Banking Technology Trends

Steve Shaw

VP, Strategic Marketing, Digital Banking Group

May 2, 2016

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What Happens in 60 Seconds

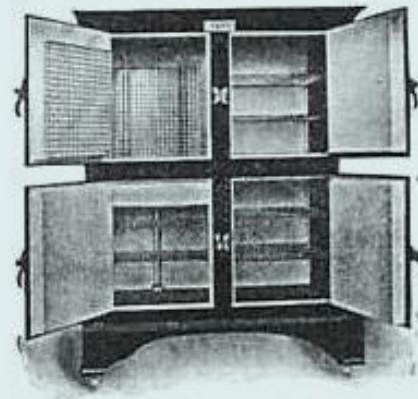# In Memoriam

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Industry Transformations

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ICE HARVEST

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ICE FACTORY

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FRIDGE

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Remember these?

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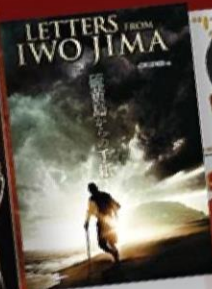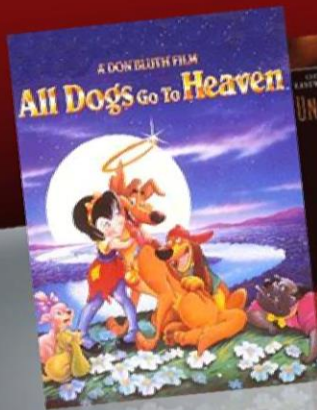
and then there was one….

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The Digital Transformation Has Affected Photography

Then

Now

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The Digital Transformation Has Affected Music

Then

Now

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The Digital Transformation Has Affected Social Networking

Then

Now

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The Digital Transformation Has Affected Banking

Then

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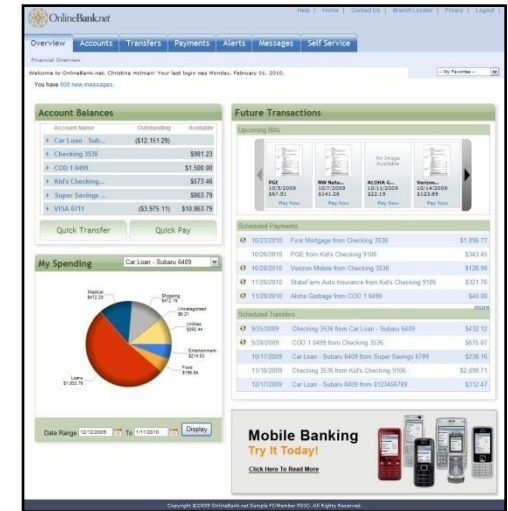
People

aren't thinking about financial services

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They are thinking about what they need to get done in their financial lives…

- Simplicity of accessing money and making payments

- Security of account information

- Ubiquity of digital access (PC, phone, tablet)

- Speed of sending and receiving money and information

- Enabling users to understand their entire financial picture

- Building financial engagement

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Agenda

- Millenials & Technology Driving Disruptive Innovation

- Mobile Banking & Payments driving a new banking experience

- Digital Technology Transforming the Branch

- Security as a differentiator

- Need for Big Data and Analytics

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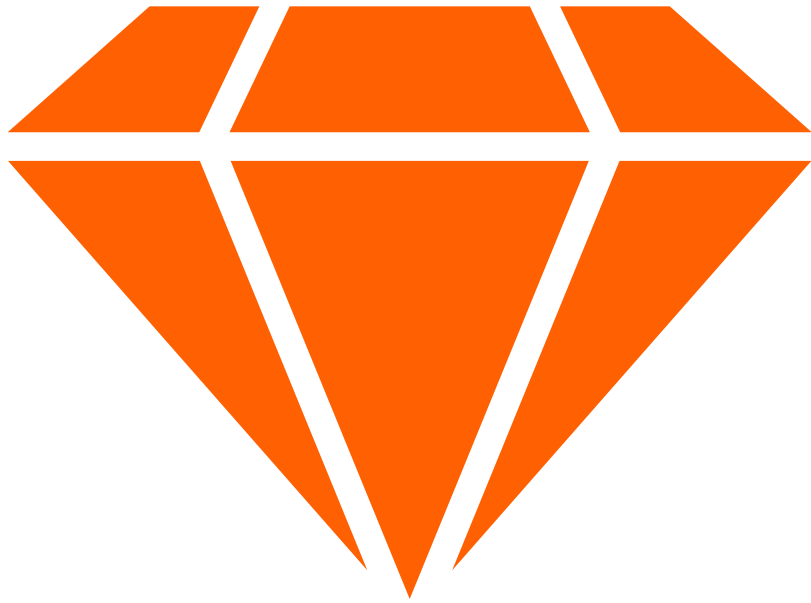
Disruptive Innovation

"The **Internet of Things (IoT)** describes the phenomenon of everyday devices connecting to the Internet through tiny embedded sensors and computing power."

Market Trends
Technology Advancements Have Proliferated Digital Devices

1.6 Billion
PCs
worldwide

6.8 Billion
Mobile phones
worldwide

1.4 Billion
Smartphones

**130+
Billion**
App
Downloads
Worldwide

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Applications of IoT

Industrial automation

Smart grid

Home automation

Wearables

Graphic: Deloitte University Press | DUPress.com

Wearables: Smartphone Banking Apps

THE FIRST GENERATION OF SMARTWATCH BANKING APPS

HELP FEATURES
55% FAQs, slideshows, demo modes or videos, info buttons

MARKET INFORMATION
18% Up-to-date market news, indices, display of watch list

MONEY TRANSFERS
23% Payments and payment confirmations, cash withdrawals

NOTIFICATIONS/ALERTS
29% Account movements or limits, travel alerts, incoming messages

FINANCIAL OVERVIEW
55% Account balances, past transactions, graphical display of financial situation

CONTACT OPTIONS
5% Start a call/conversation, chat

BRANCH FINDER
23% Maps with directions, contact details, opening hours

PERSONALIZED MOBILE MOMENTS
9% Personal welcome when accessing the app

MYPRIVATEBANKING research

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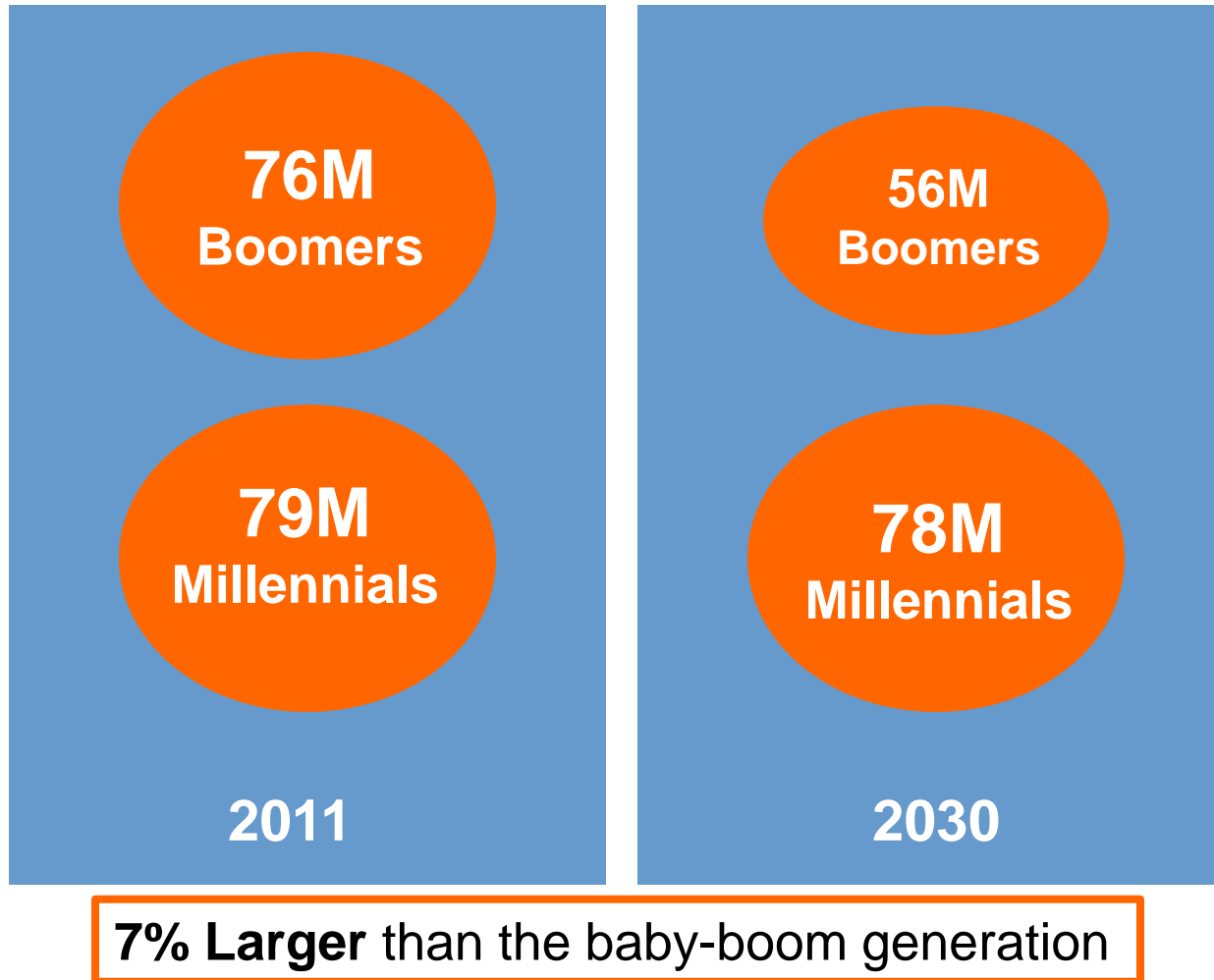# Who Are Millennials?

