John Davies
CTO

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Inside Visa

QCon - San Francisco
16th November 2011

Agenda

- What does Visa do?

- Some impressive numbers

- Changes to the Payments industry

- How Development in Visa has changed

- Where we are now
  - Agile Methodologies
  - The Technology Stack

- What we're developing
  - Developer's Centre
  - Developer's APIs

Let's get on with it...

- You are developers, I hope to do two things for you...
  - Provide you with some information about how Visa, as a large organisation, has made significant changes in the way they develop new products
  - Provide you with some information about some new APIs

- I hope you will help Visa with the following...
  - Provide early feedback on the new APIs
  - See Visa in a different light, yesterday just another large corporation, today an exciting place to work

- Let's see how we get on...

Visa Inc.

- Visa is a Payments Processor
  - "A Global Payments Technology Company"

- HQ is in Foster City (just south of the Airport)

- Visa Inc and Visa Europe are separate, independently operating companies
  - Visa Inc shifted from association to public company in 2008

- ~~Not a "credit card company"~~

- ~~Not an issuer~~

- ~~Not a bank or lender~~

Visa's Role in the Payments Network

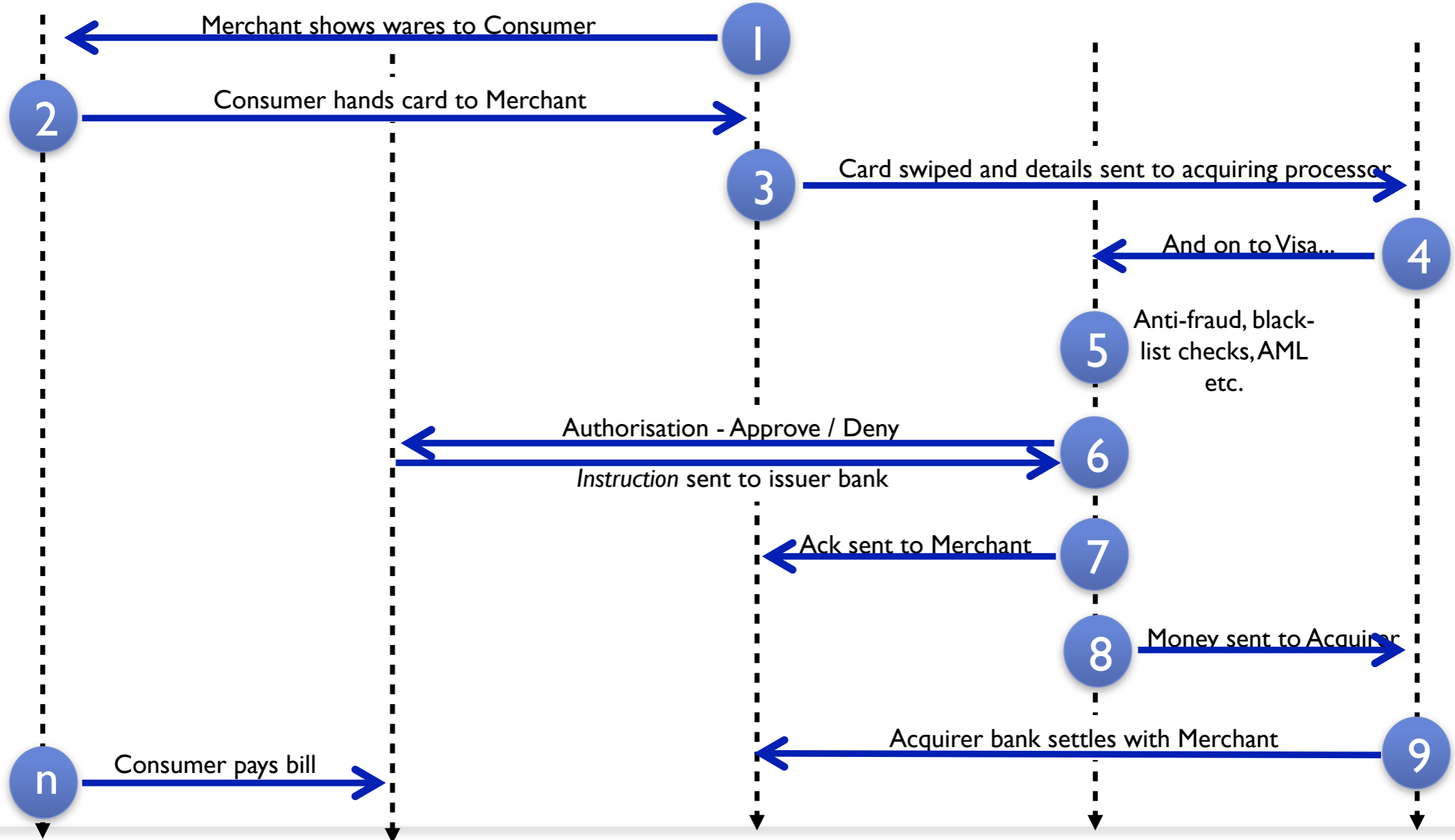| Cardholders	Merchant	Acquirer	Network	Issuing Banks
• Individuals and businesses that conduct transactions to pay for goods and services	• Retailers, billers and others who accept cards as a method of payment for their goods or services	• Signs up retailers • Manages authorisation, capture and settlement • Generates recurring reports/ statements • Provides customer service for retailers	• Provides processing and operational systems • Develops products • Provides risk management • Builds and manages global brand • Develops new marketplace opportunities and promotes acceptance	• Issue cards • Assume cardholders' credit risk • Set and collect card fees and interest rates • Provide customer service for consumers

