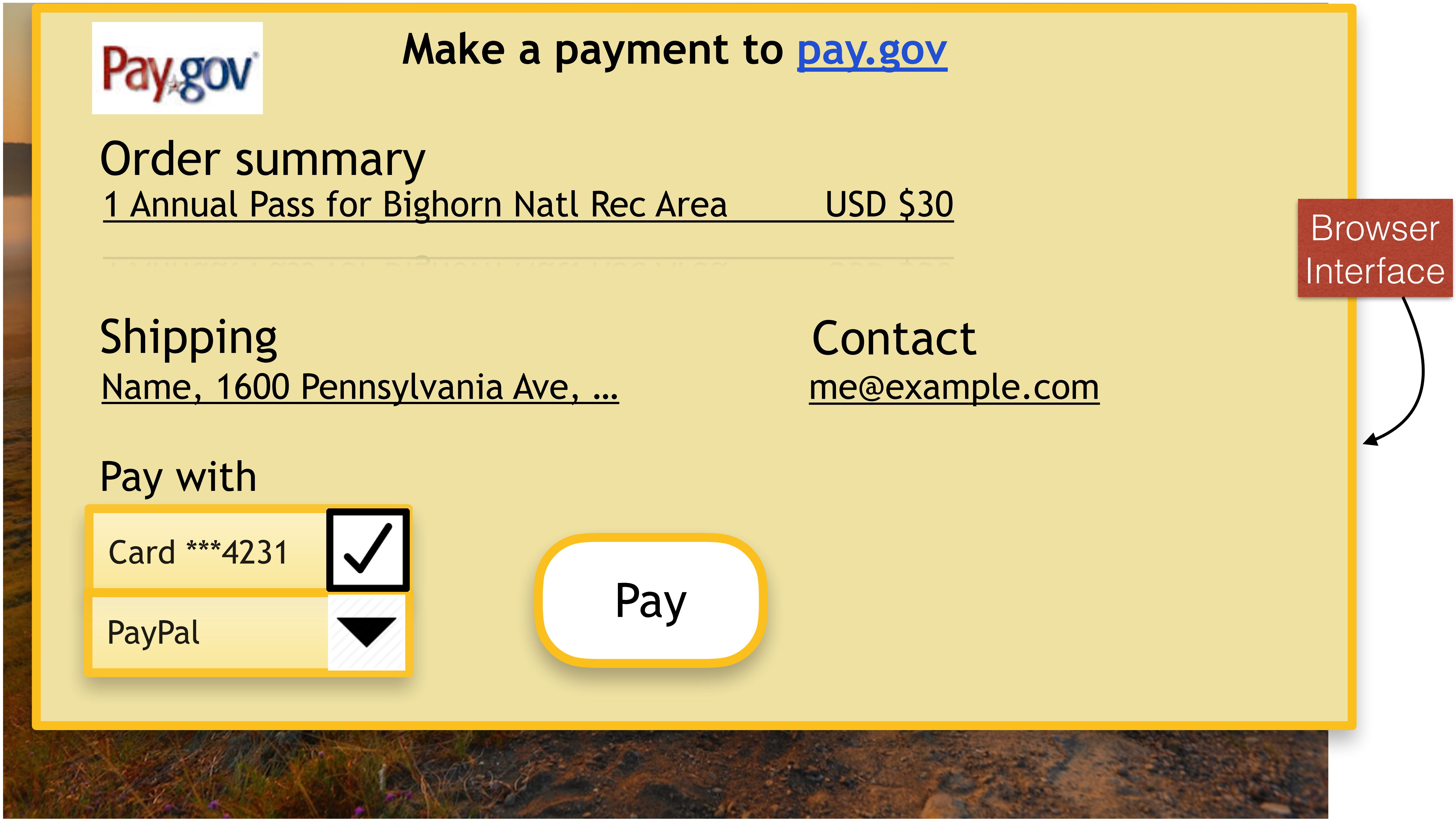
Previous **Return to Form** Cancel **Review and Submit Payment**

