

Visa Research

So what exactly does a financial technology research lab do and why?

Ron Perez, VP and Head of Security & Blockchain Research

Visa is a Different Type of Tech Company

WHO WE ARE

- Global payments technology company
- Transaction-processing network that connects cardholders, merchants and financial institutions

WHO WE ARE NOT

- Credit card issuer
- Lender
- Exposed to consumer credit risk



Visa is the Largest Payment Network



3 billion
CARDS



148 billion
TRANSACTIONS



\$10 trillion
TOTAL VOLUME



17 thousand
FINANCIAL INSTITUTIONS



44 million
MERCHANT OUTLETS

U.S. CARDS



U.S. SPEND

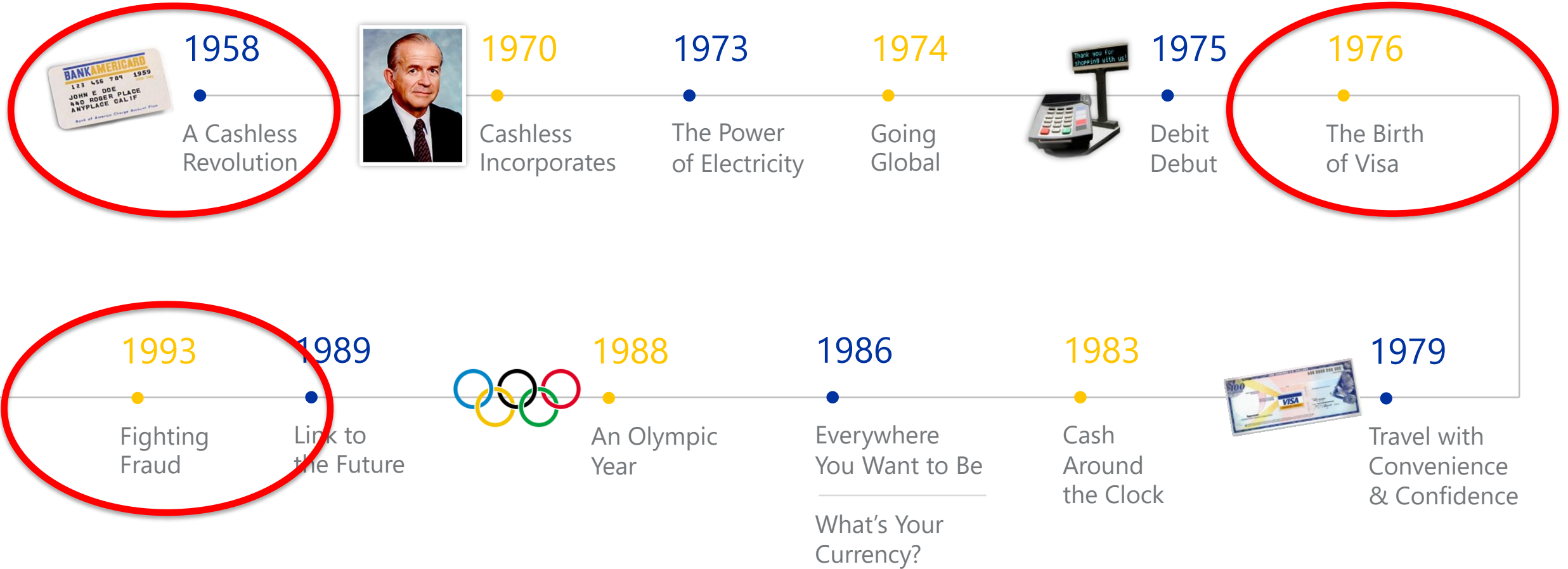


Visa is a Silicon Valley Leader



Global payments technology company that connects consumers, businesses, banks & governments enabling them to use digital currency and leave cash and checks behind.

Nearly 60 Years of Continuous Innovation



Nearly 60 Years of Continuous Innovation



1995

Debit Goes Mainstream

America's Most Popular Sport

1996

Financial Knowledge for the Masses

1997

Twelve Months, Twelve Zeroes



2000

Easy as ABC
A Billion Cards

2004

Debit Card Volume Surpasses Credit

Advanced Authorization

2005

New Directions, New Look

2016

Rio Olympic Games

2014

Apple Pay

Visa Checkout Launches

2010

A Beautiful Game

2009

More People Go with Visa

Visa Launches Currency of Progress

2008

A Very Public Statement

The Mobile Revolution



2007

Going Mobile

Incorporating Change

2006

Success Quadrupled

Visa's Payment Products and Channels

PAY LATER

Credit products

draw funds from a
credit line

PAY NOW

Debit products

draw funds from a
current account

PAY BEFORE

Prepaid products

draw funds from a **pre-funded card account**

PLASTIC



ONLINE



VISA Checkout

MOBILE



 Pay

The Innovation Continues...