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Well informed

Highly connected

Tribal sharers and followers

Demand technology

More Millennials than Baby Boomers: Largest Population Cohort* in U.S. History
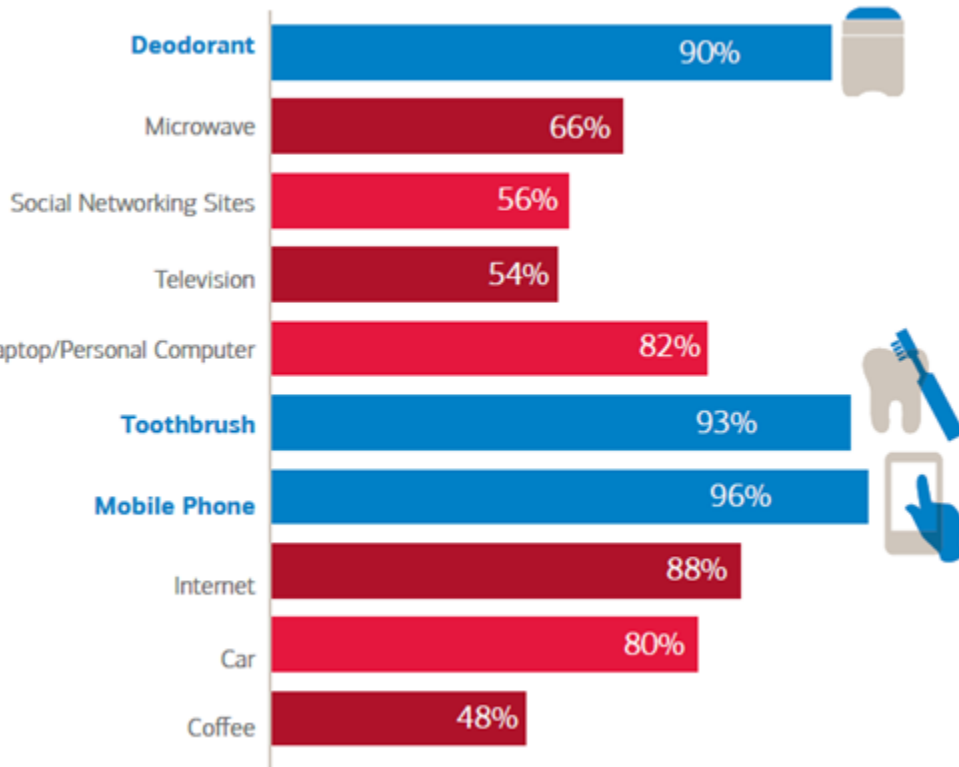
WorldMap

76M
Boomers

79M
Millennials

2011

56M
Boomers

78M
Millennials

2030

7% Larger than the baby-boom generation

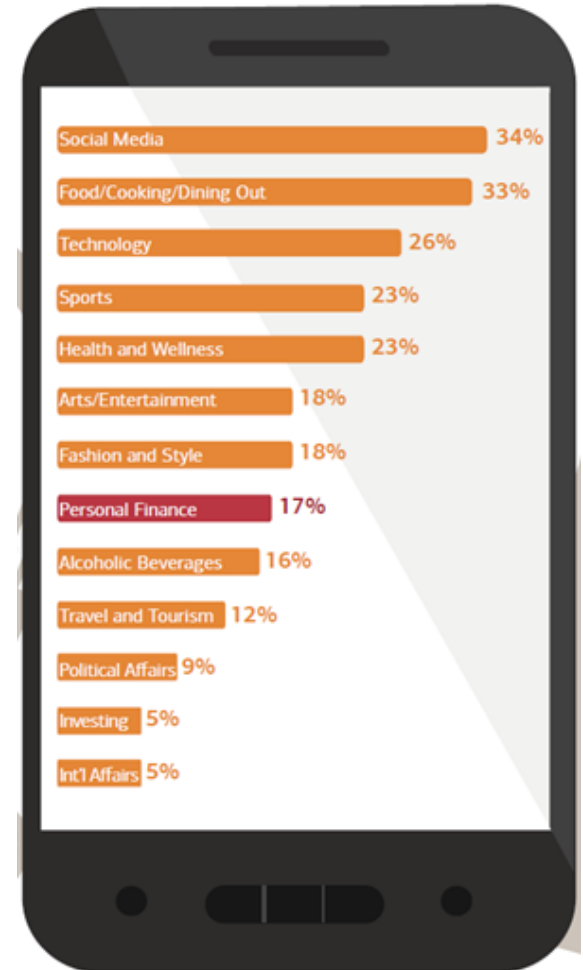*U.S. Census Bureau, 2012; Boomers born 1946-1964 and Millennials born 1980-2000

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Understanding Millennials

What is most important to your daily life?

Item	Percent
Deodorant	90%
Microwave	66%
Social Networking Sites	56%
Television	54%
Laptop/Personal Computer	82%
Toothbrush	93%
Mobile Phone	96%
Internet	88%
Car	80%
Coffee	48%

What do you have expertise in?

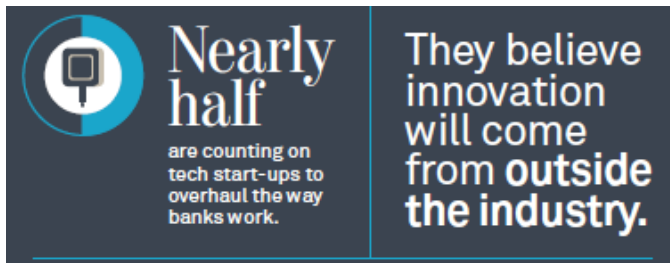| Item	Percent
Social Media	34%
Food/Cooking/Dining Out	33%
Technology	26%
Sports	23%
Health and Wellness	23%
Arts/Entertainment	18%
Fashion and Style	18%
Personal Finance	17%
Alcoholic Beverages	16%
Travel and Tourism	12%
Political Affairs	9%
Investing	5%
Int'l Affairs	5%

Source: Bank of America/USA TODAY, Better Money Habits Millennial Report, Fall 2015

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Millennials' Views on Disruption

MILLENNIAL DISRUPTION INDEX

Banking is at the **highest risk** of disruption.
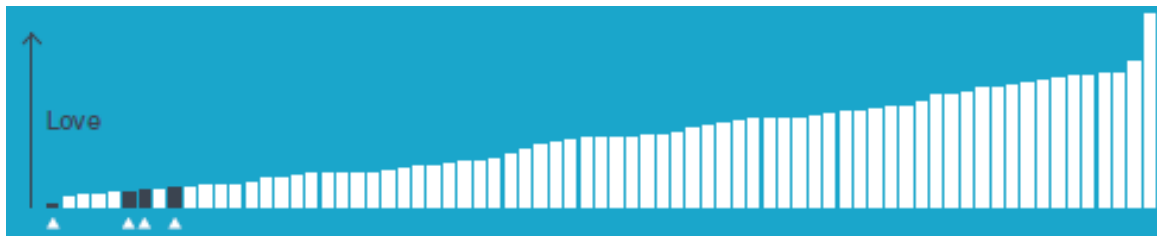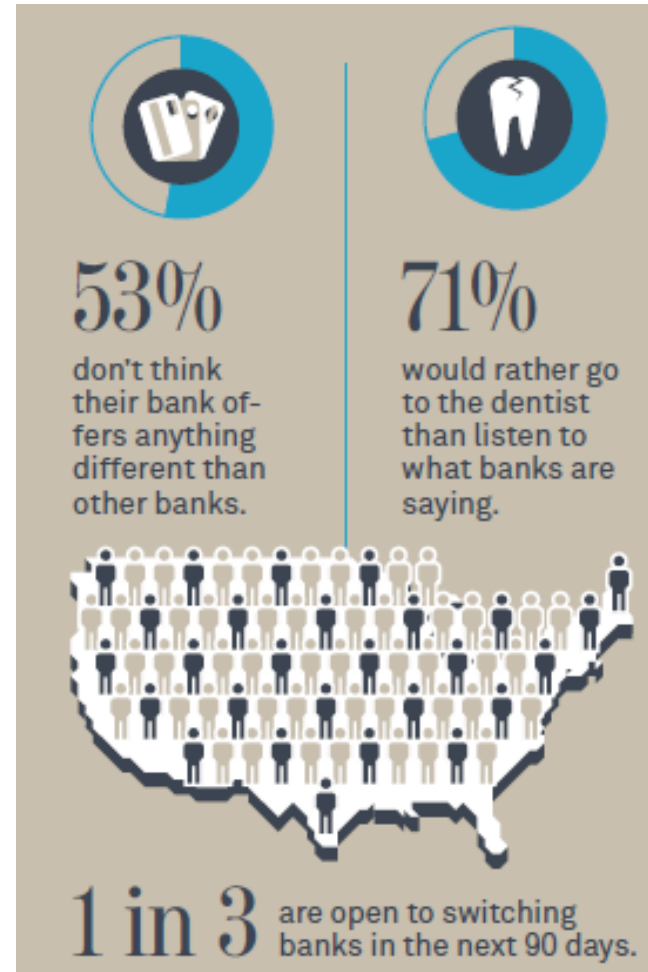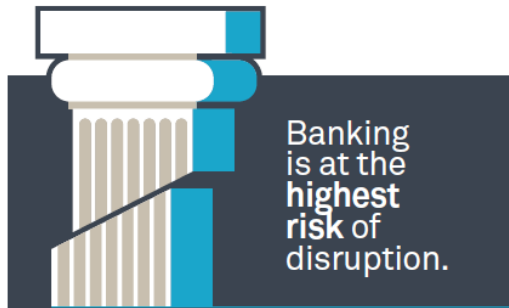
Love

All 4 of the leading Banks are among the ten **least loved** brands by Millennials.

Nearly half are counting on tech start-ups to overhaul the way banks work.

They believe innovation will come from **outside the industry.**

33% believe they won't need a bank at all.

53% don't think their bank offers anything different than other banks.

71% would rather go to the dentist than listen to what banks are saying.

1 in 3 are open to switching banks in the next 90 days.

Source: Scratch, "The Millennial Disruption Index,"

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Digital Natives Disrupt, Transform and Drive

"This year, Millennials will overtake Baby Boomers."

    – Pew Research Center, January 2015

Thomas Suarez, 12-year-old developer, giving a TED Talk

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Brewing Threat to Traditional Financial Institutions

venmo	GObank	Pay	LendingClub	ripple
$2.1 Billion TPV processed in 3Q15	**$1,000** Average active customer monthly deposits	**90 Percent** Percent of U.S. credit purchase volume represented by registered FIs	**$13.4 Billion** Loans processed since 2007	**Three-to-Six Seconds** The length of international interbank transfer
P2P	Checking Account	Mobile Payments	P2P Loans	International Remittance

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Disruptors Want It All

CB INSIGHTS

www.cbinsights.com

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Retailers Are Making Inroads Into Banking

16M Mobile Users

9M Mobile Transactions Per Week

Who am I?

