

The Kraken Effect

JavaScript's Impact on PayPal

Bill Scott

VP Next Gen Commerce @paypal

[@billwscott](#) on [twitter](#)

Fluent Plenary

April 21, 2015

San Francisco





In 2013, I spoke about releasing the “kraken”

What PayPal was like in 2011

180 days to create an app

4-6 week cycles for pushing code

Very long cycles for experimentation

Heavy, centralized framework teams





krakenjs

PayPal *Open Source*

KrakenJS released in 2013

Standard for all PayPal apps

First popular open source framework from PayPal





**The real impact has been from the
introduction of JavaScript and Open Source**

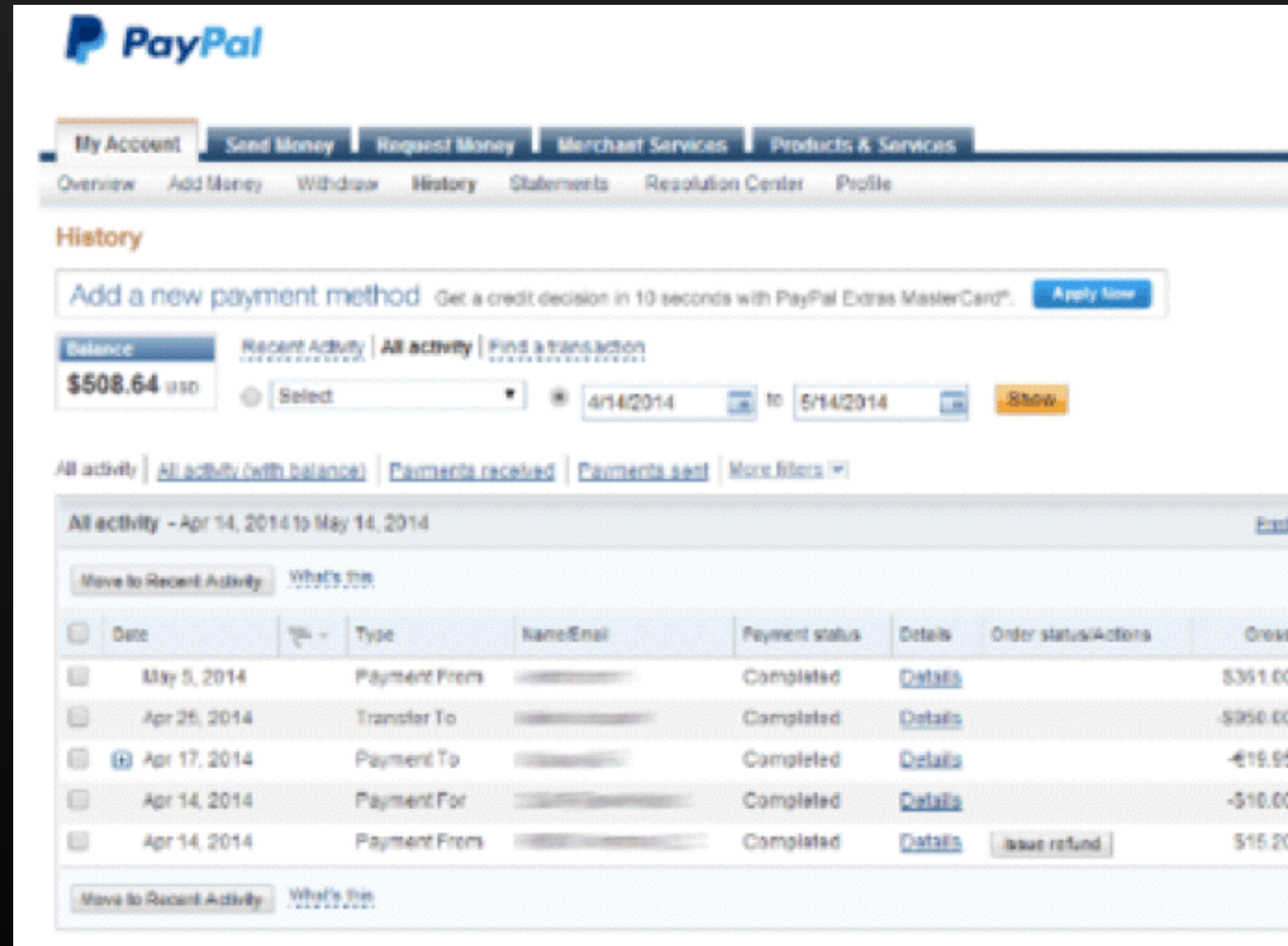
1

Ease of creating apps

It used to take 180 days to get a new app created and put into production!