Mobile



Rethinking how electronic payments can provide greater **security, immediacy and value** to consumer and merchants

Tokenization



Removing friction from checkout experience and **improving the security and convenience** of digital payments

Opening up networks to innovation



Opening the edge of our network and exposing it to **millions of engineers globally**

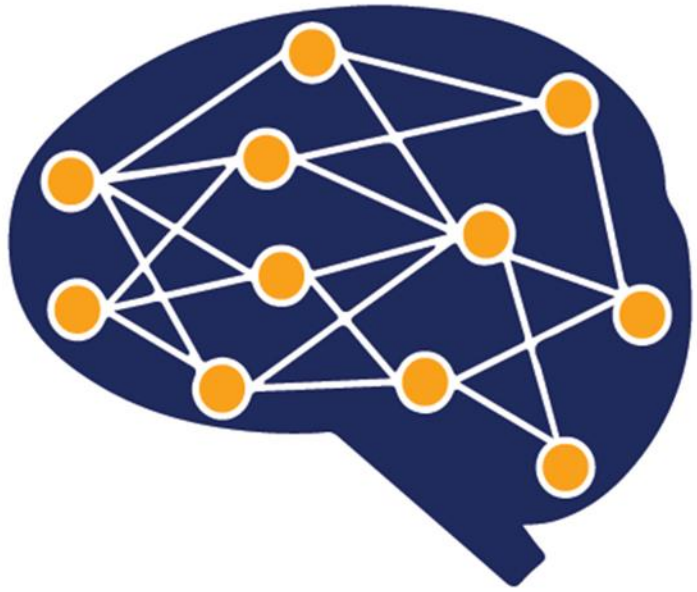
Introducing Visa Research

Visa Research – Overview

- Almost 2 years old
 - Chartered with a focus on the scientific foundations of existing, emerging, and future commerce related technologies across broad time horizons
- Mission Statement:
 - Conduct applied research on the most challenging problems in the payment industry and provide technical thought leadership to guide the company's future
- Rapidly growing team
 - Reach 24 fulltime staff this June: 19 Research Scientists, 3 Research Engineers, +Ops/Support
 - Robust intern program: 16 PhD students this summer (+1 spring intern)