20% Percentage of U.S. trans Via Mobile

10M Rewards Members

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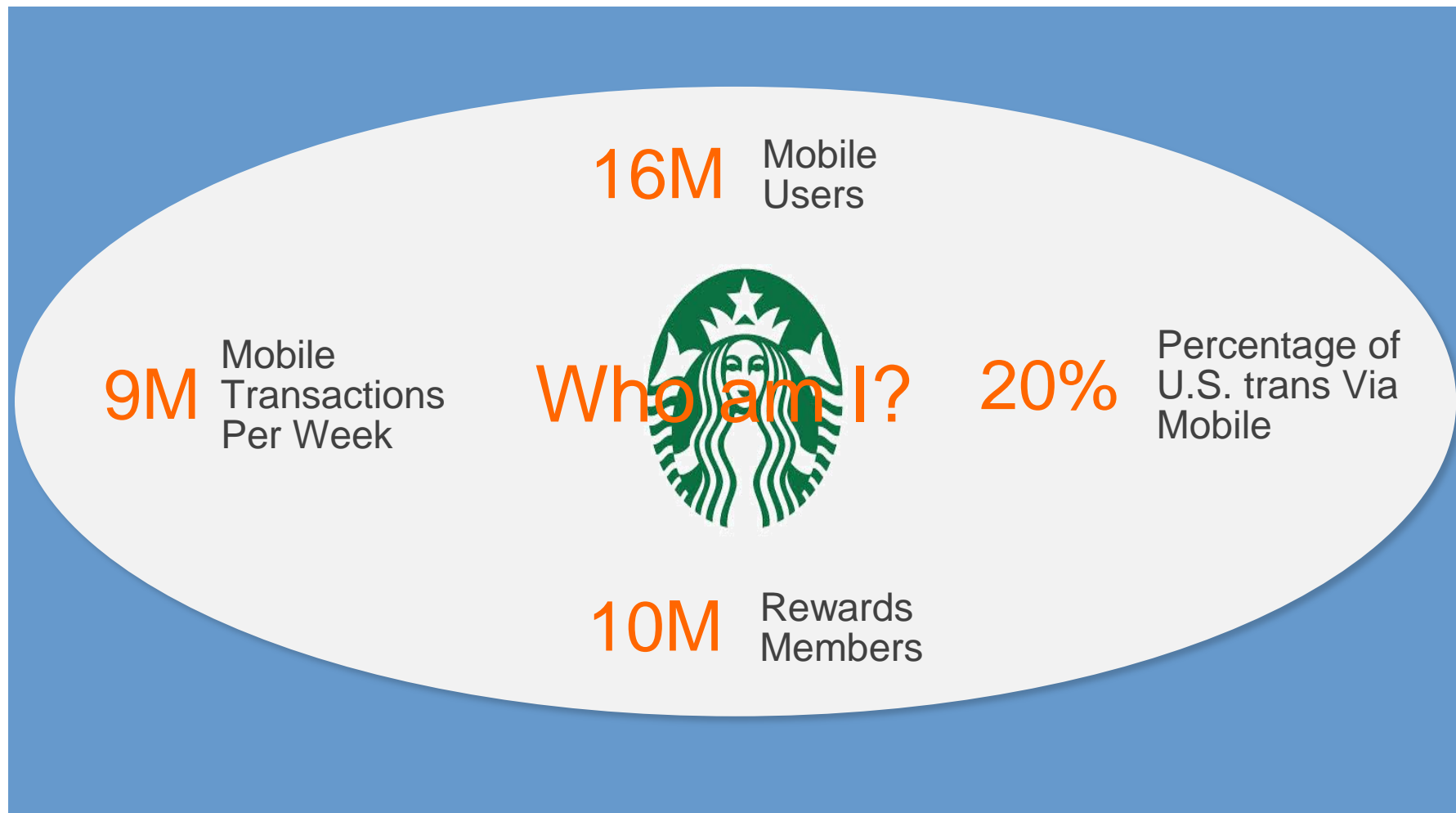
And Some of Them Look a Lot Like Banks

4,500 U.S. Locations

1 Checking Account Products

Walmart

8 Card Products

2 Money Transfer Products

42,000 No-Fee ATMs

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New Breed of Disruptive Companies are the Fastest Growing in History

UBER → World's Largest Taxi Company = Owns No Vehicles

facebook → World's Most Popular Media Owner = Creates No Content

Alibaba.com → Most Valuable Retailer = Has No Inventory

airbnb → World's Largest Accommodation Provider = Owns No Real Estate

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Mobile Banking & Payments Driving a New Banking Experience

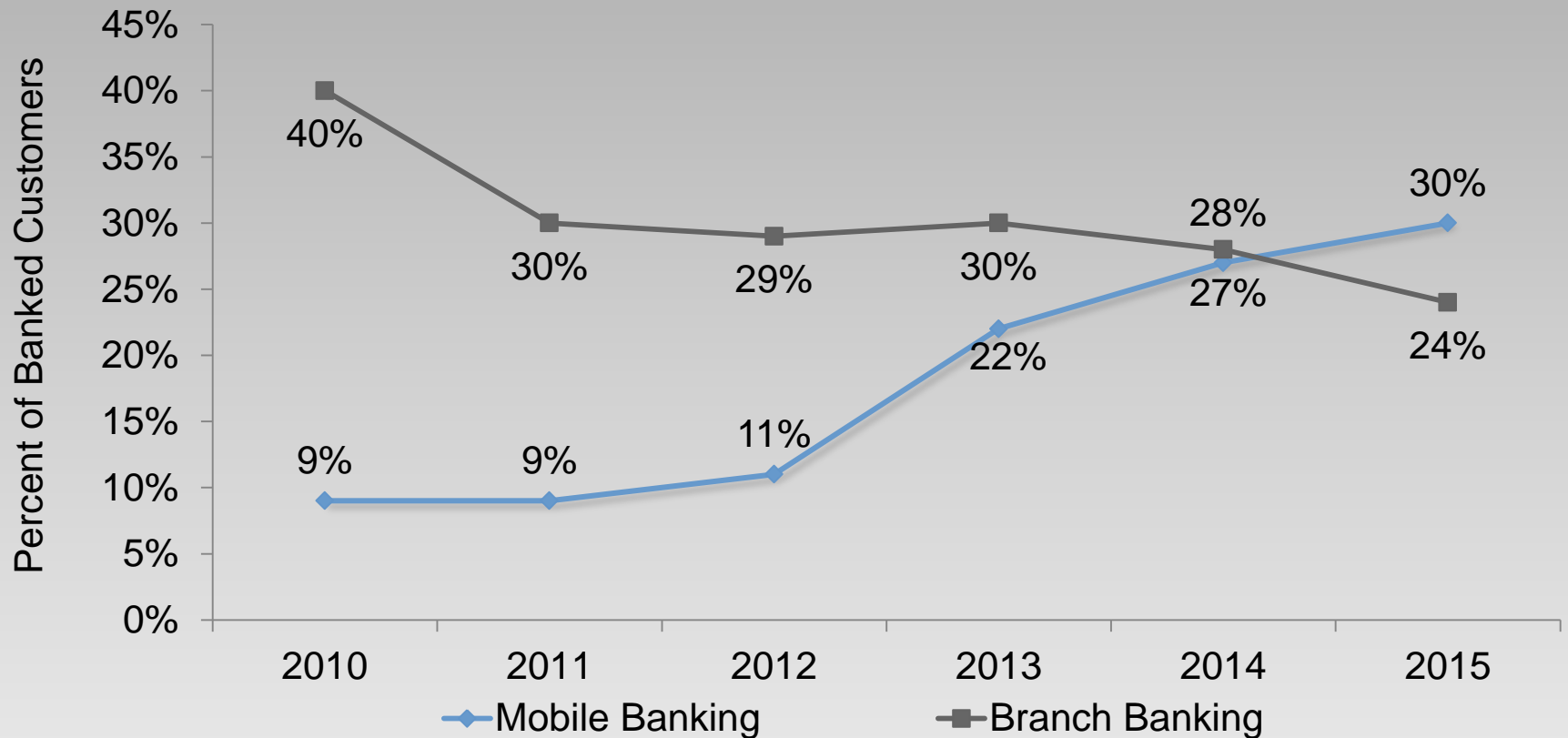# Smartphone, Tablet, and Mobile Banking Users are Increasing Together

Forecast of Smartphone, Tablet, and Mobile Banking Users, 2011-2020E
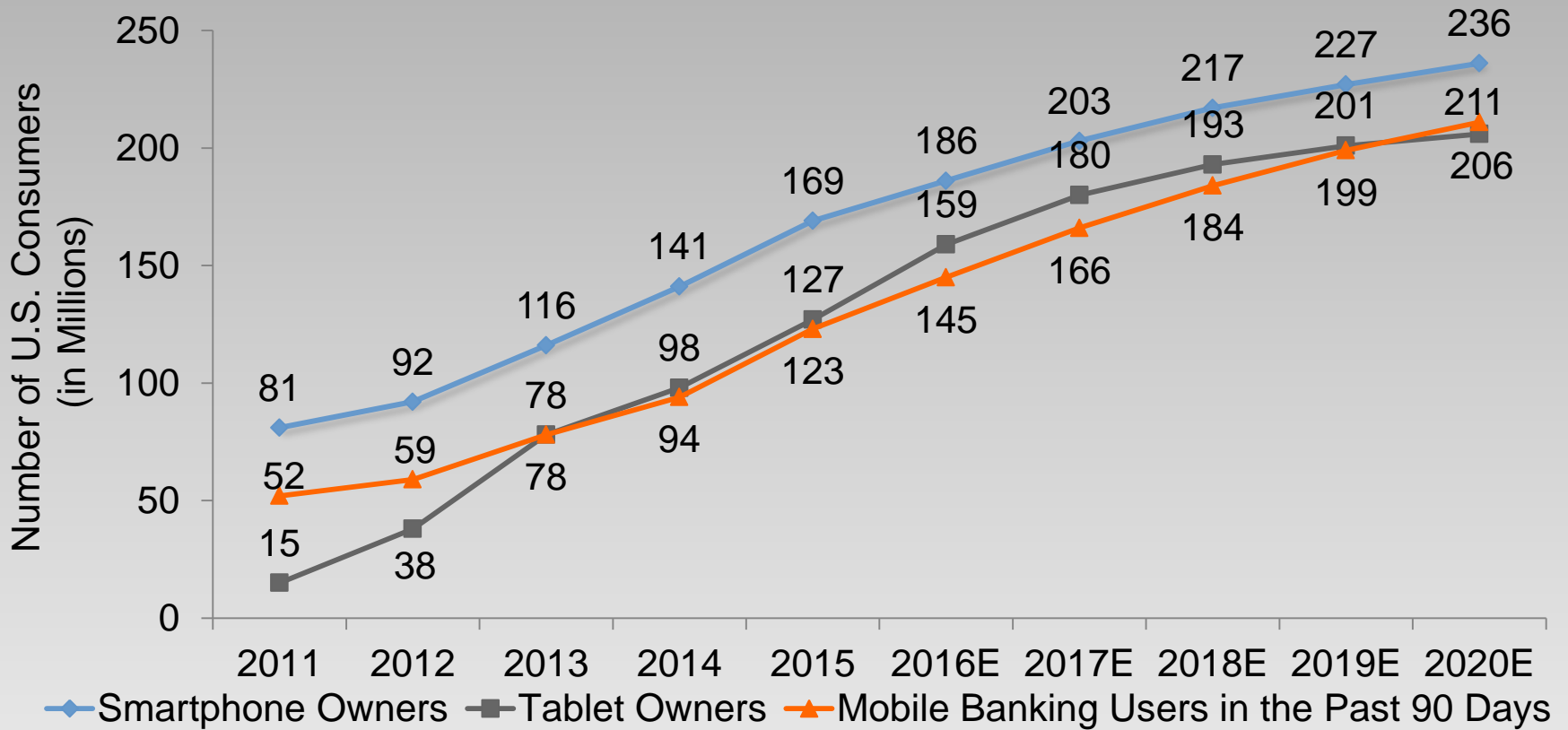
Source: Javelin Strategy and Research, "2015 Mobile Banking, Smartphone, and Tablet Forecast," December 2015