0

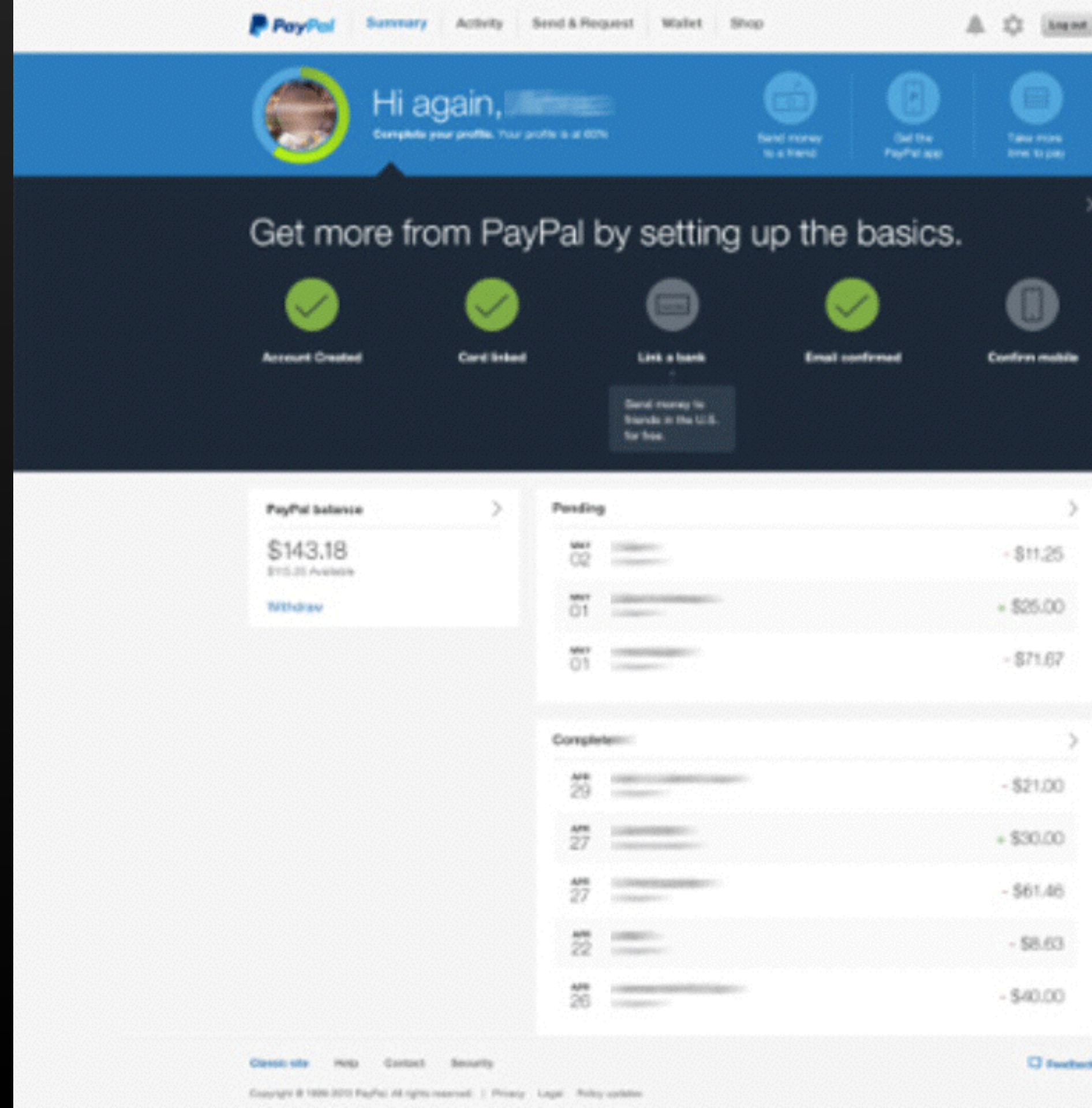
Number of node apps live H1 2013



PayPal experiences prior to NodeJS were primarily very dated in their appearance

Number of node
apps live **H2 2013**

1



67

**Number of node
apps live NOW**

In just 18 months

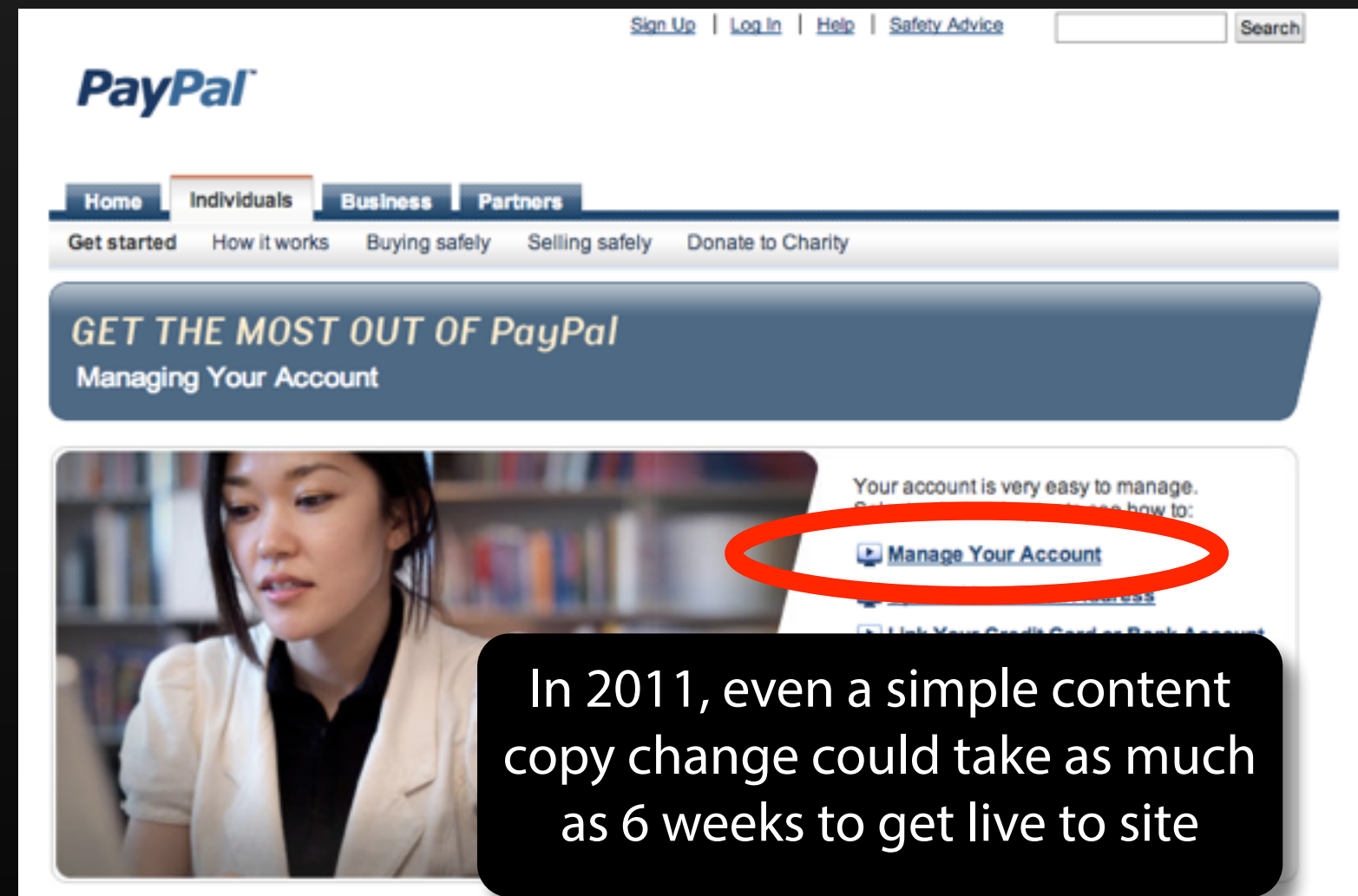
We also trained hundreds of developers in both JavaScript and Node