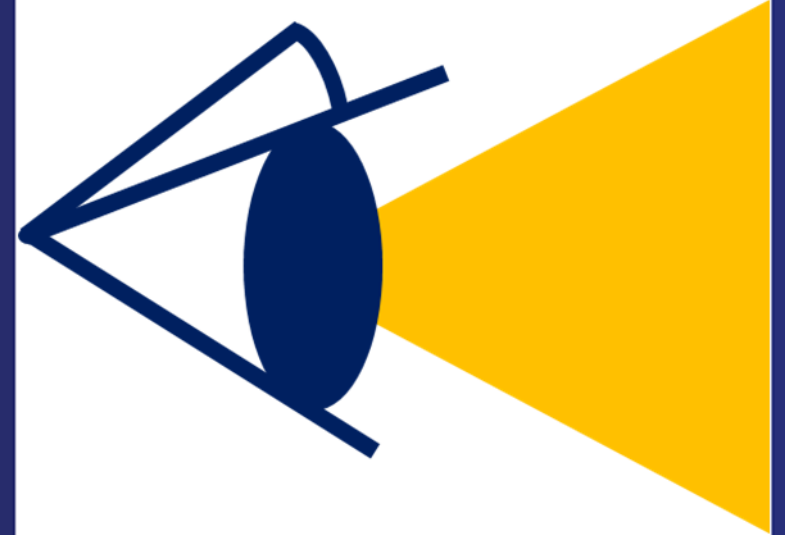
Visa Research – Three Focus Areas



Data Analytics



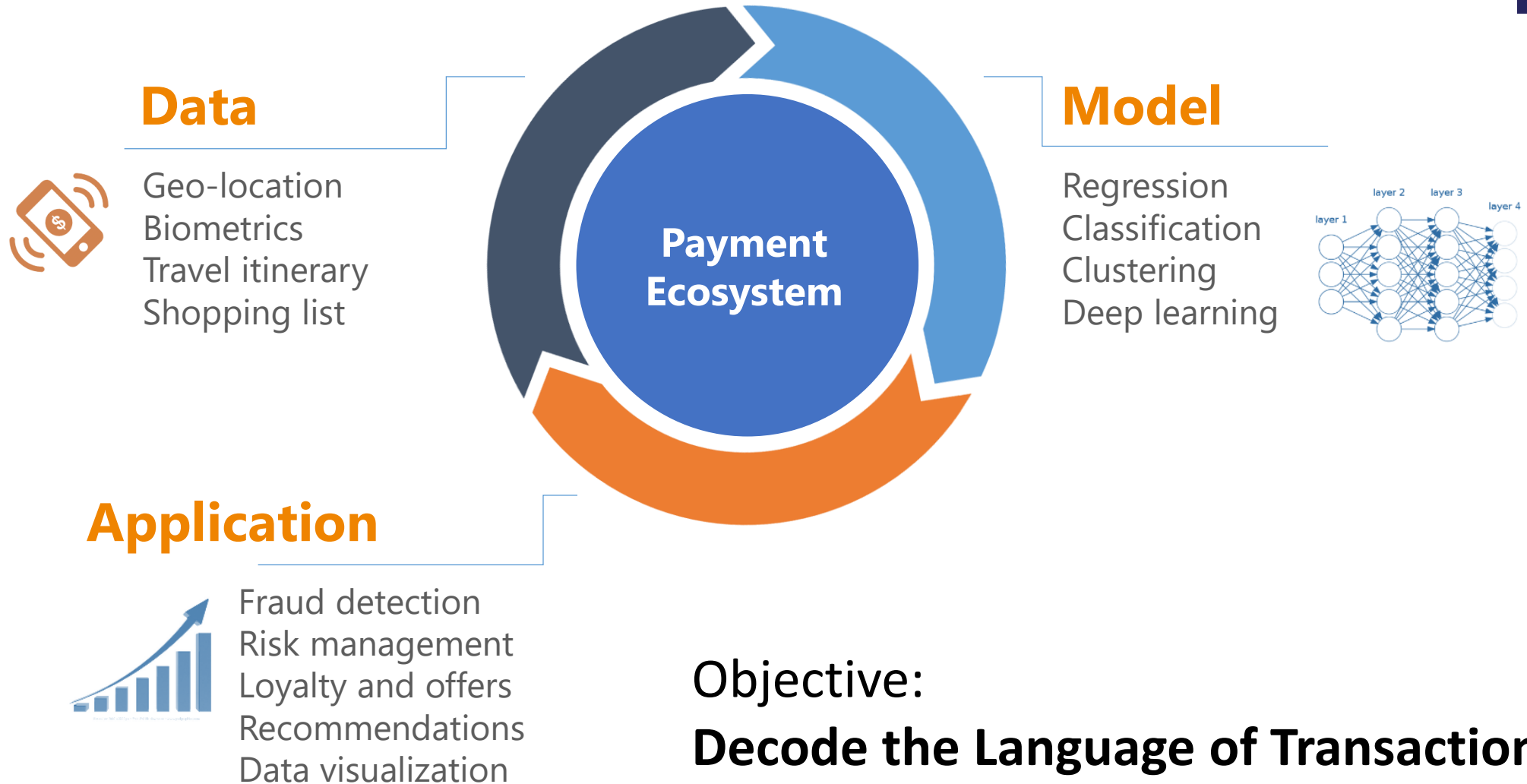
Security



Future of
Commerce

Visa Research – Data Analytics

Initial Research Focus Areas

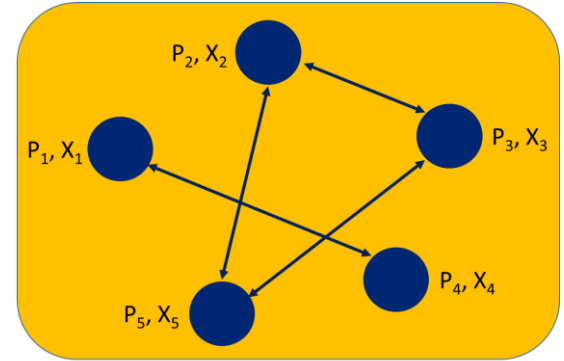


Visa Research – Security

Initial Research Focus Areas



- Advances in Cryptography
 - Leverage and advance the use of emerging cryptographic techniques such as Secure Multi-Party Computation, Search on Symmetric Encryption, Homomorphic Encryption, Obfuscation, and Post-Quantum Cryptography
- Secure Computing
 - Hardware and software foundations enabling near-term end-to-end secure computation, data and workload management across the distributed enterprise, between ecosystem partners, and to/from the sea of endpoints and devices



Parties learn only $f(x_1, \dots, x_n)$

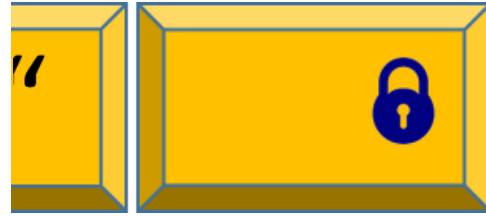
Objective: Balance advancements in cryptography and secure systems for strongest and most efficient context appropriate data acquisition, classification, protection and analysis across the computing spectrum

Visa Research – Future of Commerce

Blockchain – Initial Research Focus Areas



Performance & Scalability



Privacy with Auditability



Identity & Authentication

Industry [Research] Environments

- Your work and your research
- Your colleagues and collaborators
- How progress and achievement are measured
- Your career growth and options
- Culture: lab and company

Welcome!

To Palo Alto



VISA
Research

Thank you!