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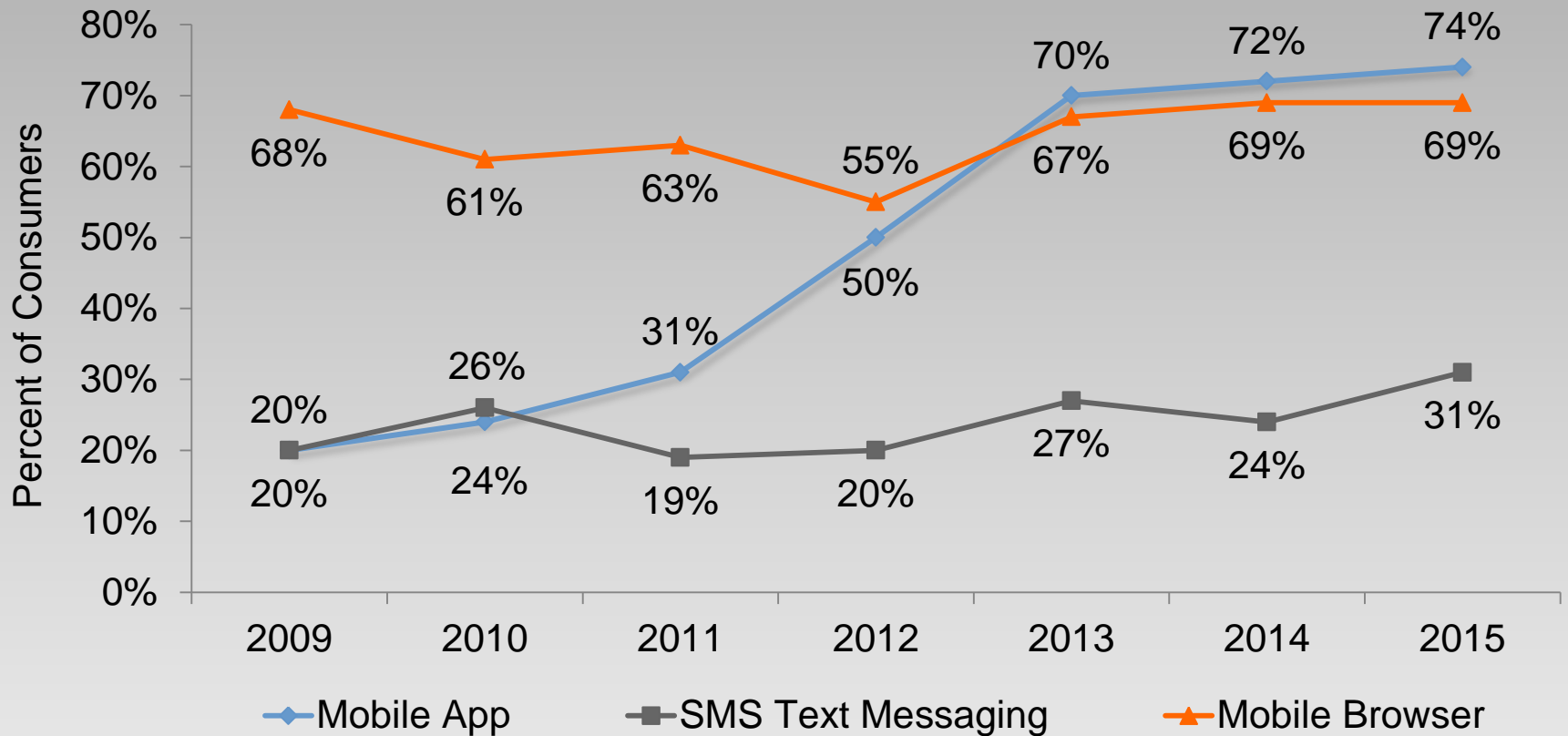# Mobile Banking is Shrinking Branch Banking

Weekly Branch Bankers vs. Weekly Mobile Bankers, 2010-2015

Percent of Banked Customers

Mobile Banking: 9%, 9%, 11%, 22%, 27%, 30%
Branch Banking: 40%, 30%, 29%, 30%, 28%, 24%

Mobile Banking   Branch Banking

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Mobile Apps Remain the Most Popular Mobile Banking Method

Methods Used to Conduct Mobile Banking by Percentage, 2009-2015

Mobile App, SMS Text Messaging, Mobile Browser values:

- Mobile Browser: 68% (2009), 61% (2010), 63% (2011), 55% (2012), 67% (2013), 69% (2014), 69% (2015)
- Mobile App: 20% (2009), 24% (2010), 31% (2011), 50% (2012), 70% (2013), 72% (2014), 74% (2015)
- SMS Text Messaging: 20% (2009), 26% (2010), 19% (2011), 20% (2012), 27% (2013), 24% (2014), 31% (2015)

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Tablet Banking Use is More Informational Than Transactional

Tablet Owners: Use of Transactional Features (Comparison to Phone %)

- Ordered Something to Be Paid Online
- Use Biller Direct
- Transfers Between My Accounts at Bank
- Use FI Bill Pay
- Made a Loan Payment
- Deposit Check Using Tablet Camera
- Sent or Receive Money From Other People
- Make a Payment at a Check Out Terminal

(0% – 40%)
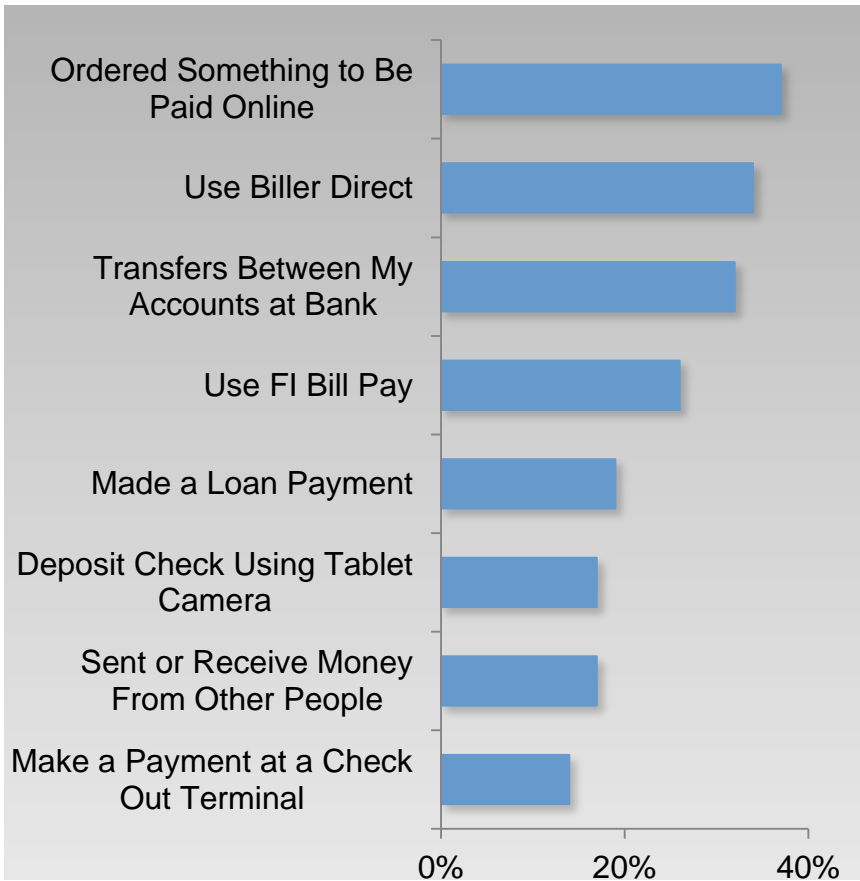
Tablet Banking Users: Use of Informational Features
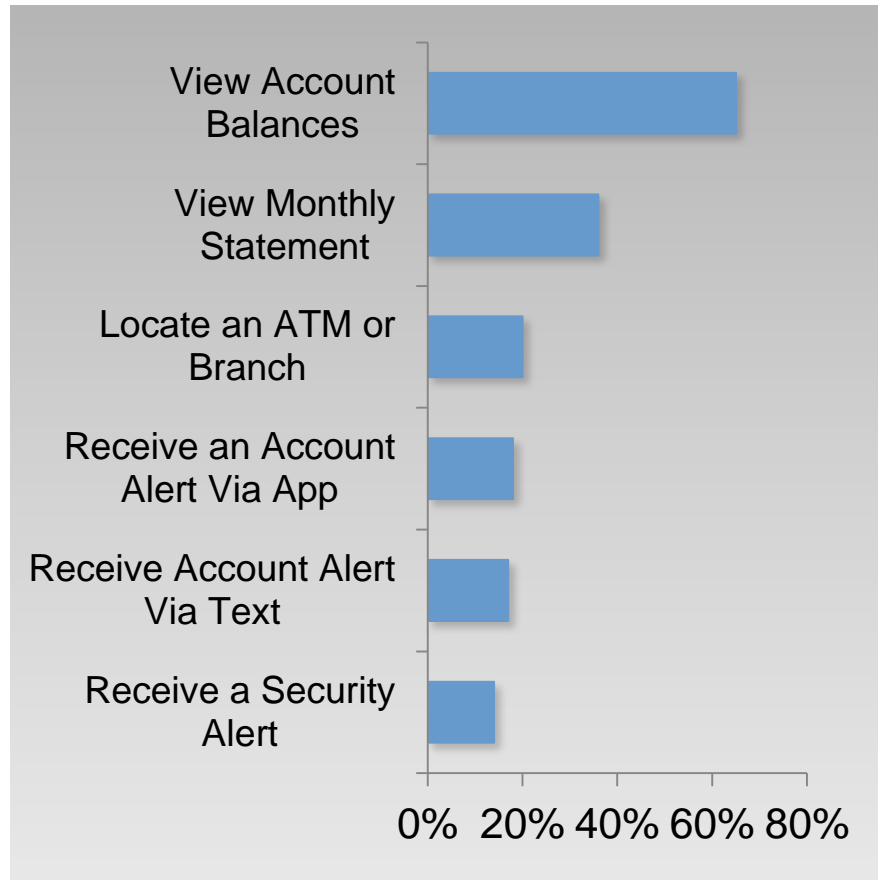
- View Account Balances
- View Monthly Statement
- Locate an ATM or Branch
- Receive an Account Alert Via App
- Receive Account Alert Via Text
- Receive a Security Alert