2 Velocity of pushing code

From weeks to minutes

6

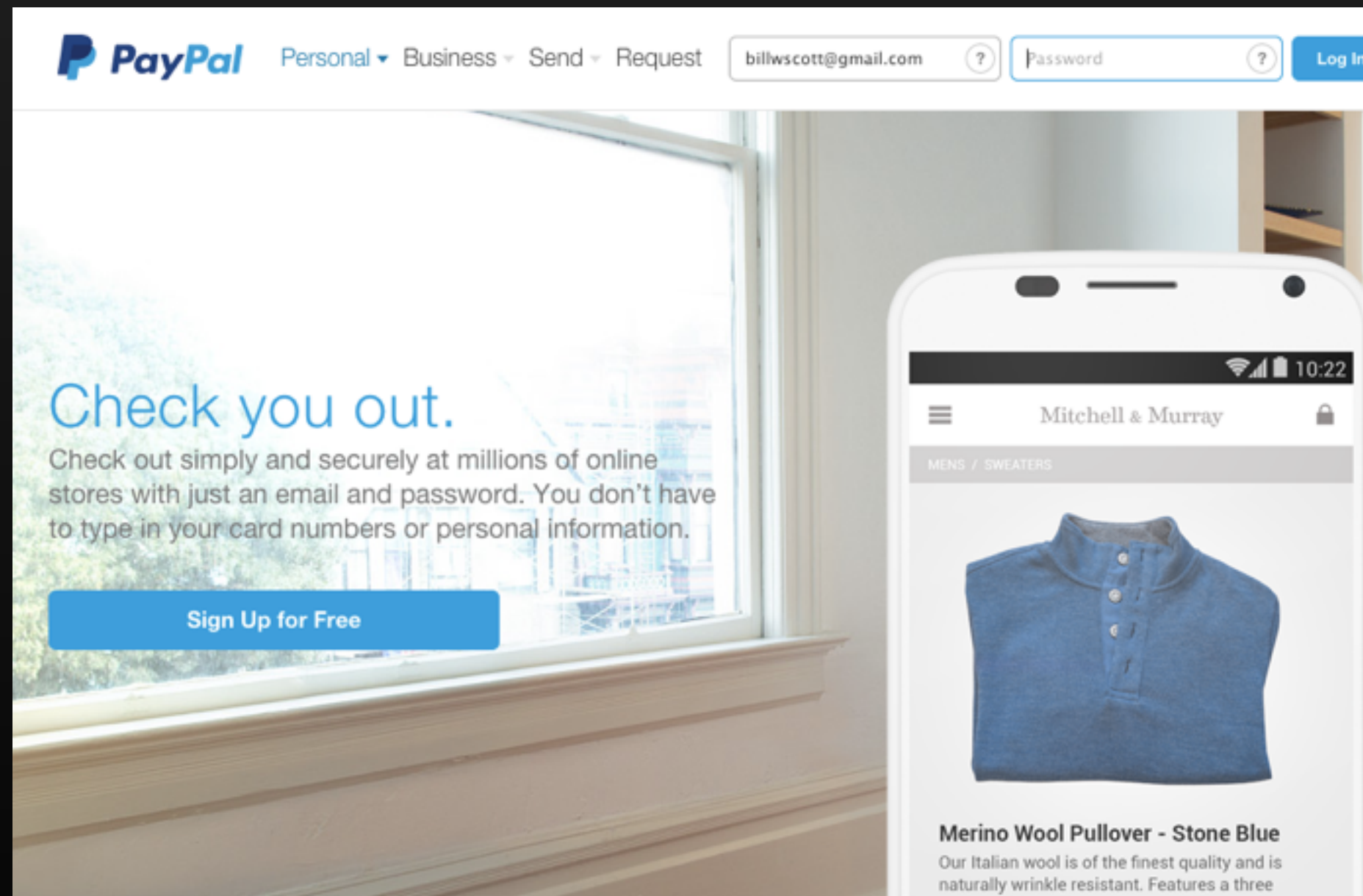
2011: 6 weeks for
a content change



PayPal experiences prior to NodeJS were primarily very dated in their appearance

<1

2013: 1 **minute** for
a content change



PayPal marketing pages run on a NodeJS content management system using github as the repository for its content



2

**months to change
header/footer**

The screenshot shows the PayPal dashboard with a top navigation bar containing links for Money, Transactions, Customers, Tools, and More. The main content area is divided into two columns. The left column has a 'Money' section showing an available balance of \$8.03* and a list of currencies (USD, GBP, HKD) with their respective exchange rates. Below this is a 'Tools' section with icons for PayPal Here, Request Money, and Send Money. The right column has a 'Transactions' section with a list of recent transactions, including payments received and sent, and reversals.

Money	
Available	\$8.03*
USD	\$6.94
GBP	£0.27
HKD	\$2.71
3 more currencies	
* This is an estimate based on the most recent conversion rate.	
Withdraw Money • Add Money • Currencies	

Transactions	
Feb 10, 2015	PayPal services To US Postal Service Completed
Feb 7, 2015	Reversal From US Postal Service Completed
Feb 5, 2015	Payment From Sri business test Completed