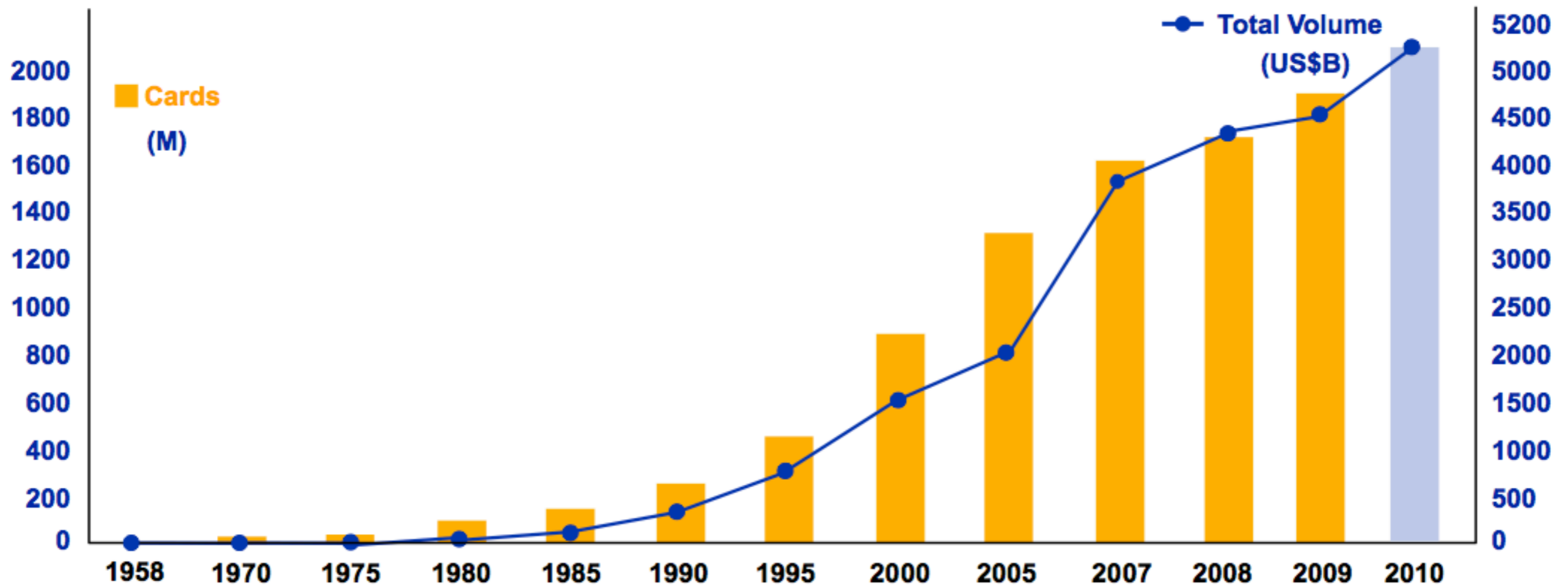Consumer   Issuer   Merchant   Acquirer Processor

1. Merchant shows wares to Consumer
2. Consumer hands card to Merchant
3. Card swiped and details sent to acquiring processor
4. And on to Visa...
5. Anti-fraud, black-list checks, AML etc.
6. Authorisation - Approve / Deny
   Instruction sent to issuer bank
7. Ack sent to Merchant
8. Money sent to Acquirer
9. Acquirer bank settles with Merchant
n. Consumer pays bill

The numbers are impressive...

- 16,000 financial institution partners

- Over 100 billion transactions per year
  - Over 270 million per day - 11 million per hour - >3,000 per second
  - Peeks are around 24,000 per second, 86 million per hour
    - Apparently PayPal can manage 150 per second

- All in a few hundred milliseconds (at most)

- Over $5 trillion in total global volume
  - Over $13.7b per day - $570m per hour - $158k per second

- 30 million global merchants

- Accepted in 1.4 million ATMs

- 1.87 billion cards (in 2009, more now)

Source...
- http://phx.corporate-ir.net/External.File?
  item=UGFyZW50SUQ9NDYxMzZ8Q2hpbGRJRD0t
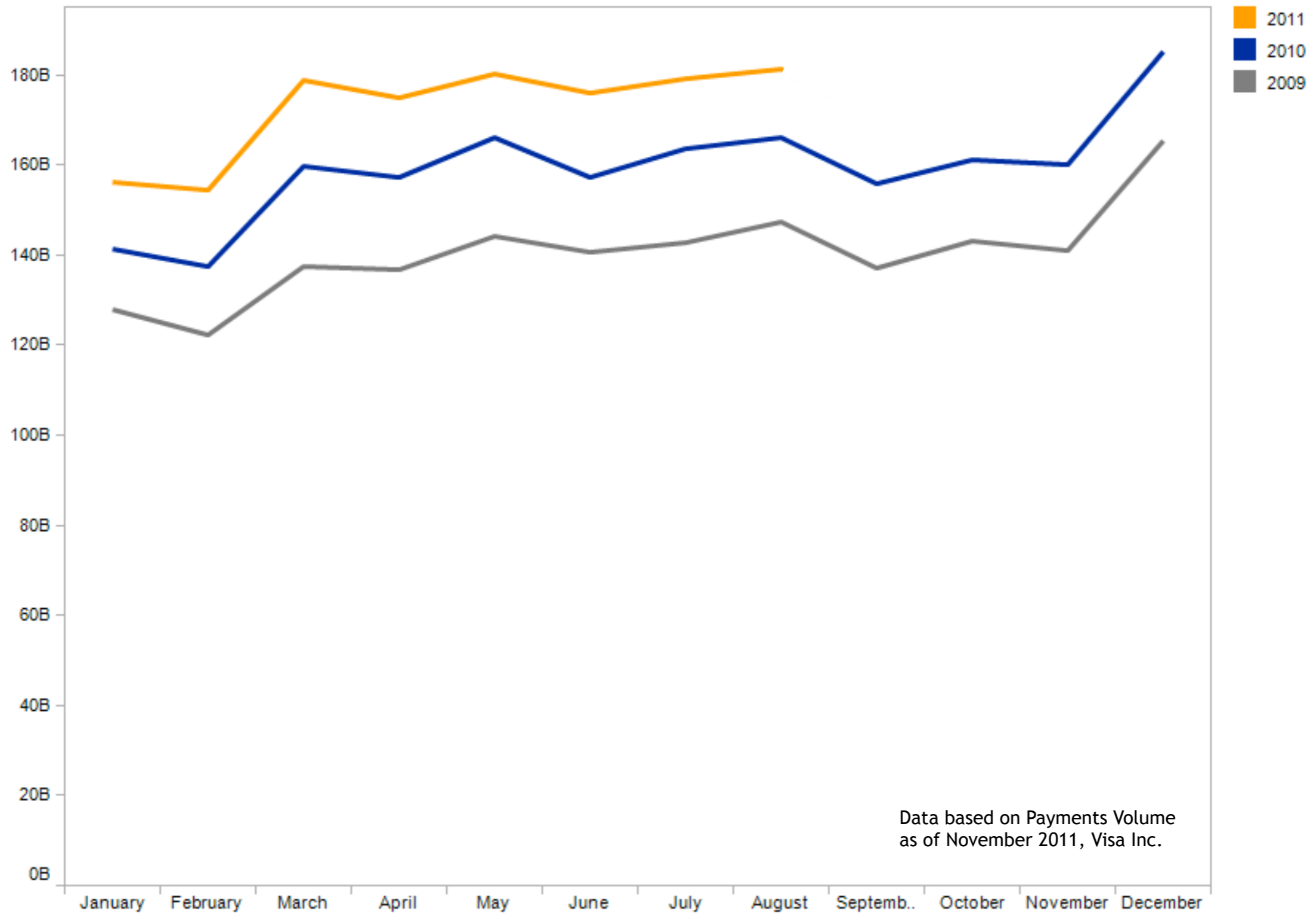 MXxUeXBlPTM=&t=1
- Visa's Mars system