(0% 20% 40% 60% 80%)

CONFIDENTIAL – INTERNAL

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Mobile Transactions Post Strongest Growth:
29% CAGR in 2011-2017

U.S. Delivery Channel Transaction Volumes (in Millions), 2011-2017E
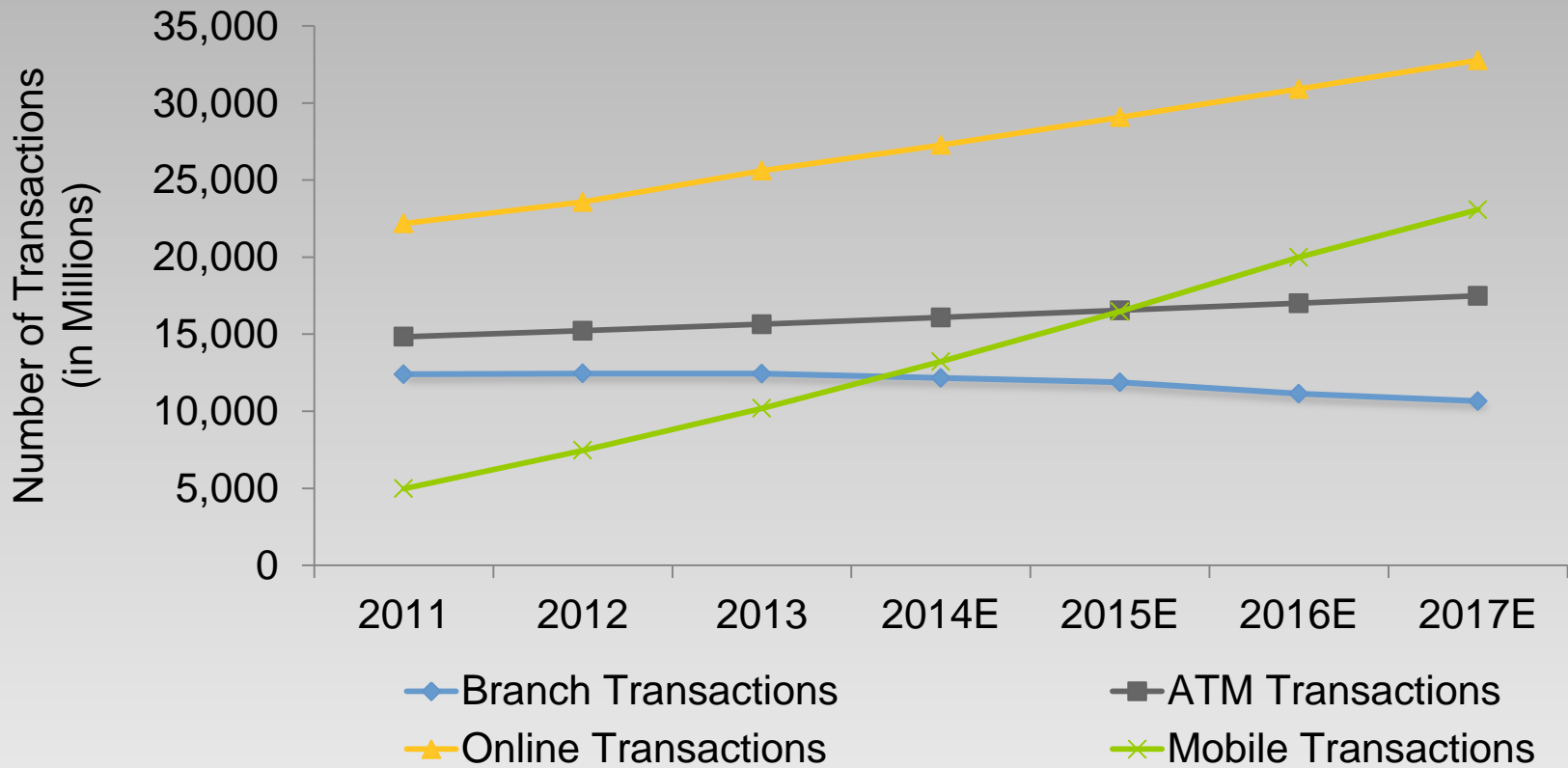
Number of Transactions (in Millions)

Legend:
- Branch Transactions
- ATM Transactions
- Online Transactions
- Mobile Transactions

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Use of Mobile Phone for Banking Activities and Transactions is on the Rise

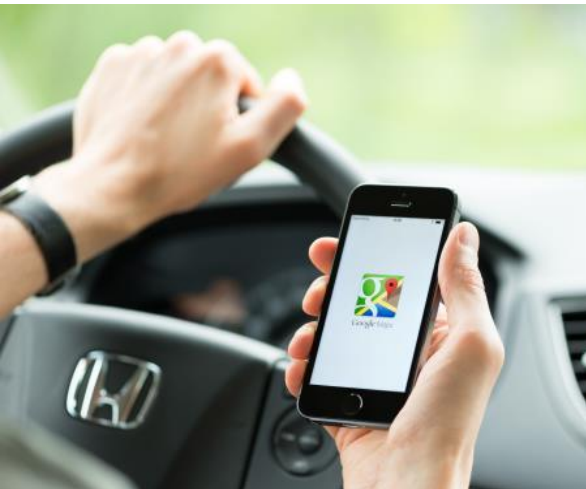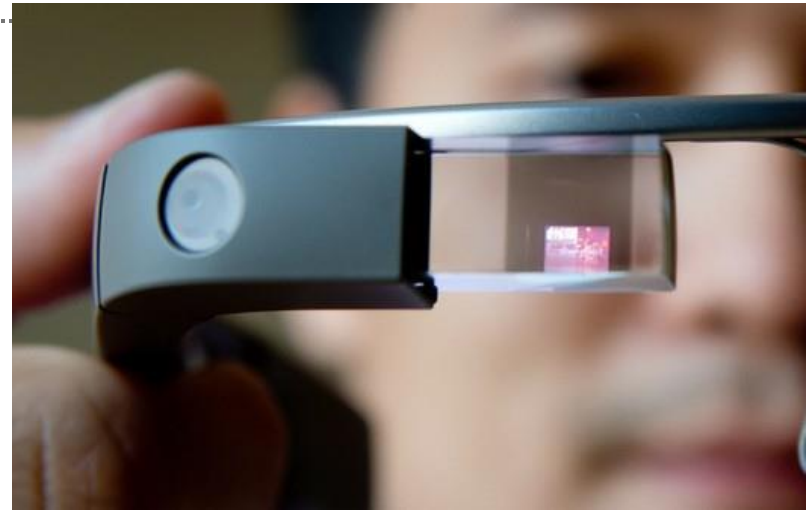## Percentage of Mobile Interaction and Mobile Banking Penetration, 2011-2014
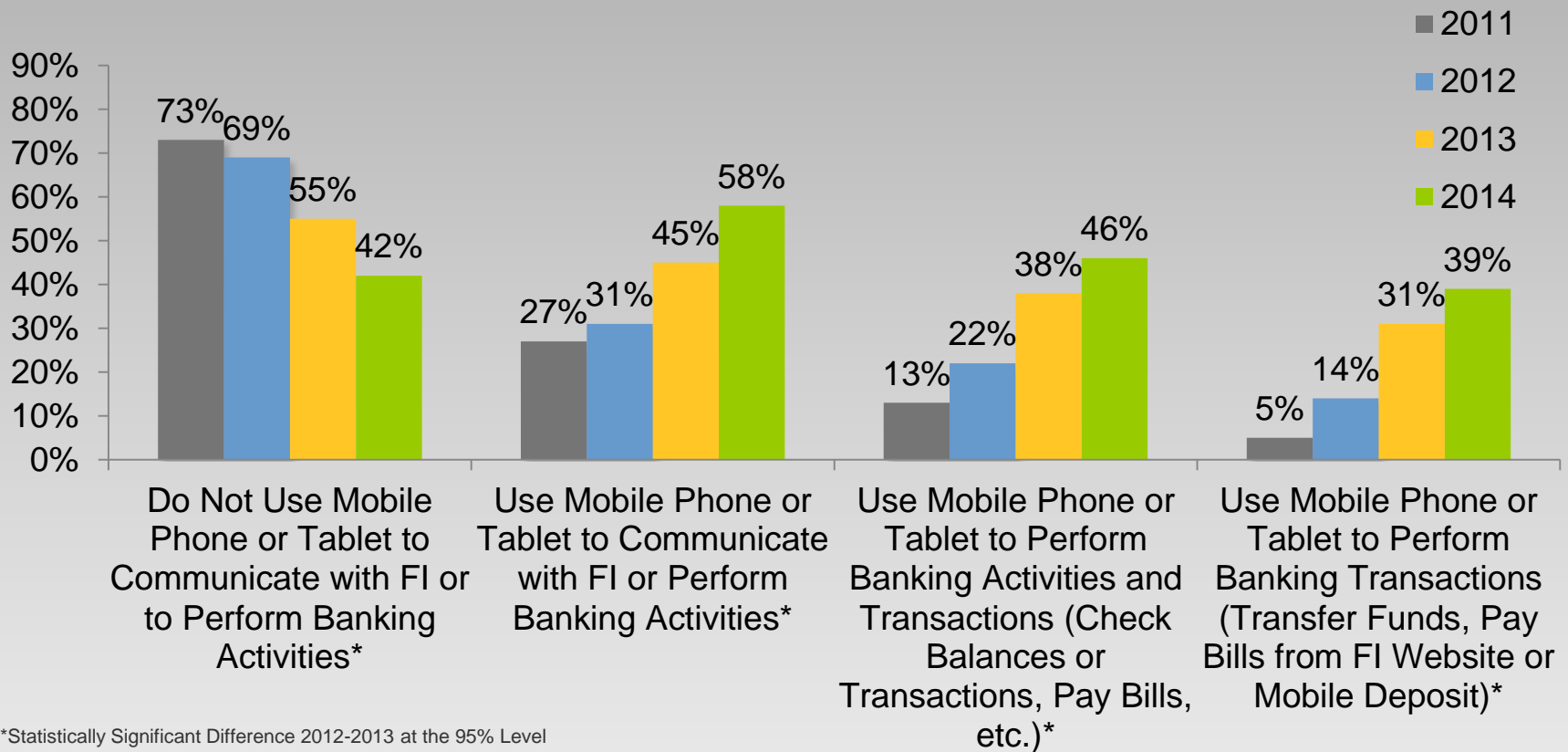
Legend: ■ 2011 ■ 2012 ■ 2013 ■ 2014

Do Not Use Mobile Phone or Tablet to Communicate with FI or to Perform Banking Activities*
- 2011: 73%
- 2012: 69%
- 2013: 55%
- 2014: 42%