Feb 5, 2015	PayPal services To US Postal Service Completed
Feb 2, 2015	Payment From HSSUK20Aug2011 Completed
Jan 31, 2015	Fee reversal From PayPal Completed

Because of dependencies on classic monolithic CGI PayPal app, it could take 2 months to change header



2

**minutes to change
header/footer**

The screenshot displays the PayPal dashboard with a top navigation bar containing links for Money, Transactions, Customers, Tools, and More. The main content area is divided into two columns. The left column features a 'Money' section with an 'Available' balance of \$8.03 and a list of currencies (USD, GBP, HKD) with their respective exchange rates. Below this is a 'Tools' section with icons for 'PayPal Here', 'Request Money', and 'Send Money'. The right column features a 'Transactions' section with a list of recent transactions, including payments received and sent, and reversals.

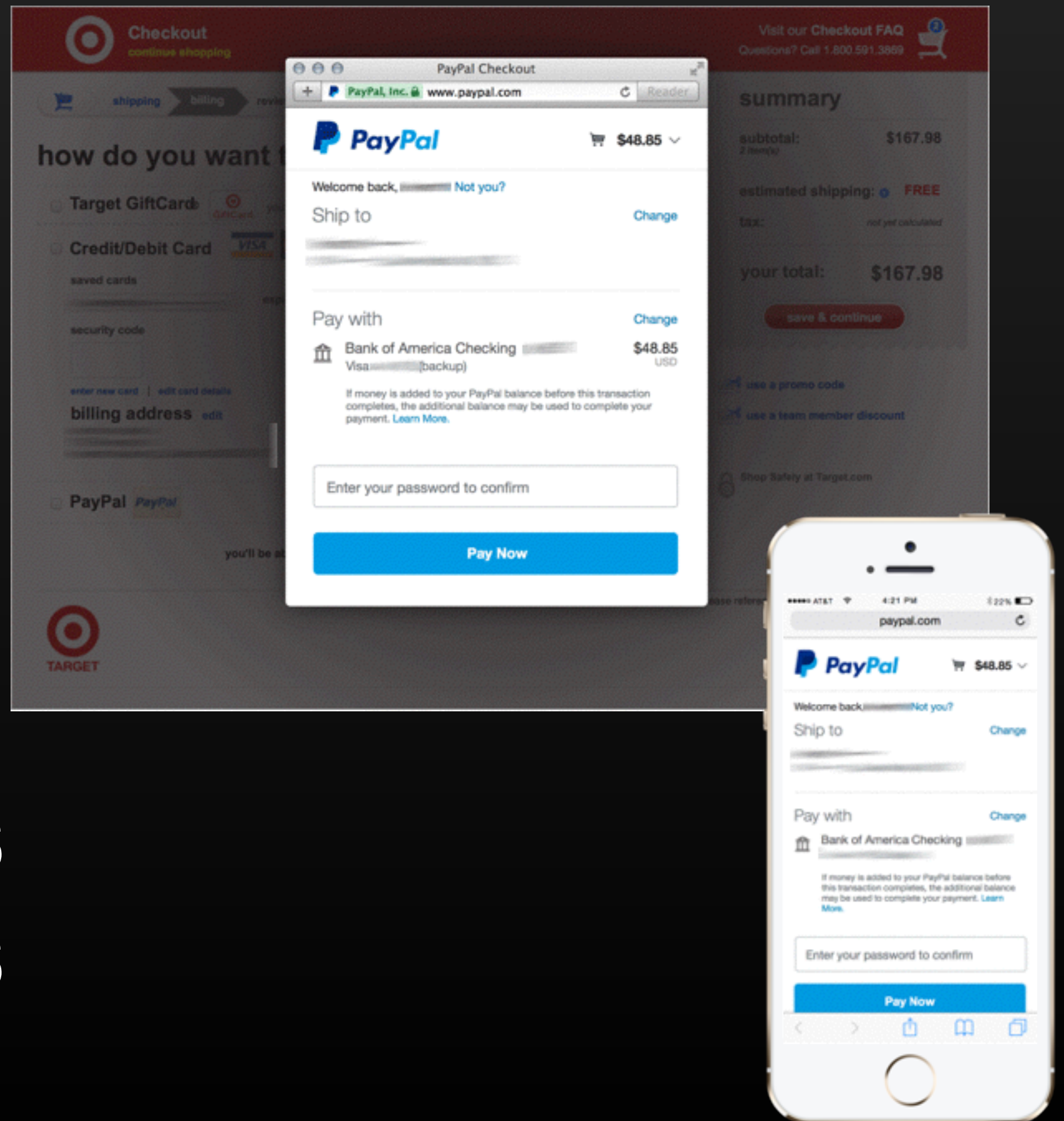
Transaction Date	Transaction Description	Status
Feb 10, 2015	PayPal services To US Postal Service	Completed
Feb 7, 2015	Reversal From US Postal Service	Completed
Feb 5, 2015	Payment From Sri business test	Completed
Feb 5, 2015	PayPal services To US Postal Service	Completed
Feb 2, 2015	Payment From HSSUK20Aug2011	Completed
Jan 31, 2015	Fee reversal From PayPal	Completed