Graphically

- Numbers of cards (bars & left-hand scale in millions)
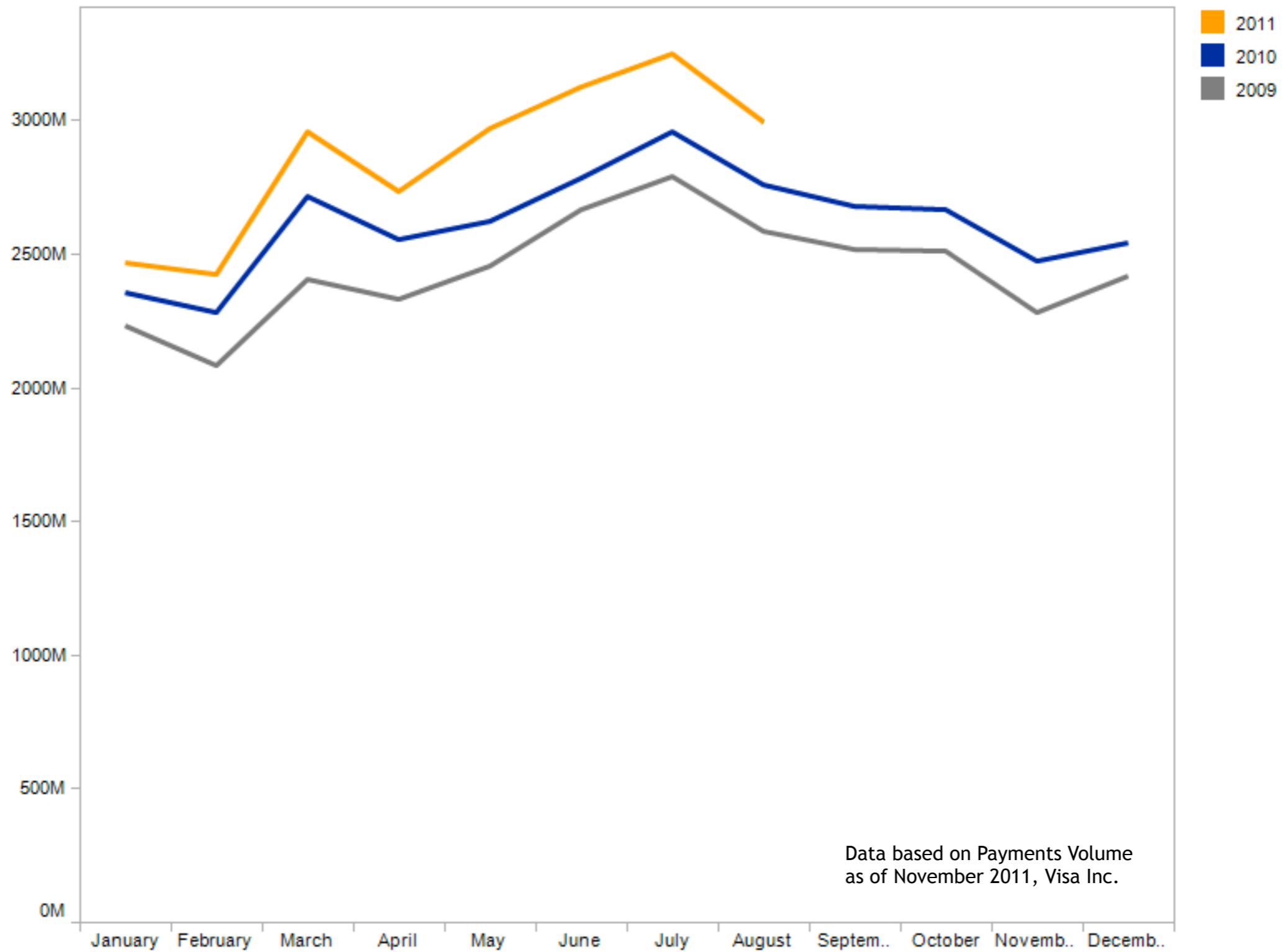- Volume of business (points & right-hand scale in US$ billions)
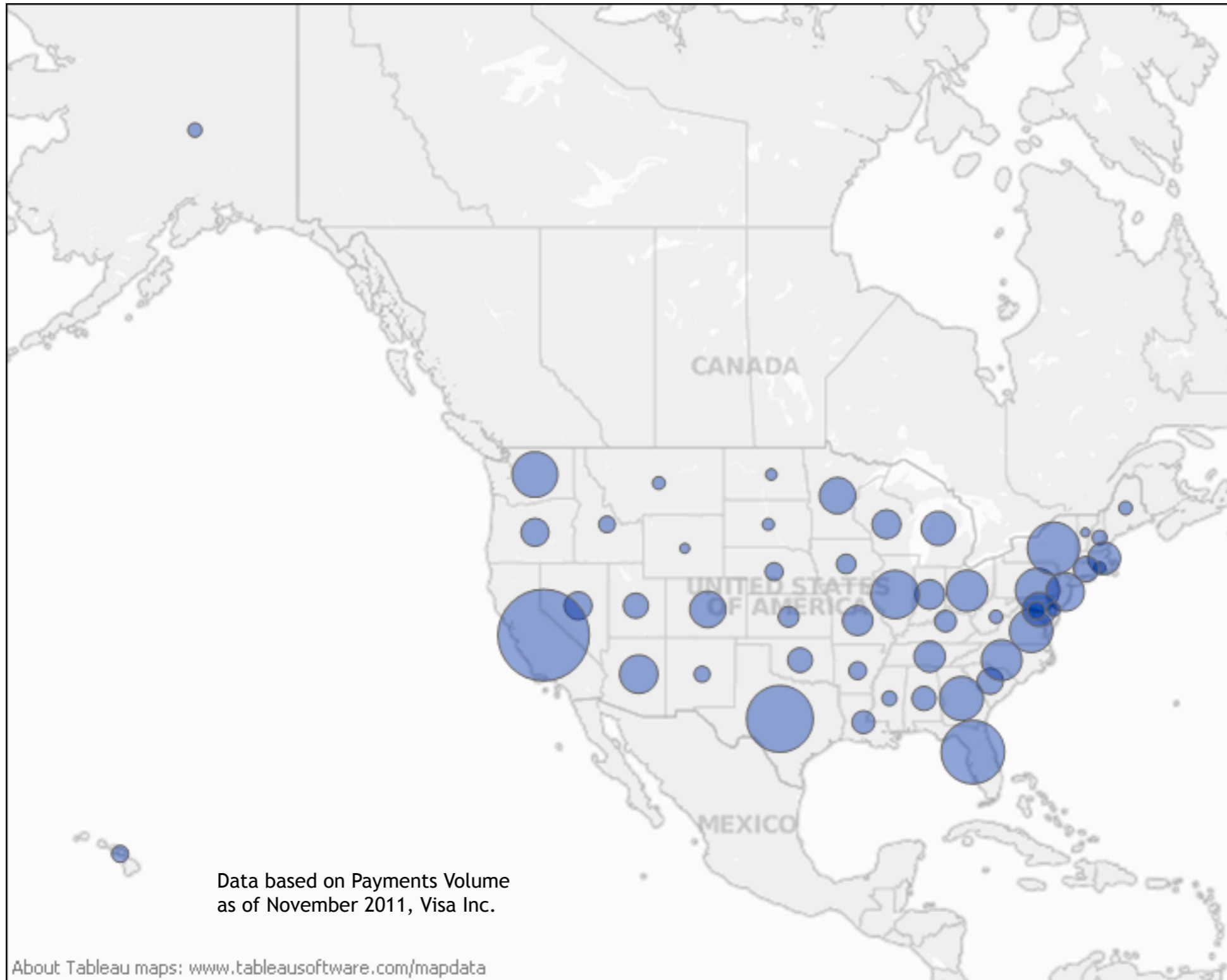