…more data required…

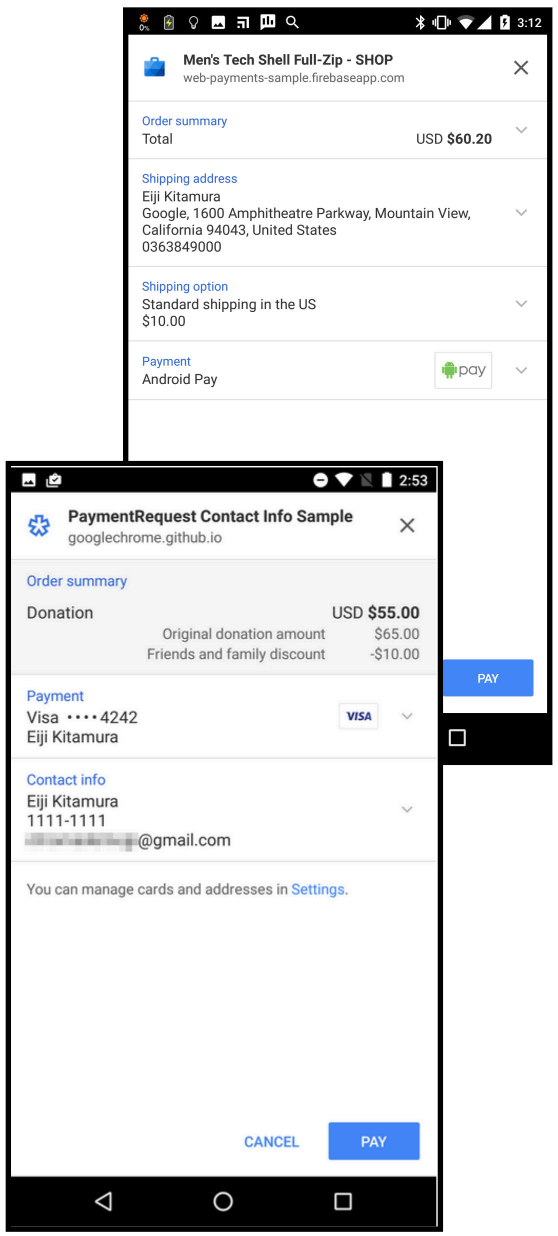

Streamlined pay.gov

Choose passes

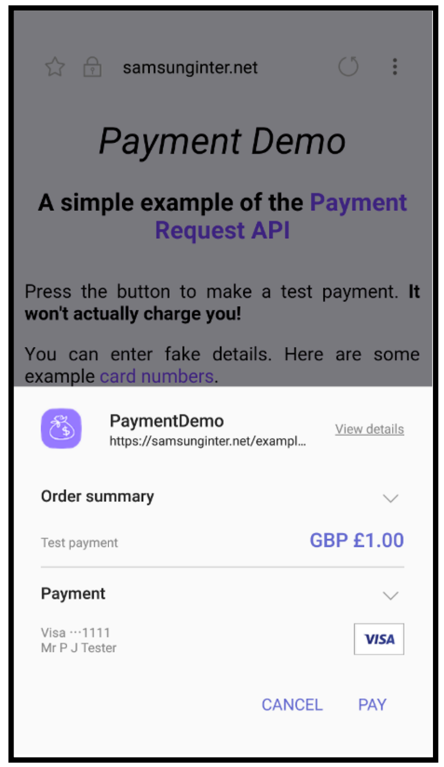
Choose app and pay



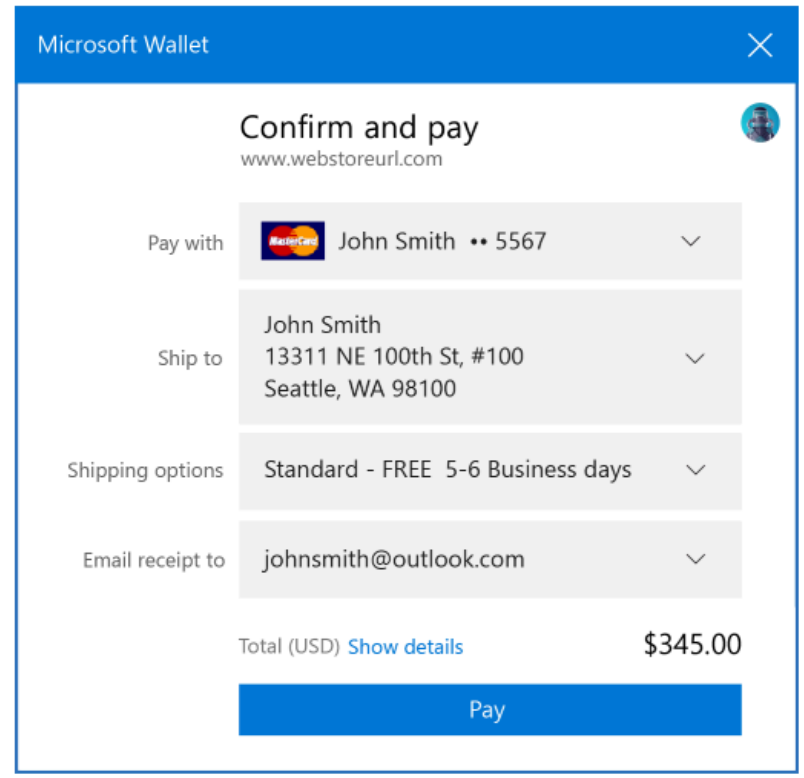
What it Actually Looks Like



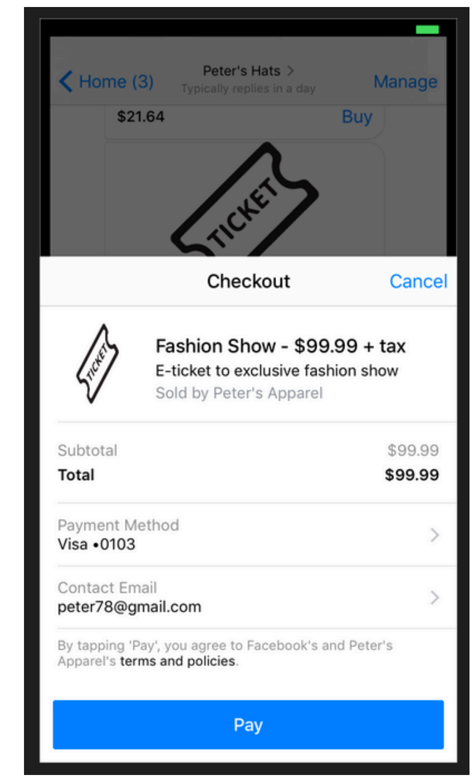
Google



SAMSUNG



Microsoft



facebook

Benefits

User	Less Typing Saves Time, Reduces Errors	Simple, Globally Consistent UX Accelerates Response	Display of Matches Reduces Complexity
Merchant	Simplifies Creation and Maintenance of Streamlined UX	Lowers Cost of Cross-Device Interoperability	Facilitates Integration of Payment Methods (Security, User Preferences)
	Conversions	Customer Satisfaction	Increased Security