Because of dependencies on classic monolithic CGI PayPal app, it could take 2 months to change header

300

300 live code pushes in a few months

Checkout requires deep analytics as just a few basis
points change in conversion is significant



3

Experimentation mindset

JS & OS leads to shift-refresh and quickly adding new software

**The UI Layer is the
Experimentation Layer**

a tale of two trains



departs infrequently

“gotta get on the train or I will have to wait a long time”



departs all the time

“if I miss this train another one comes in a few minutes”

Existing stack wasn't good for rapid prototyping

prototyping
was hard

Proprietary JAVA
centric UI FW

Optimized for the Java developer,
not the front end application
developer

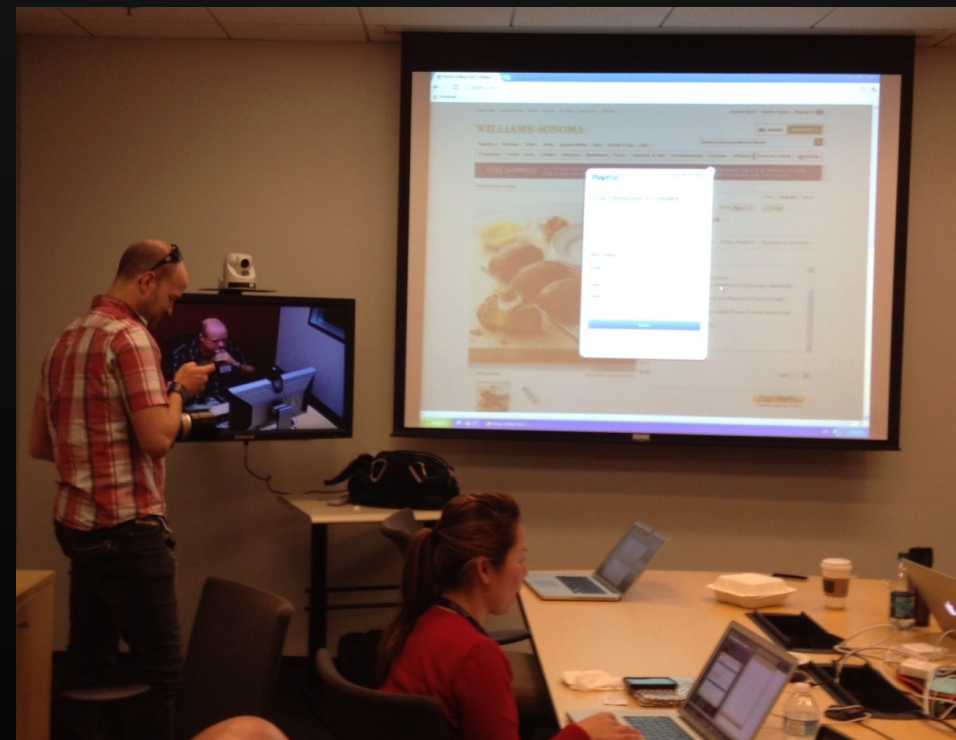
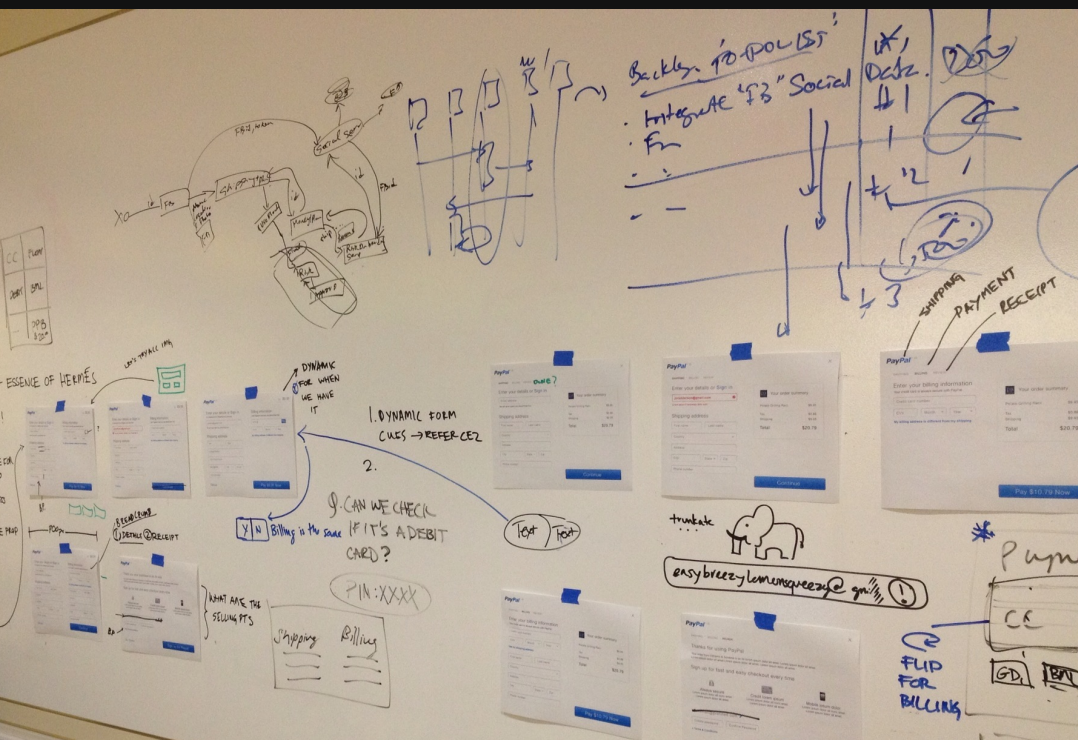
“ui bits” mostly
lived here