Source: Visa Quarterly Briefing - Aug 2011
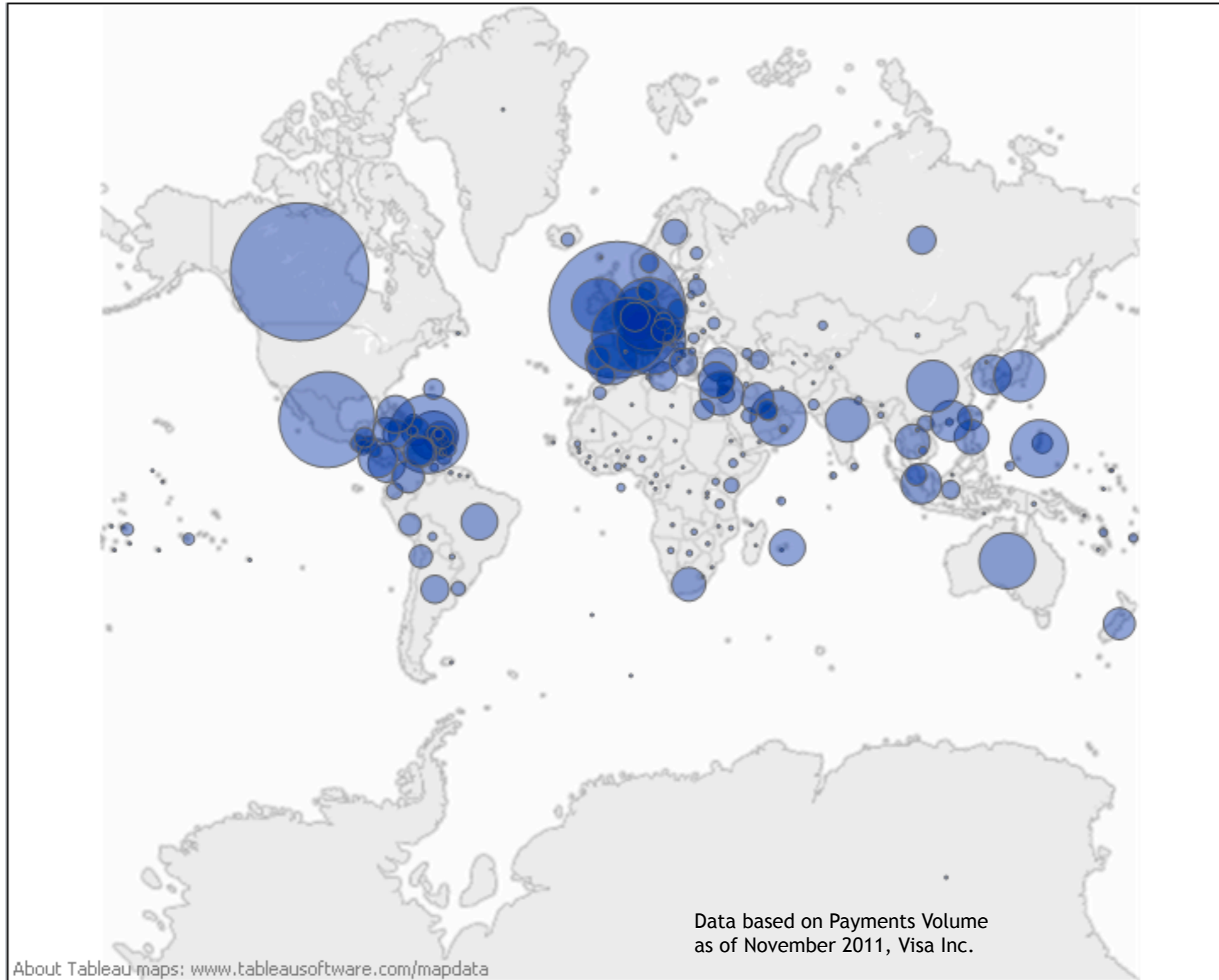
Non-US Sales "Drafts" by Month

Data based on Payments Volume
as of November 2011, Visa Inc.