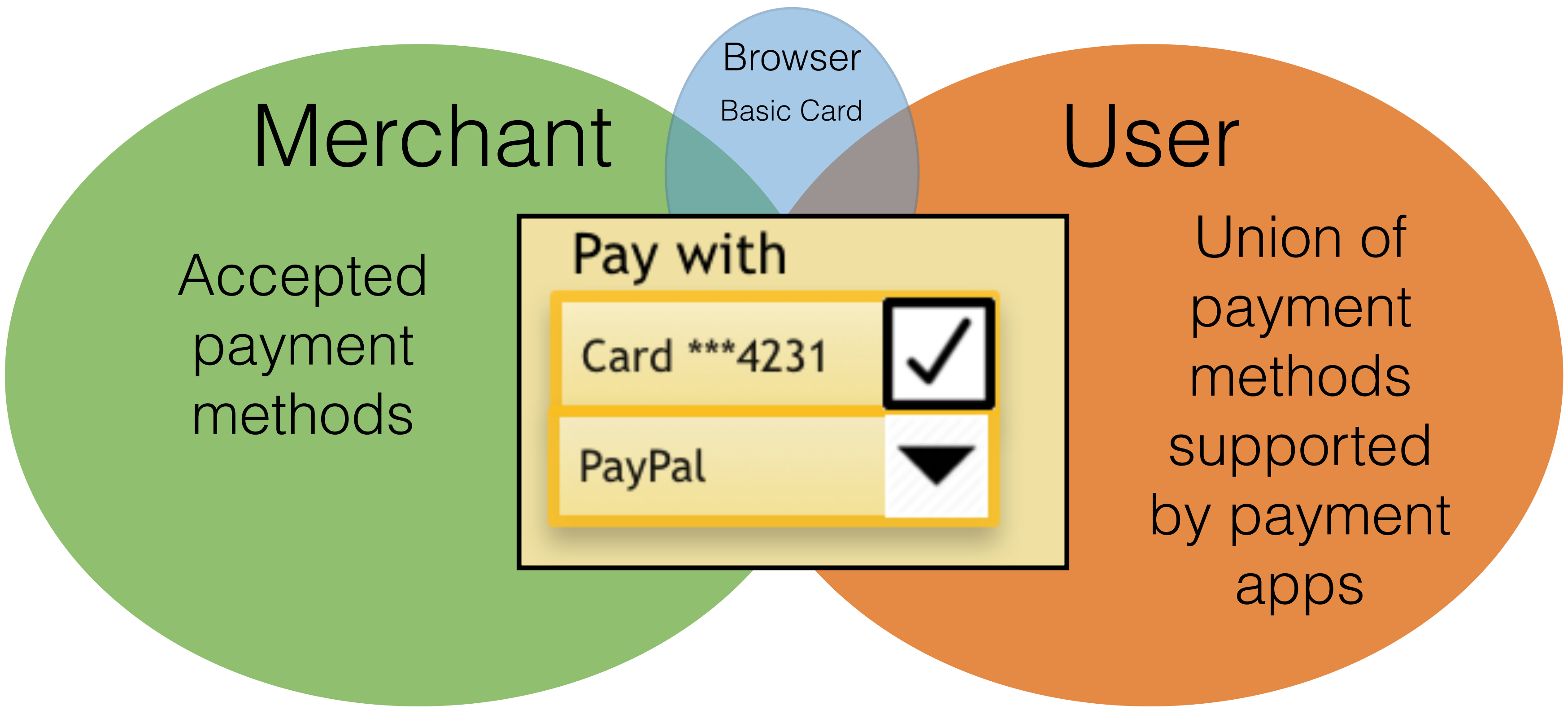
How Streamlined Checkout Works

Source: surfingaustralia.com

Payment Methods v. Payment Apps

- **Payment methods are data**
  - Examples: card payments, *Pay, credit transfer, alternative payment methods
  - Merchants declare which they accept
- **Payment apps are software**
  - Payment apps implement payment methods
- **Benefits of decoupling data and software**
  - Simplify technical integration for merchants
  - Increase user choice (of software)