Use Mobile Phone or Tablet to Communicate with FI or Perform Banking Activities*
- 2011: 27%
- 2012: 31%
- 2013: 45%
- 2014: 58%

Use Mobile Phone or Tablet to Perform Banking Activities and Transactions (Check Balances or Transactions, Pay Bills, etc.)*
- 2011: 13%
- 2012: 22%
- 2013: 38%
- 2014: 46%

Use Mobile Phone or Tablet to Perform Banking Transactions (Transfer Funds, Pay Bills from FI Website or Mobile Deposit)*
- 2011: 5%
- 2012: 14%
- 2013: 31%
- 2014: 39%

*Statistically Significant Difference 2012-2013 at the 95% Level

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Mobilization Is Driving a New Expectation for the Digital Banking Experience

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Features Aren't Enough Anymore

Costanza School of Financial Management

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Mobile Payments

A Mobile Payment is Simply…..
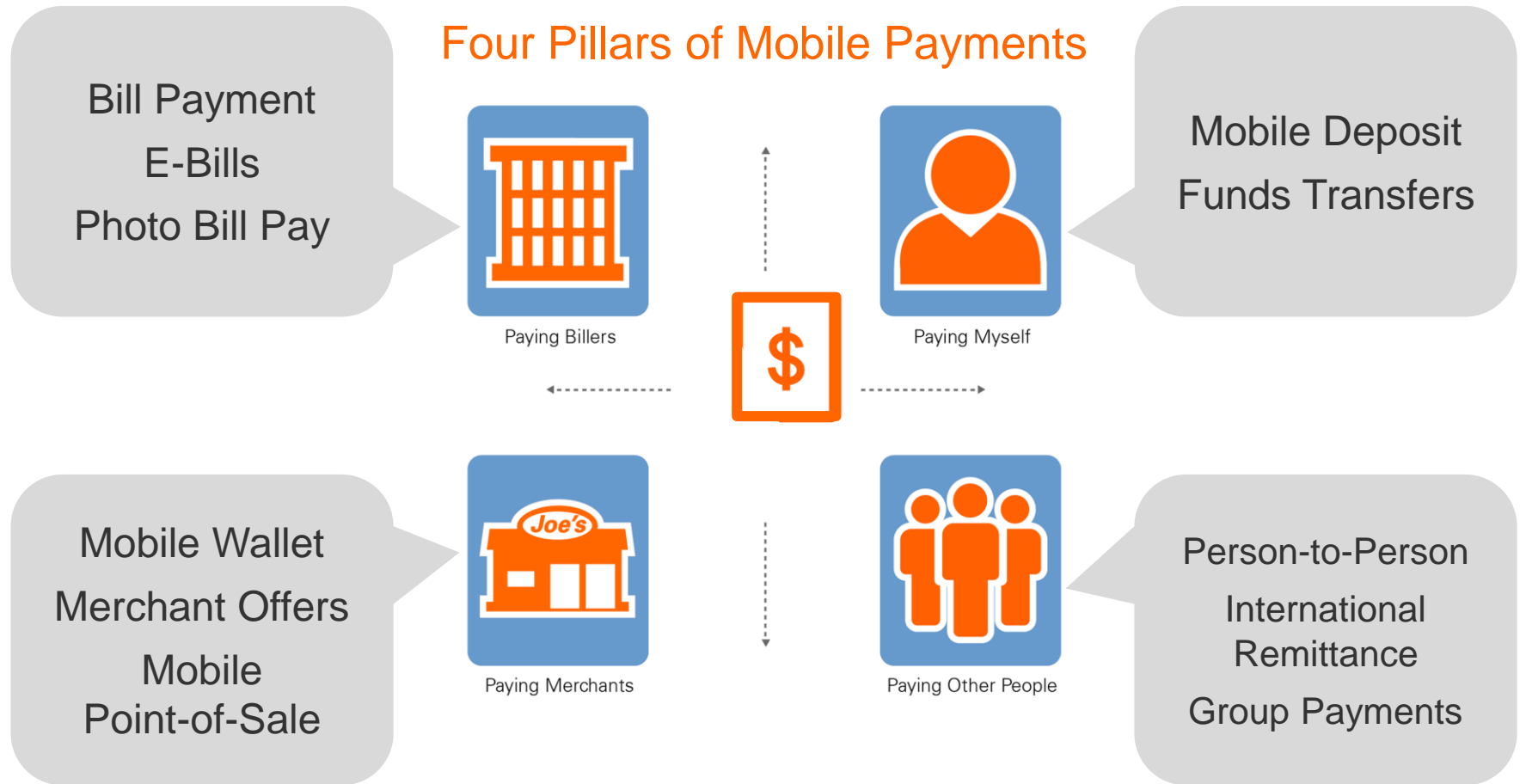
…a Payment on a Mobile Device

Mobile Payment = $ + 📱

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Mobile Payments

Four Pillars of Mobile Payments

Bill Payment
E-Bills
Photo Bill Pay

Paying Billers

Mobile Deposit
Funds Transfers

Paying Myself

Mobile Wallet
Merchant Offers
Mobile
Point-of-Sale

Paying Merchants

Person-to-Person
International
Remittance
Group Payments

Paying Other People

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Mobile Payments in Papua New Guinea?

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The World is Moving More Rapidly

Consumers expect fast delivery.
Right here, right now.

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Payments Have Not Kept Pace

- Days, not minutes

- Cut-off times

- Weekends and holidays

- Instant delivery options are very limited

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Consumers have increasing choices for all facets of financial services

venmo

DWOLLA

Square

PayPal

facebook.

Google Wallet

Apple

at&t

amazon

INTUIT

PaySimple

Check

f

tilt

ur Name Elliot   **Date**
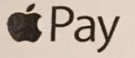
TIME FOR KIDS **YOUR $**
FINANCIAL LITERACY FOR KIDS

Many Ways to Pay

Read the chart to learn some of the advantages and disadvantages of different types of digital currency. Then answer the questions.

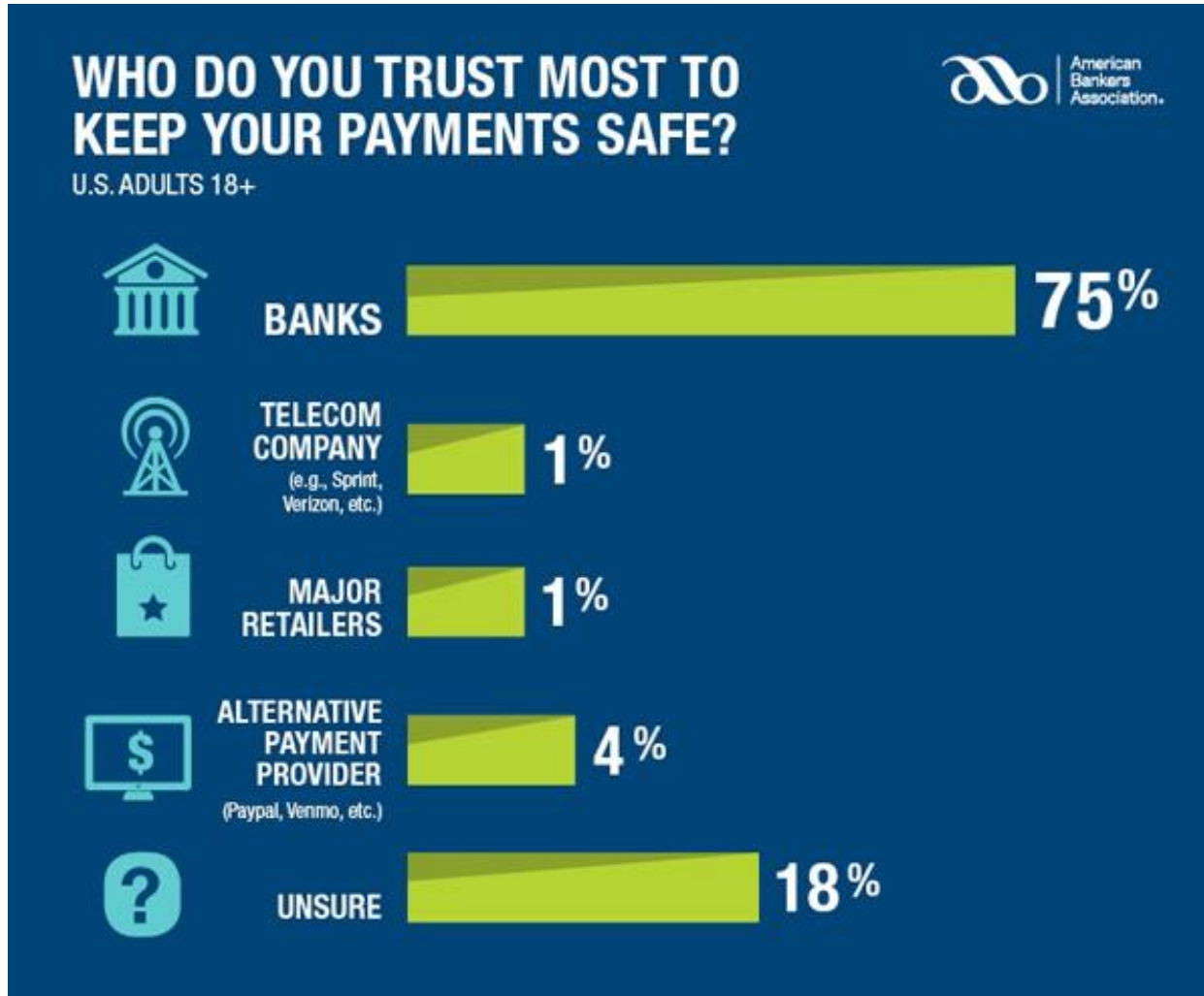| DIGITAL MONEY	ADVANTAGES	DISADVANTAGES
Google Wallet	This app lets people buy goods in stores and online using major credit cards or gift cards. Users earn loyalty rewards and can e-mail money to friends.	Google Wallet can only be used on certain mobile phones. There is a fee to make debit- and credit-card purchases.
CURRENTC	To make a purchase using this free app, customers scan a code with their phone. Discounts are automatically applied. Users earn points toward future purchases.	CurrentC can only be used in certain stores, including Walmart. Payments can only be made using a checking account or certain store credit cards.
coin	This device is about the size of a credit card. It can hold up to eight credit, debit, and gift cards. Users choose the card they want to use with the click of a button.	Coin is not an app on a mobile phone. It is an extra device that users must carry with them.
Pay	This app lets users tap their phone to pay. Users enter credit cards into the app by snapping pictures of them.	Apple Pay users are charged a fee for every purchase. You need an iPhone 6 to use it.

4. Do you think these methods of payment are better than using cash? Explain. _Yes_ because it's easier and cooler.

5. Which method of payment would you recommend to your parents? Explain your choice. _I would recommend Apple Pay because my parents both have iPhone 6's._

BONUS Write a letter persuading a family member to try one type of digital money. Use evidence from the chart to support your argument. Share the letter with your family member. Is he or she convinced? Explain on the back of this page.