JSP

Needed Java developers to make
the UI work

Java
Components

NodeJS for prototyping



The shift-refresh nature of Node development works well for LeanUX

before

My Volusion Store

Your order summary

Descriptions	Amount
Order Sub-Total	\$60.00
Item price: \$60.00	
Quantity: 1	
Item total	\$60.00
Tax	\$7.80
Shipping and handling:	\$12.71
Total \$80.51 USD	

Review your information



Continue

Shipping address [Change](#)

Valued Customer
123 Street Dr.
City, ST 12345
United States

Note to seller: [Add](#)

Payment methods [Change](#)

Instant Transfer : Chase Manhattan Checking (Confirmed) x-2458 \$80.51 USD

PayPal will use MasterCard XXXX-XXXX-XXXX-4472 to fund this transaction if your bank does not have enough funds.

☐ PayPal gift card, certificate, reward, or other discount [Redeem](#)
View [PayPal policies](#) and your payment method rights.

Contact information

valued_customer@mail.com

Continue

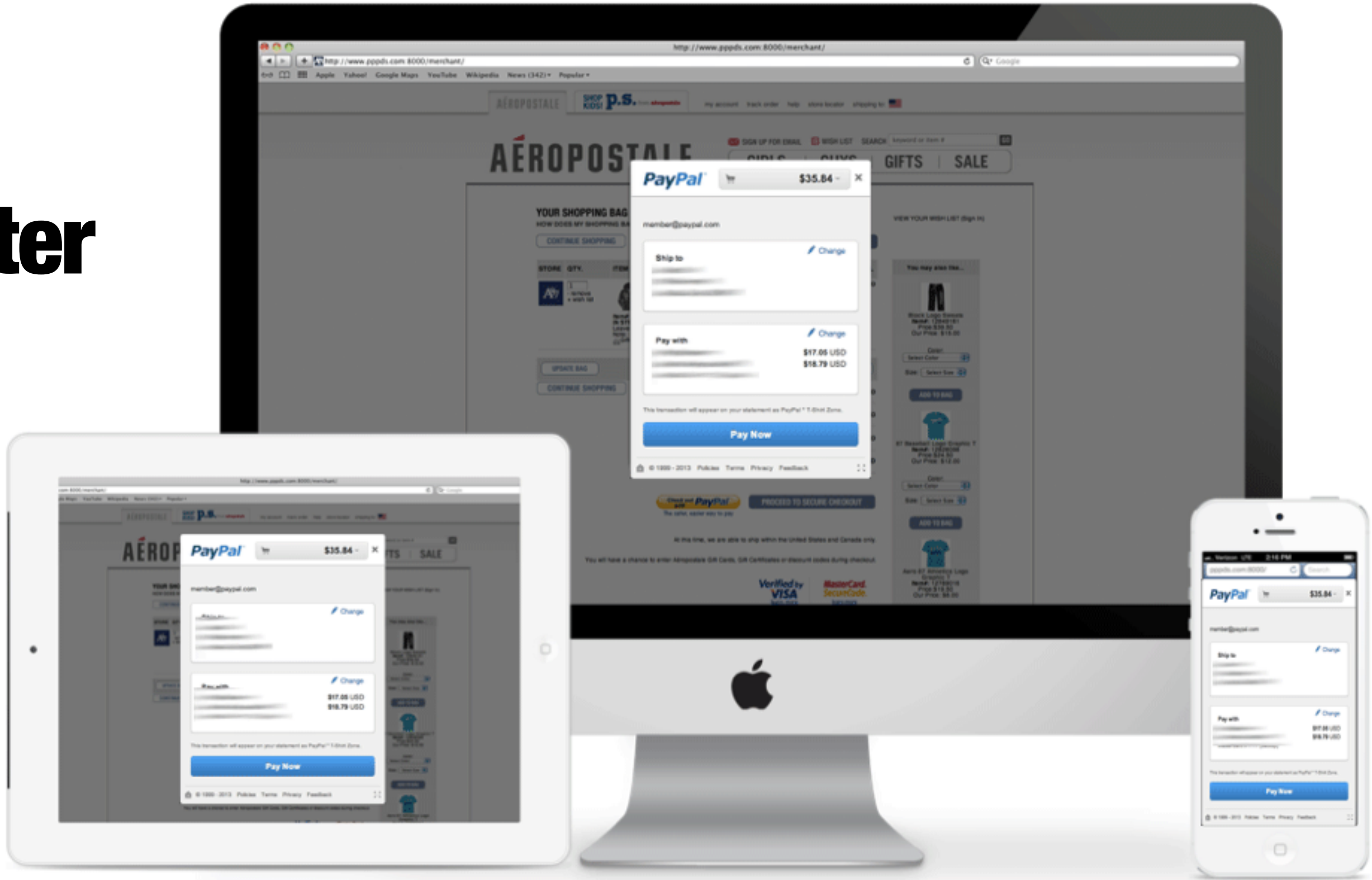
You're almost done. You will confirm your payment on My Volusion Store.