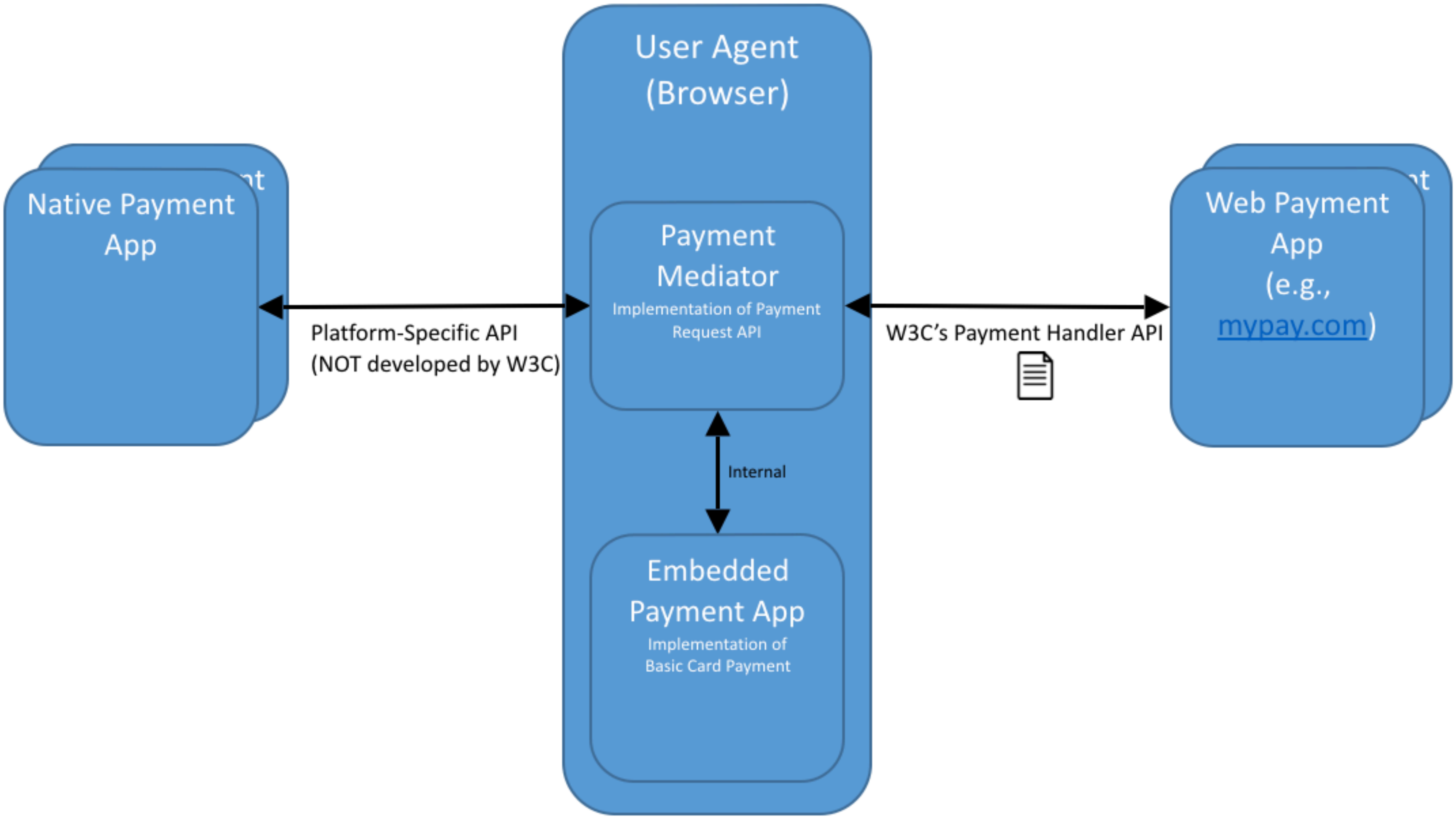
Browser Matches on Payment Methods



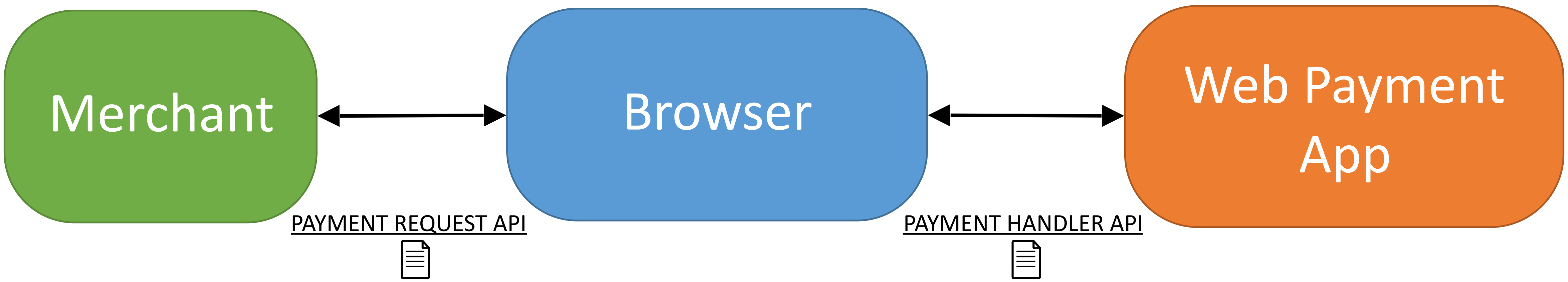
Payment Methods

- Anyone may define one; many will be proprietary
- Identified by Payment Method Identifiers
- W3C is working on three currently:
    - Basic Card Payment
    - Tokenized Card Payment
    - Basic Credit Transfer Payment