US Sales "Drafts" by State 2010

Data based on Payments Volume
as of November 2011, Visa Inc.

About Tableau maps: www.tableausoftware.com/mapdata

Size Legend

·	2,000,000,000
	100,000,000,000
	200,000,000,000
	300,000,000,000

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Non-US Sales "Drafts" by Country

Data based on Payments Volume
as of November 2011, Visa Inc.

About Tableau maps: www.tableausoftware.com/mapdata

Size Legend

|	
·	100
	1,000,000,000
	2,000,000,000
	3,000,000,000
	≥ 4,000,000,000
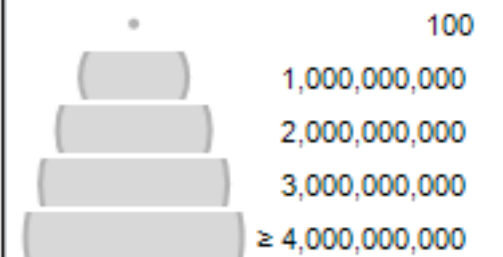
Let's look at how development has changed in Visa

My Own Free Will

- Visa is a QCon event sponsor but I'm speaking for myself - my own free will :-)

- It's unusual to be able to speak about a large corporation
  - Even more unusual as an external

- When I started working with Visa in 2006 is was just like all the other places I'd worked - mostly banks
  - JP Morgan, BNP Paribas etc.

- Financial organisations are heavy on security, projects take years and it's all waterfall - Frozen Niagara!!!
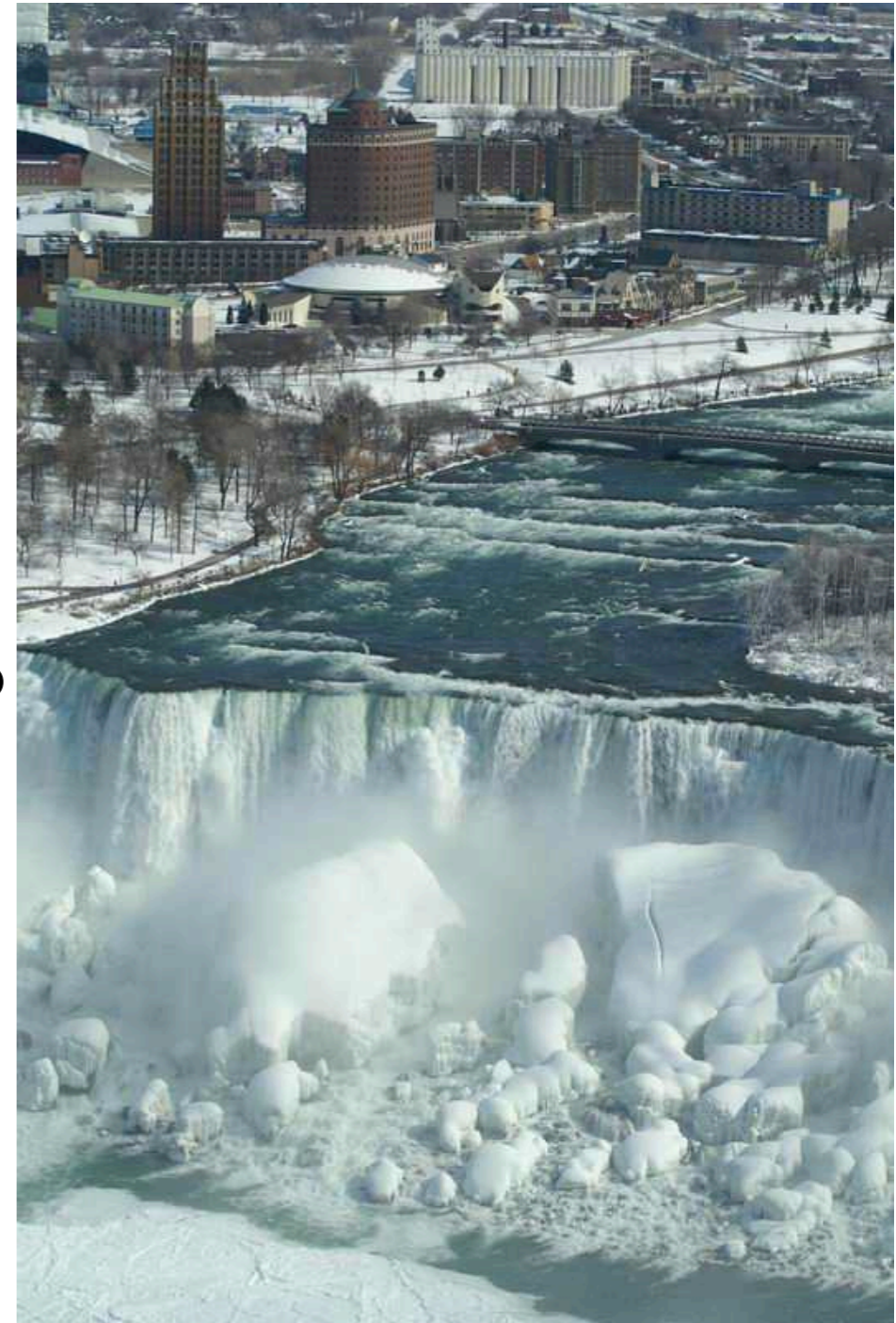
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Visa is Agile

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How We Got Here (Tips)

- Get Strong Sponsorship
  - Initiated by the product strategy team at the start of the effort
  - Supported by executive team