[Cancel and return to My Volusion Store.](#)

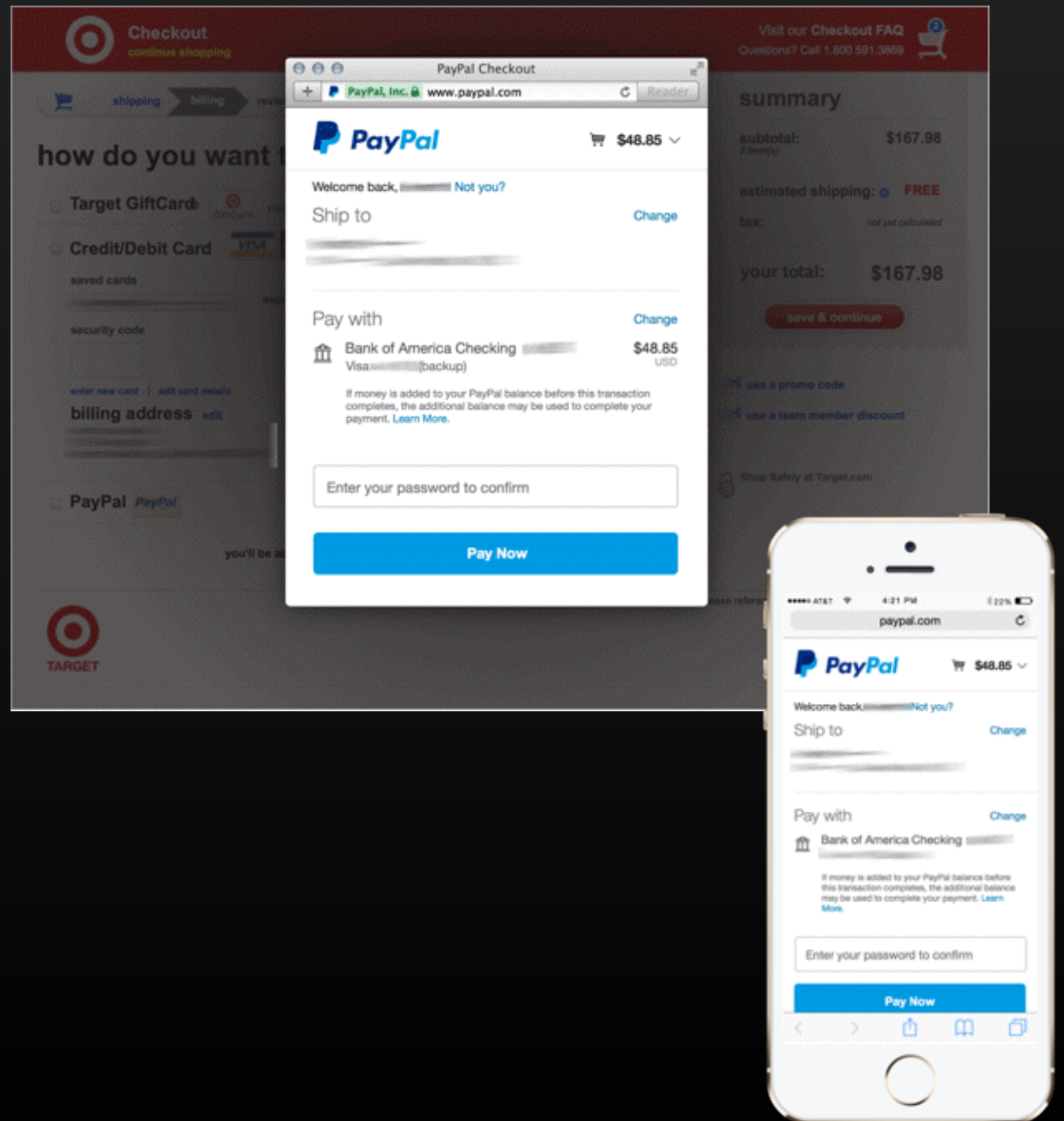
[Site Feedback](#) (*)