Made possible by the **pw**

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March

Should paper money be phased out by 2020? I think it should, and here's why. We're already moving towards getting rid of paper money with technology such as online banking, Apple Pay, and Google wallet. Plus, less of 75 of the U.S.'s money is

...the paper money and coin. And the exact amount of change, or you can't find that one dollar scrunched up in the back of your purse or wallet? I think it would be much easier to just pull out your phone and pay right there instead of going through a huge fiasco. I think it would be easier to pay, and more hassle free if money was completely digitalized by 2020.

Financial Institutions Are Still the Most Trusted When it Comes to Payments

WHO DO YOU TRUST MOST TO KEEP YOUR PAYMENTS SAFE?

U.S. ADULTS 18+

American Bankers Association.

BANKS — 75%

TELECOM COMPANY (e.g., Sprint, Verizon, etc.) — 1%

MAJOR RETAILERS — 1%

ALTERNATIVE PAYMENT PROVIDER (Paypal, Venmo, etc.) — 4%

UNSURE — 18%

Source: ABA Survey by Ipsos Public Affairs, 2015

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Transformation of the Branch

Building The Branch
of the future

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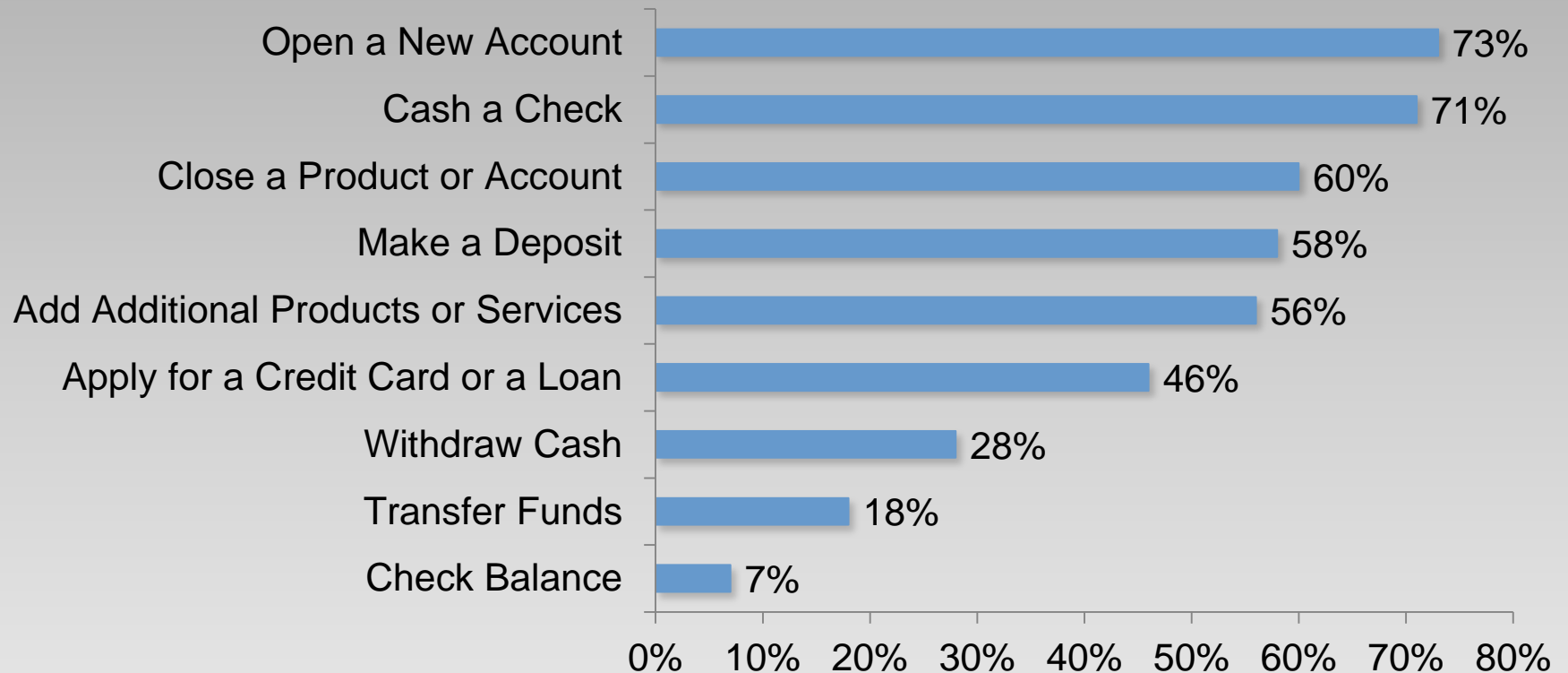
Opening an Account and Cashing a Check are the Most Common Reasons for Visiting a Branch

Financial Activities Customers Prefer to Complete Through Branch Channel, Percent of Global Customers
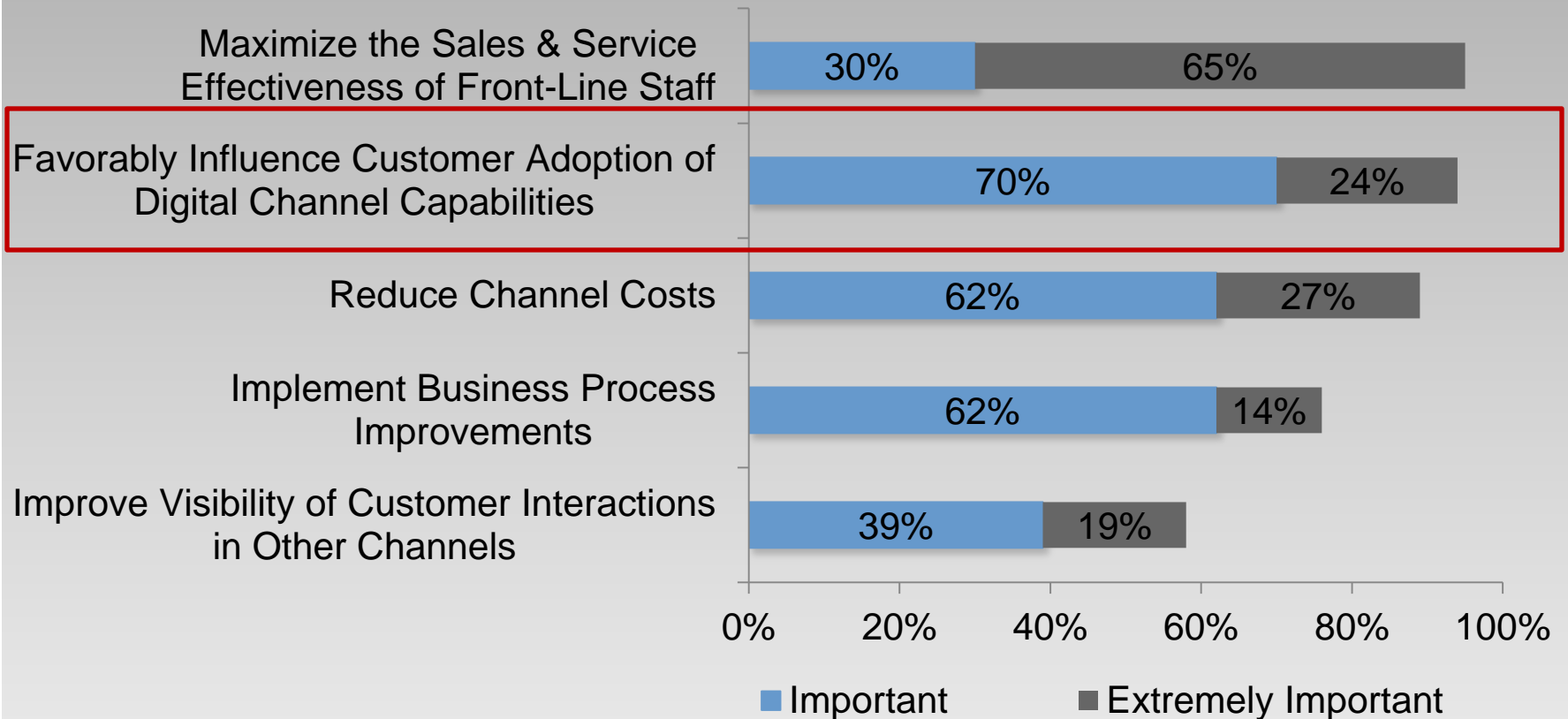
Activity	Percent
Open a New Account	73%
Cash a Check	71%
Close a Product or Account	60%
Make a Deposit	58%
Add Additional Products or Services	56%
Apply for a Credit Card or a Loan	46%
Withdraw Cash	28%
Transfer Funds	18%
Check Balance	7%

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Accelerating Consumer Adoption of Digital Channels is a Key Branch Channel Priority

Most Important Short-Term Branch Channel Priorities

Priority	Important	Extremely Important
Maximize the Sales & Service Effectiveness of Front-Line Staff	30%	65%
Favorably Influence Customer Adoption of Digital Channel Capabilities	70%	24%
Reduce Channel Costs	62%	27%
Implement Business Process Improvements	62%	14%
Improve Visibility of Customer Interactions in Other Channels	39%	19%

0% 20% 40% 60% 80% 100%

■ Important   ■ Extremely Important

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The Branch is Central to Influencing Digital Adoption at Most FIs