- Establish new mental models
  - From "Learn by planning" To "Learn by doing"

- Give each group the destination they are ready for
  - The destination can be different for each, and evolve over time
  - Risk, Legal, etc will each have their own "reasonable next step"
  - Apply and evolve the frameworks to help everyone keep/catch up

- Support the transformation
  - Agile Coaches
  - Training
  - Books

Example: Discovery Curve

Where does most of the learning happen?
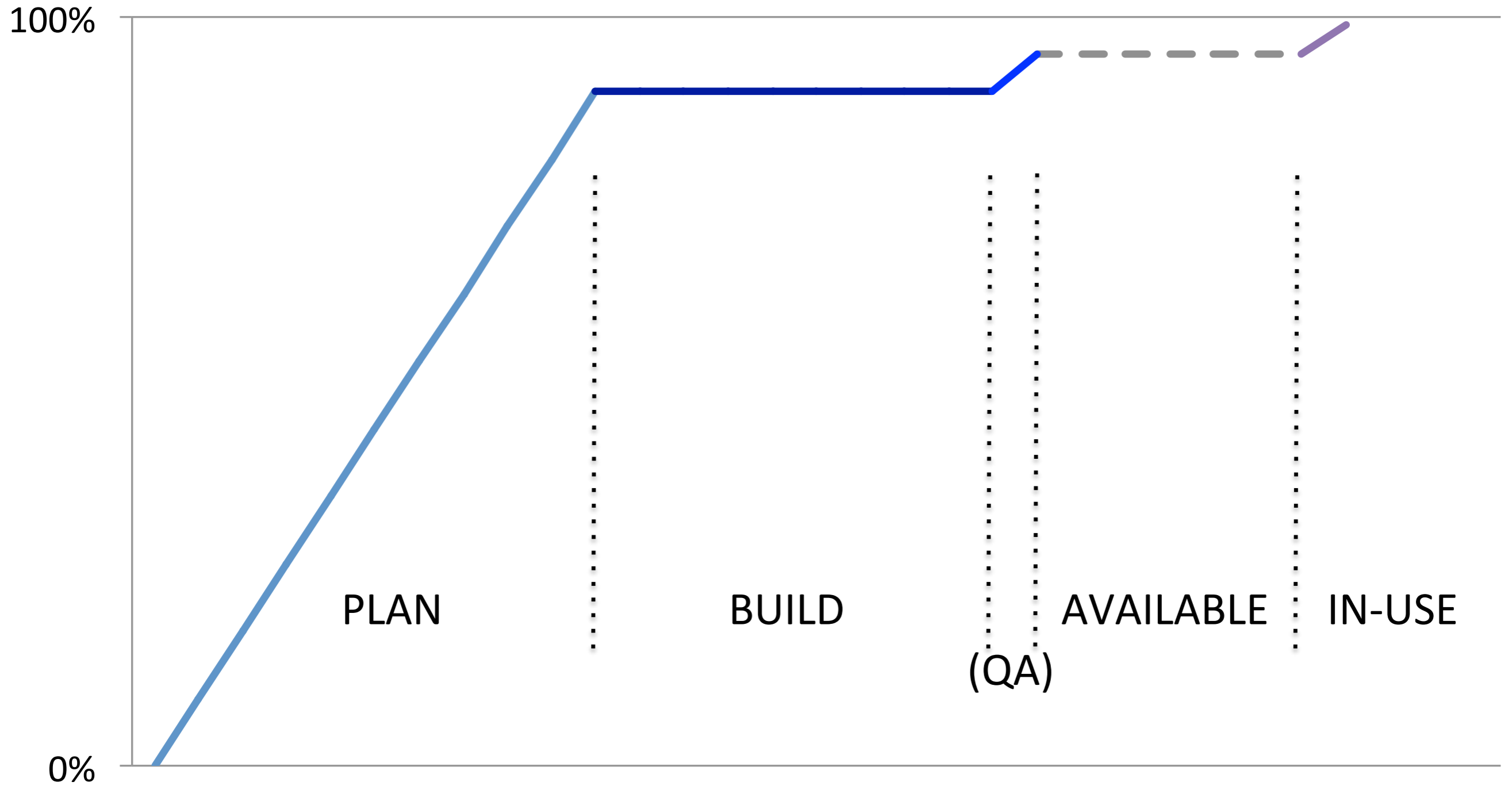
- Today's booming industries...
  - Mobile (Apple, Google, ISIS, ~~Nokia~~, ~~Blackberry~~ etc.)
  - Social Media (FaceBook, Twitter etc.)
  - Payments / Shopping (Amazon, Google, Square, PayPal etc.)
  - Offers & Loyalty

- There is strong competition and convergence towards social and mobile-driven payments

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Obligatory Acronyms

- MDA (Model Driven Architecture)

- TDD (Test Driven Development)

- BDD (Behaviour Driven Development)

- Agile
    - MVP (Minimum Viable Product)
    - MTP (Minimum Testable Product)
    - MMF (Minimum Marketable Feature)

- CI (Continuous Integration)

- SCRUM

- XP (eXtreme Programming)

Languages

- **Languages**
    - Java
    - Ruby (on Rails)
    - Others such as Python

- **Spring**
    - Spring Integration
    - Spring Batch
    - Spring Data
    - Spring Roo
    - Spring Beans
    - Spring MVC

IDEs, APIs and Interfaces

- IDEs
  - IntelliJ
  - Eclipse (& STS)
  - RubyMine

- APIs and interfaces
  - REST, JSON & SOAP
  - AJAX
  - HTML 5

Testing and Code Coverage

- Testing
  - Selenium - TDD
  - Cucumber - BDD
  - JUnit
  - SoapUI

- Code coverage & QA
  - Mockito - Mocking
  - Sonar - Code Quality
  - Emma - Code Coverage
  - Crucible - Code Reviews

Persistence, Containers & Tools

- **Persistence**
  - JPA / Hibernate
  - GemFire
  - Oracle

- **Containers**
  - TC Server (Tomcat)
  - VMWare VBlock

- **Tools**
  - Confluence - Wiki
  - Jira - Issue tracking & Story/Task management

- **Binding and Mapping**
  - C24
  - Dozer - Bean mapping
  - JAXB
  - XML Schema