PayPal. The safer, easier way to pay. For more information, read our [User Agreement](#) and [Privacy Policy](#).

after



First PayPal app in AngularJS



dustjs, angular, ember, react, react native

nodejs as apps, nodejs as services

4

Democratize the code

Deliver us from evil centralized, bloated frameworks and deliver the open source to our souls



<3 Github

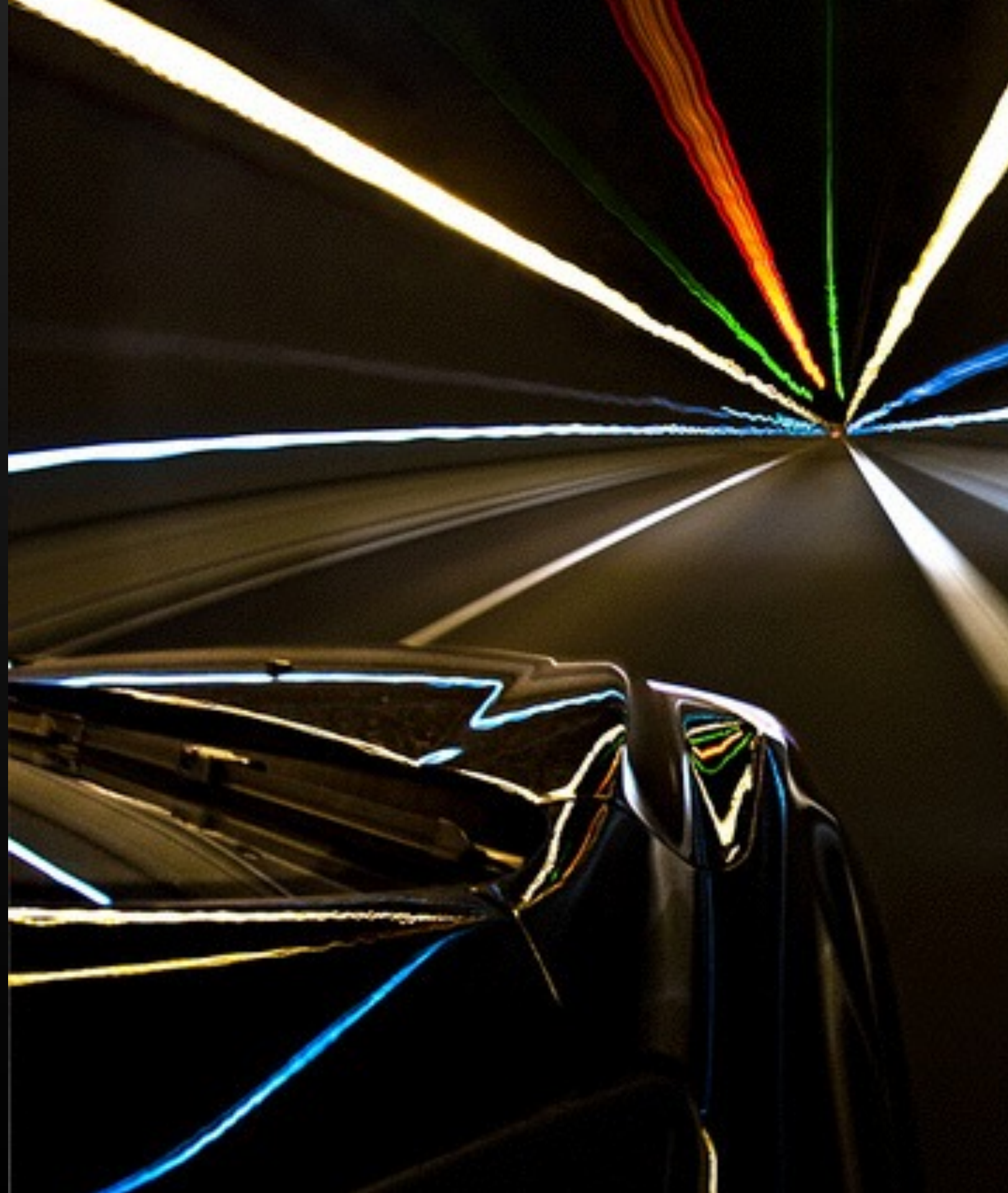
What PayPal is like now after the impact of JS & OS

Simpler to create apps

Code velocity is higher

Experimentation is enabled

Frameworks/product code is democratized





picture credits

<http://www.flickr.com/photos/kowani/5565778790/>

<http://www.flickr.com/photos/ahockley/2657296577/>

<https://www.flickr.com/photos/elycefeliz/5000964458/>

<https://www.flickr.com/photos/alwarrete/5651579563/>

<http://www.flickr.com/photos/stuckincustoms/2380543038/>

follow me on twitter
@billwscott