3 Kinds of Payment Apps

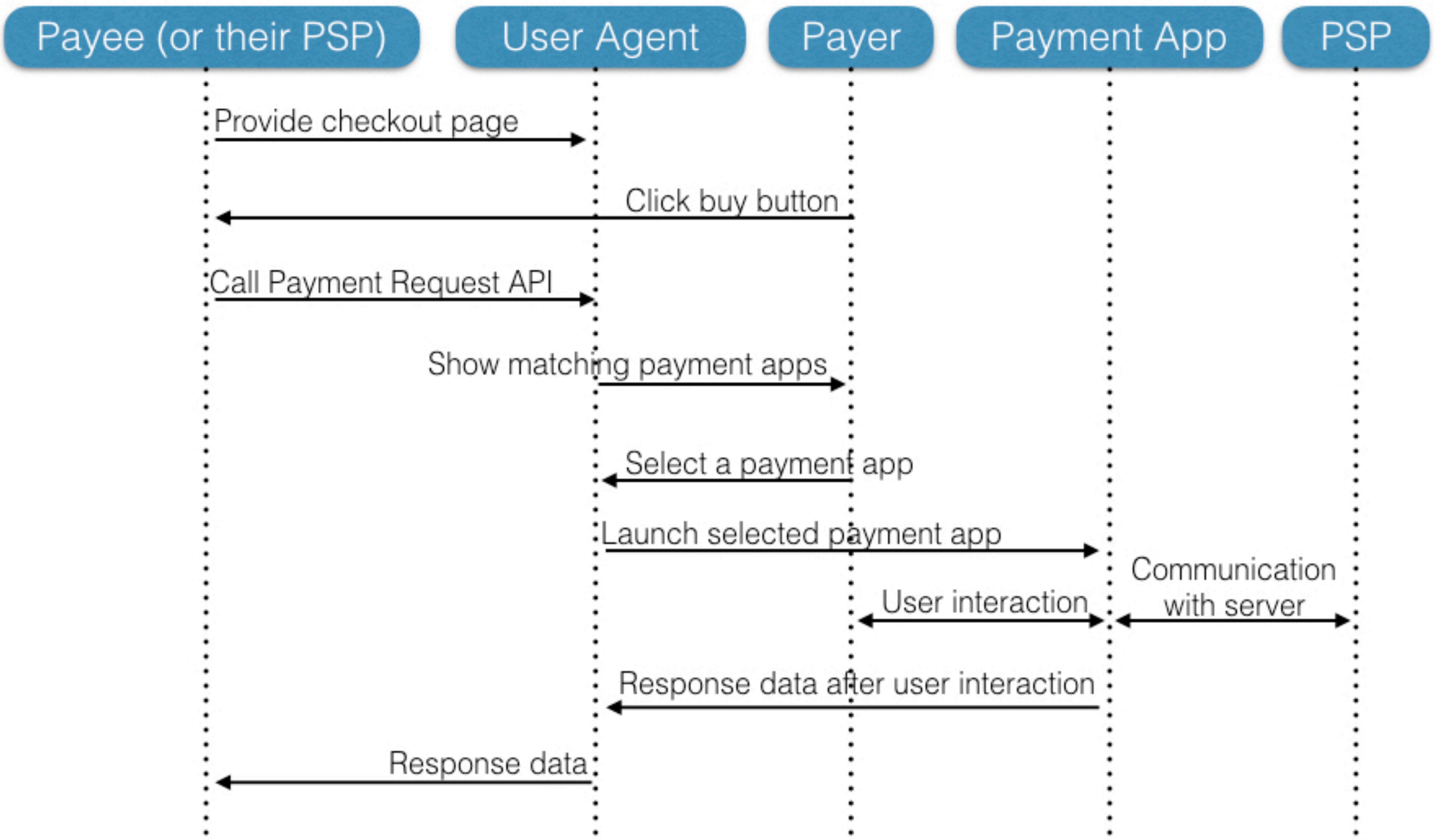


Summary of Roles

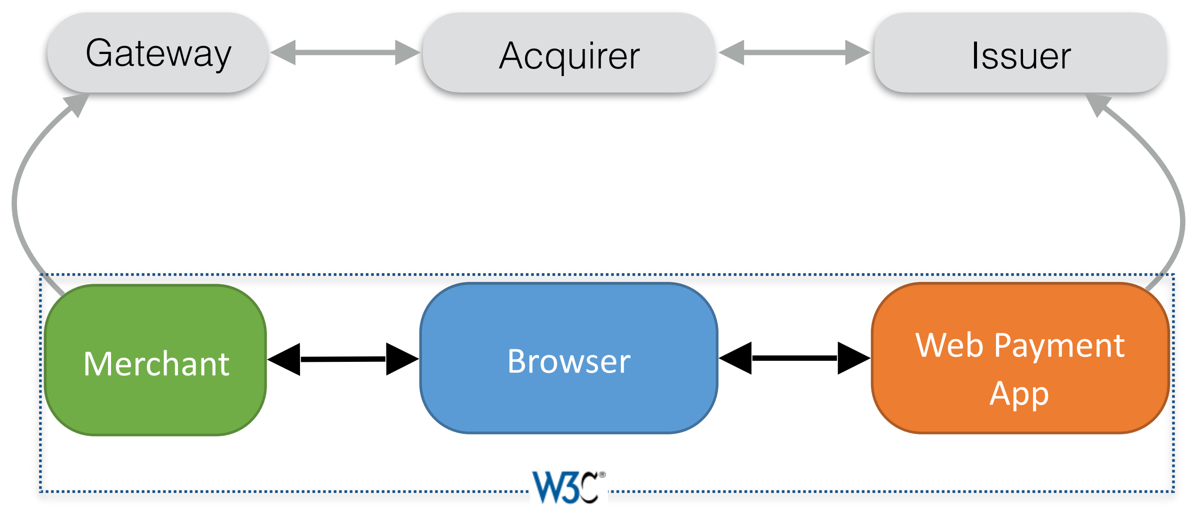


- **Browsers** implement Payment Request API
- **Merchants** call Payment Request API from checkout page
- **Payment Apps** add support for payment methods
- **Users** register payment apps

Transaction Flow



Perspectives on Scope



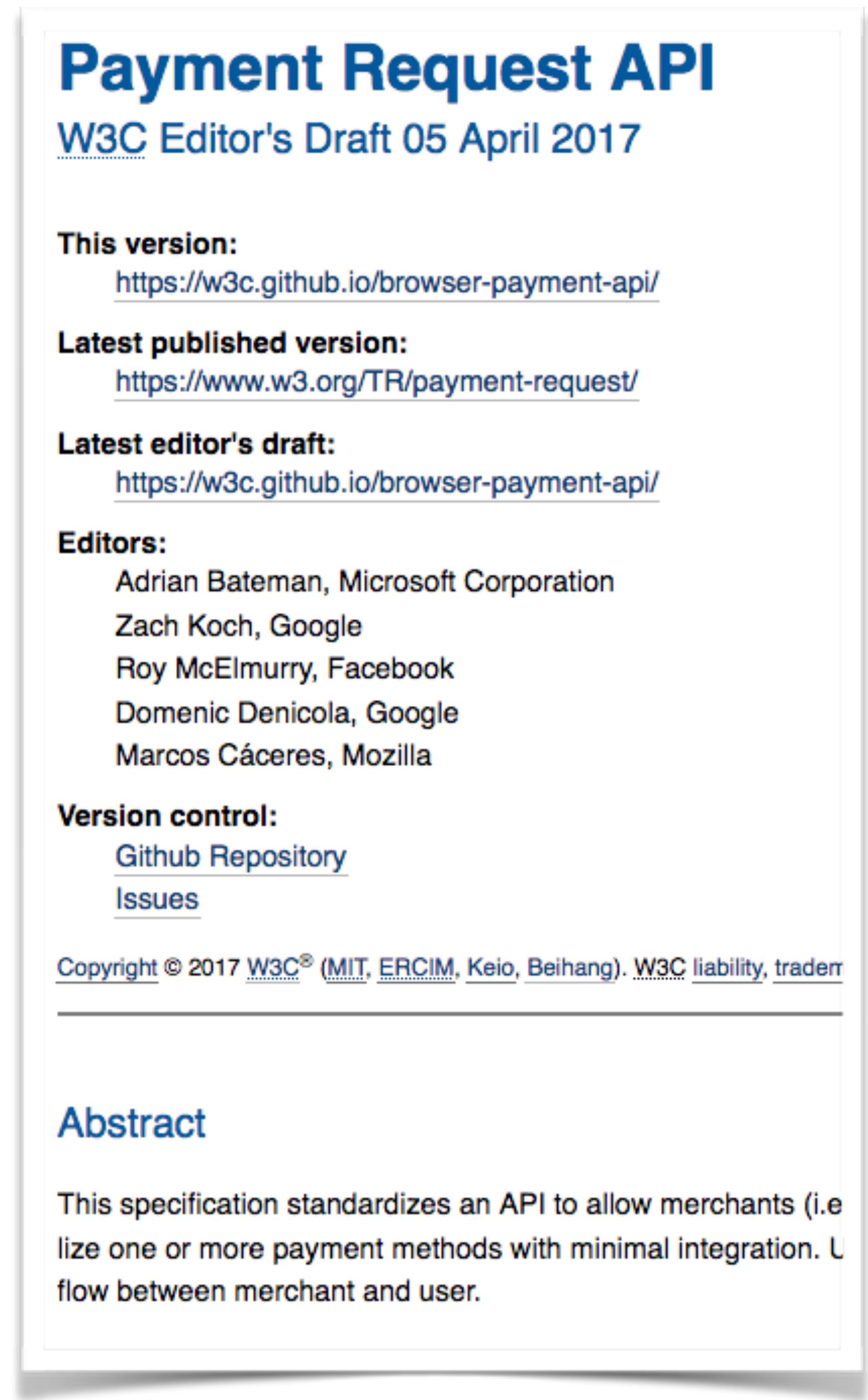
- W3C's Payment APIs (only) address user experience and data exchange.
    - The merchant (or gateway) still needs to manage received data (PAN, token, etc.); we are seeking alignment of our terminology with ISO 20022, SEPA, and others.
    - Payments APIs do not address payment processing and do not affect scheme rules.
    - Payment apps responsible for user relationship with user's payment service provider.
- Other W3C technologies improve Web application security, user authentication, privacy protection.