- **Building / Deployment**
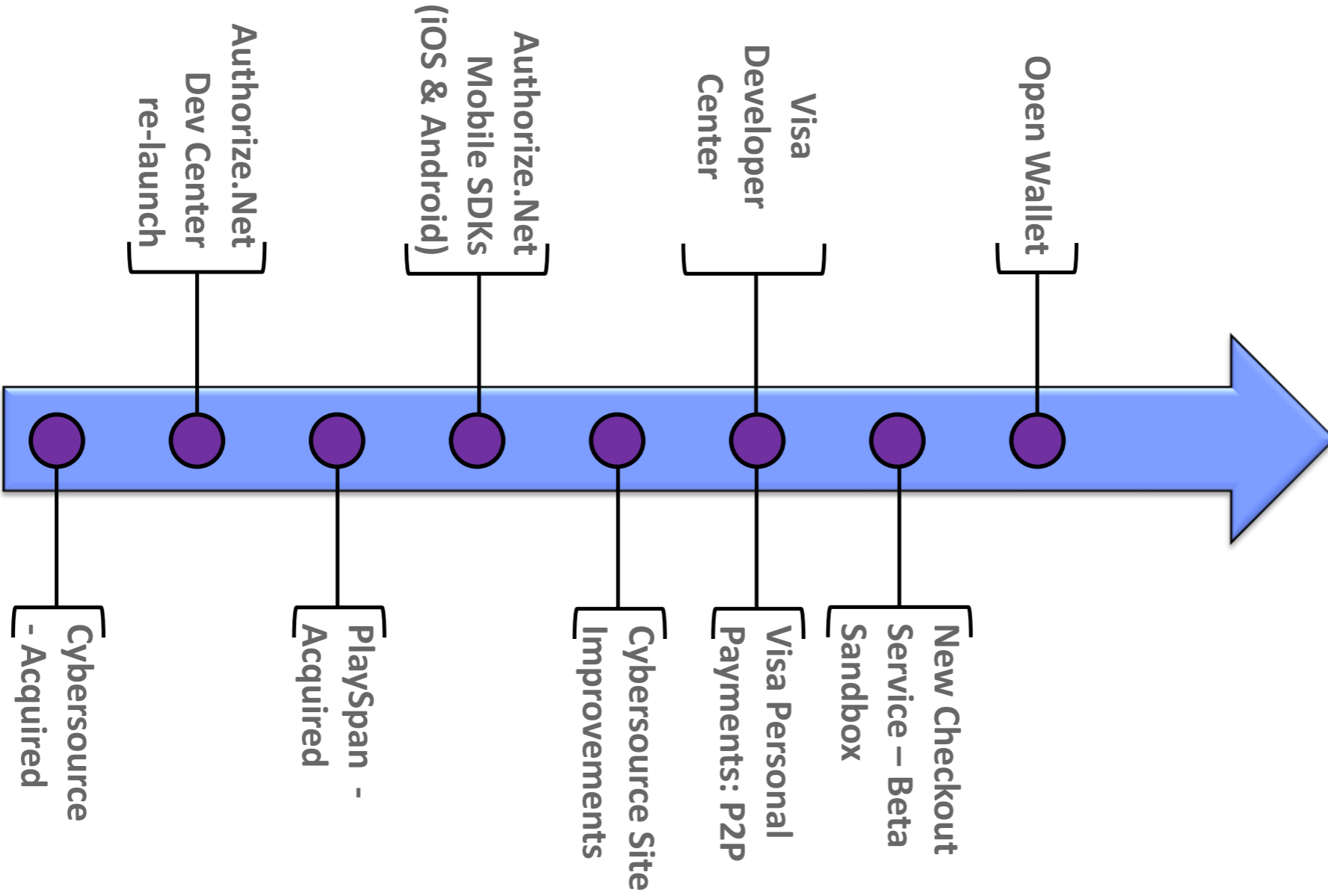 - Maven
  - SVN
  - Jenkins - CI

- **Others**
  - Encryption (lots of this!)
  - Open LDAP
  - Hadoop

Visa Innovation Timeline

Authorize.Net
Dev Center
re-launch

Authorize.Net
Mobile SDKs
(iOS & Android)

Visa
Developer
Center

Open Wallet

Cybersource
- Acquired

PlaySpan -
Acquired

Cybersource Site
Improvements

Visa Personal
Payments: P2P

New Checkout
Service – Beta
Sandbox

Developer.Visa.Com

VISA Developer Center

Overview

V.me by Visa
An open digital wallet with integrated payment acceptance.

CyberSource
Payment and risk management for medium / large corporations.

Authorize.Net
Online and mobile payment acceptance for small business.

PlaySpan
Global payments for games, apps, and social media.

Visa
Visa Personal Payments for financial institutions.

Payment Technologies Sized for Your Business

Online. In-app. In-game. Behind the scenes.

With payment technologies for merchants, acquirers and financial institutions, we've got you covered.

Our global payment platform services include fraud and risk management, dispute resolution, and other business-enhancing applications. Together, these elements provide secure, convenient, and reliable payment options in 190+ countries and territories.

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Developer.Visa.Com

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Overview

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Build the Future of Digital Payments

Add payment acceptance to your app or website with a simple integration.

Whether you're developing the next cool app or an eCommerce store, V.me by Visa lets your customers pay quickly and easily with their favorite payment methods, including MasterCard and American Express. All you need is a V.me developer account, keys we give you, some proprietary tags, and a few snippets of JavaScript to include in your app.

Learn about V.me by Visa ⊙

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V.me

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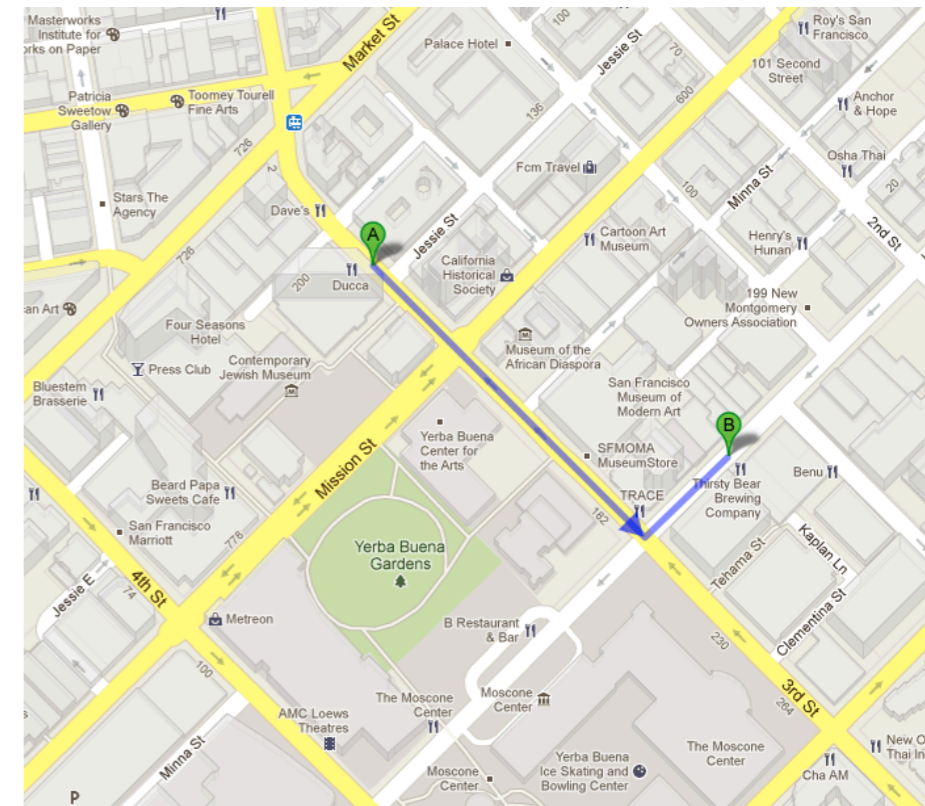
OK, that's it

- Thank you for staying awake

- Please join us at the Thirsty Bear (Thursday 6-9pm)

Thursday, November 17th
6:00pm-9:00pm

ADMIT ONE

V.me by Visa

Join Visa to celebrate the unveiling of the developer center for V.me by Visa

ThirstyBear Brewing Co., Billar Room
661 Howard Street
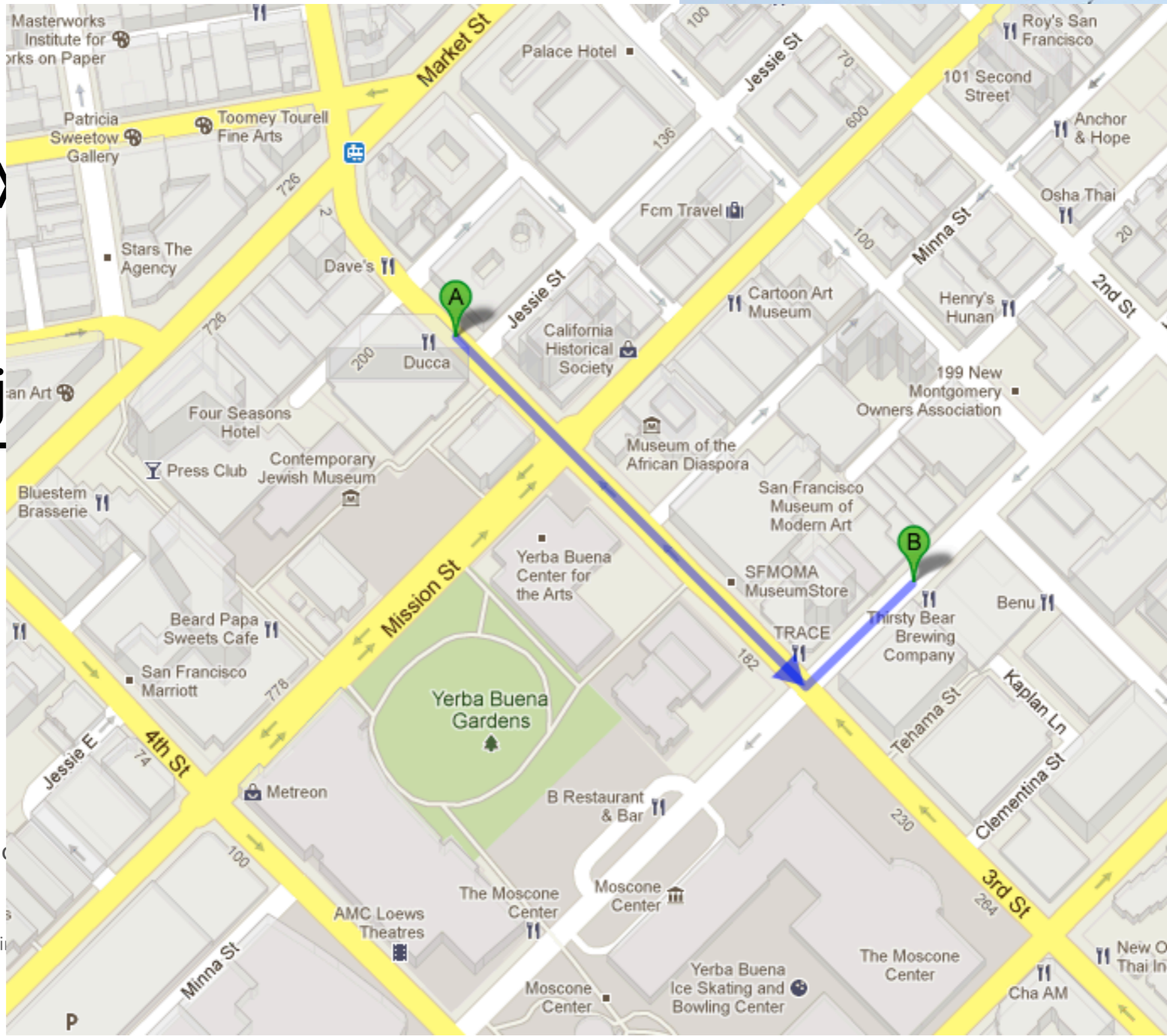
Hosted Bar
Appetizers Served

Thursday, November 17th
6:00pm-9:00pm

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It's a block away

- Thank y[...]

- Please j[...]
  Bear (T[...]

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