Who’s Involved

MasterCard
International Forecourt IFSF Standards Forum
unify
telenor
Australian Government Department of Human Services
SAMSUNG
stripe
American Express
Capital One
facebook
db
Alibaba.com
Bloomberg
सी-डैक CDAC
cip Câmara Interbancária de Pagamentos
CANTON-Consulting
中国移动通信 CHINA MOBILE
FSTC
HUAWEI
DeNederlandscheBank EUROSY
United States Federal Reserve System
CTIC Centro Tecnológico
GS1
cdt Center for Democracy & Technology
T · · ·
Standard Treasury
Google
HM Government
IBM
inria
intel
BPCE
MAG Merchant Advisory Group®
mozilla
Microsoft
NACS
inswave Technology and Inspiration
knowbility
ORACLE
LG
Yandex
orange™
nic.br Núcleo de Informação e Coordenação do Ponto BR
SWIFT
VeriSign
ripple
tyfone
PAYGATE
Rakuten
simply
TARGET
360 www.360.cn
Tencent 腾讯
worldpay
VIACOM
the paciello group
airbnb
shopify
ETRI
klarna
SK telecom
gemalto security to be free
SHIFTMobility
deque

Specification Status

- Mature but not finished
    - Payment Request API
    - Payment Method Identifiers
    - Basic Card Payment
- Early Stages
    - Payment Handler API
    - Basic Credit Transfer Payment
    - Tokenized Card Payment
    - Payment Method Manifest



Implementation Status

- Payment Request API
  - Known to be implementing:
    Google, Microsoft, Mozilla, Samsung, Facebook, Opera
  - Mostly mobile implementations today; desktop and others to follow
  - Early adopter sites experimenting
  - Developer guides are appearing
- Payment Apps
  - Known to be experimenting:
    Alipay, Samsung, Google, Amex, Facebook, Worldpay, Stripe, Klarna, Gemalto, Opera, and others
  - Some support for proprietary payment apps in 2017
    (e.g., Chrome)
  - Support for Web-based payment apps to follow

```
function validateResponse(response) {
  // check that the response is ok... throw if
}

async function doPaymentRequest() {
  const payment = new PaymentRequest(methodData
  payment.addEventListener("shippingaddresschar
    // Process shipping address change
  });
  let paymentResponse;
  try {
    paymentResponse = await payment.show();
    // paymentResponse.methodName contains the
    // paymentResponse.details contains a payme
    // response.
    validateResponse(paymentResponse);
    paymentResponse.complete("success");
  } catch (err) {
    console.error("Uh oh, bad payment response!
    paymentResponse.complete("fail");
  }
}
doPaymentRequest();
```

Related Activities at W3C

(standards track, incubation)

Security	Commerce	Backend	Devices	Verticals
Strong Authentication	Digital Offers	Interledger Payments	Devices and Sensors	Automotive
App Security	Digital Receipts	Blockchain	Web NFC, Bluetooth	Internet of Things
Crypto	Paid Content		Virtual Reality	TV / Entertainment
Verifiable Claims			Hardware-Based Secure Services	Digital Publishing

Even more W3C Working Groups and Community Groups...

Thank you!

- These slides: http://www.w3.org/2017/Talks/ij_transactions_201704/w3c.pdf
- Web Payments Working Group
- FAQ
- Regulatory Perspective
- Contact: Ian Jacobs <ij@w3.org>