Efforts to Influence Digital Channel Adoption
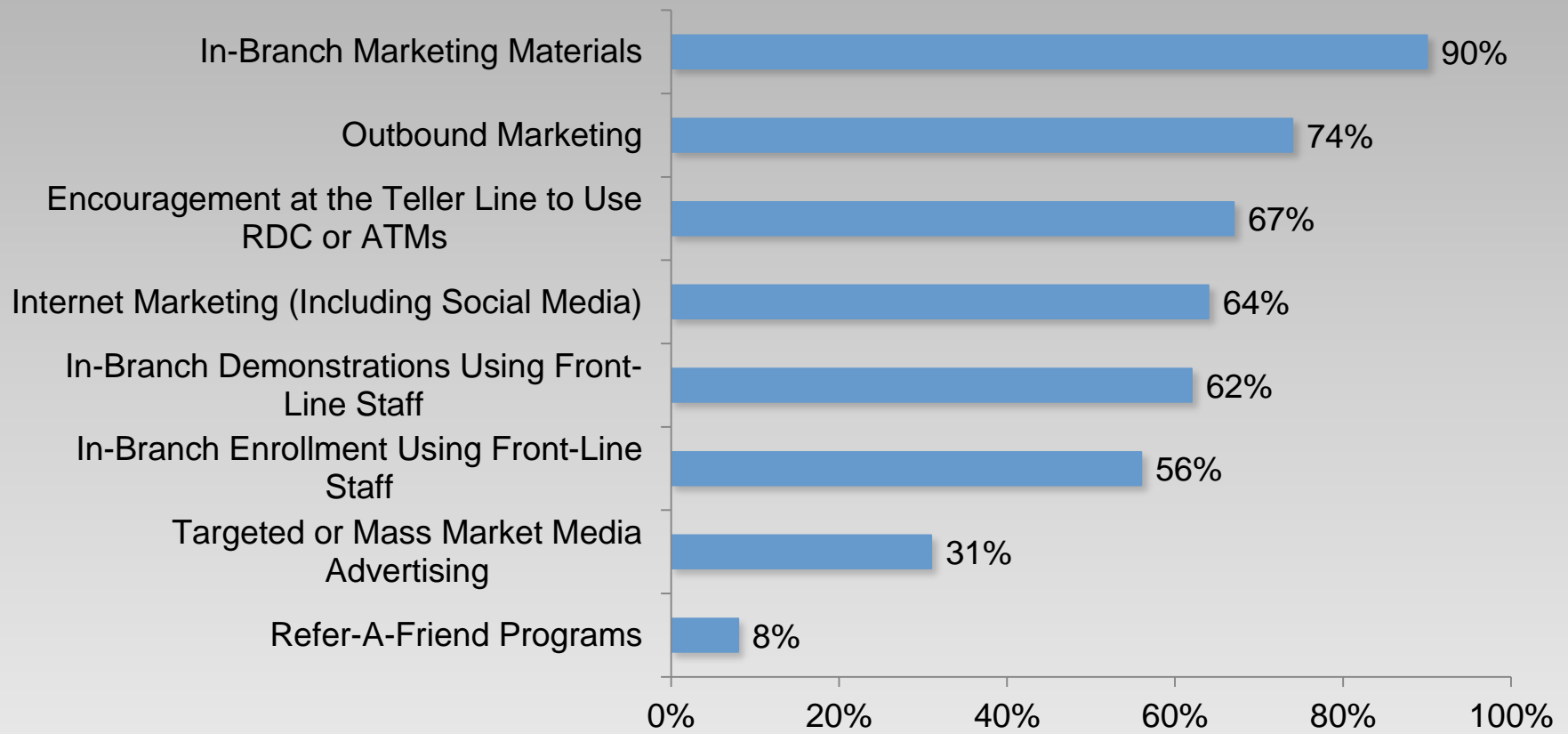
Category	Percentage
In-Branch Marketing Materials	90%
Outbound Marketing	74%
Encouragement at the Teller Line to Use RDC or ATMs	67%
Internet Marketing (Including Social Media)	64%
In-Branch Demonstrations Using Front-Line Staff	62%
In-Branch Enrollment Using Front-Line Staff	56%
Targeted or Mass Market Media Advertising	31%
Refer-A-Friend Programs	8%

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Digital Appointment Booking is a New Feature Offered by Large Banks

Online Appointment Booking Adoption By Asset Tier
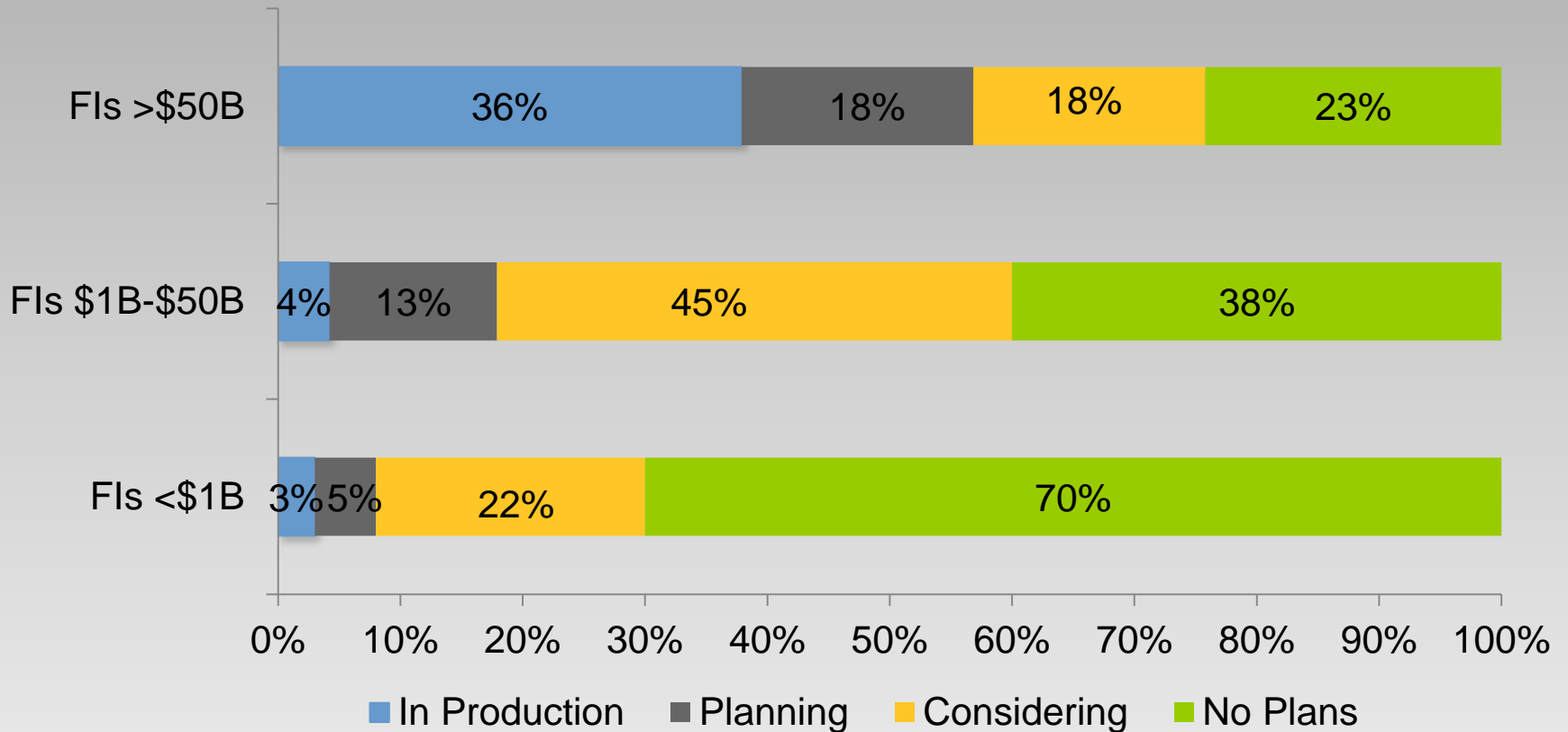
Asset Tier	In Production	Planning	Considering	No Plans
FIs >$50B	36%	18%	18%	23%
FIs $1B-$50B	4%	13%	45%	38%
FIs <$1B	3%	5%	22%	70%

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Branch Still Remains the Top Channel to Purchase Products and Receive Support

Channels Used to Purchase and Receive Support for Financial Products, Percent of Global Customers
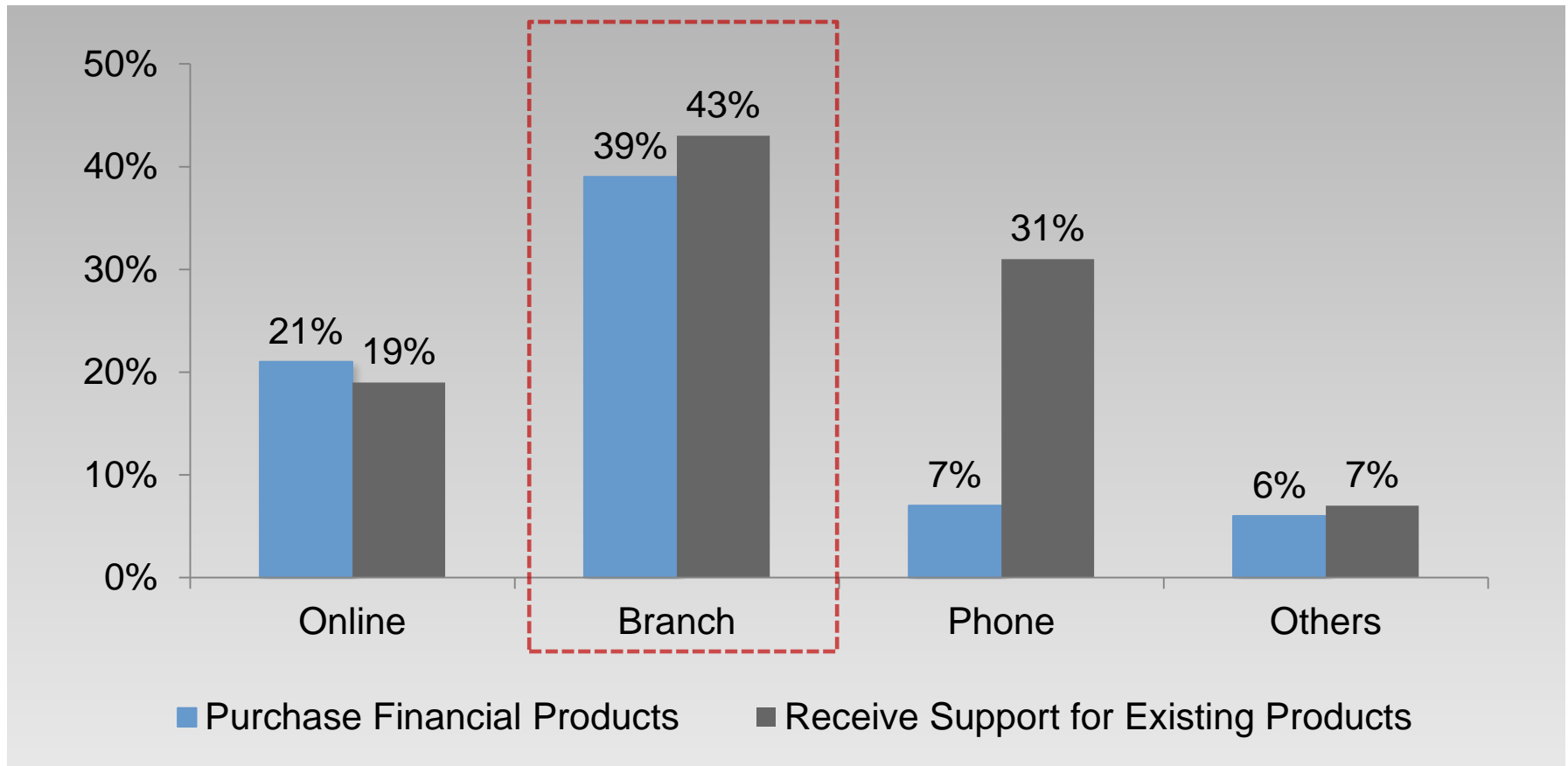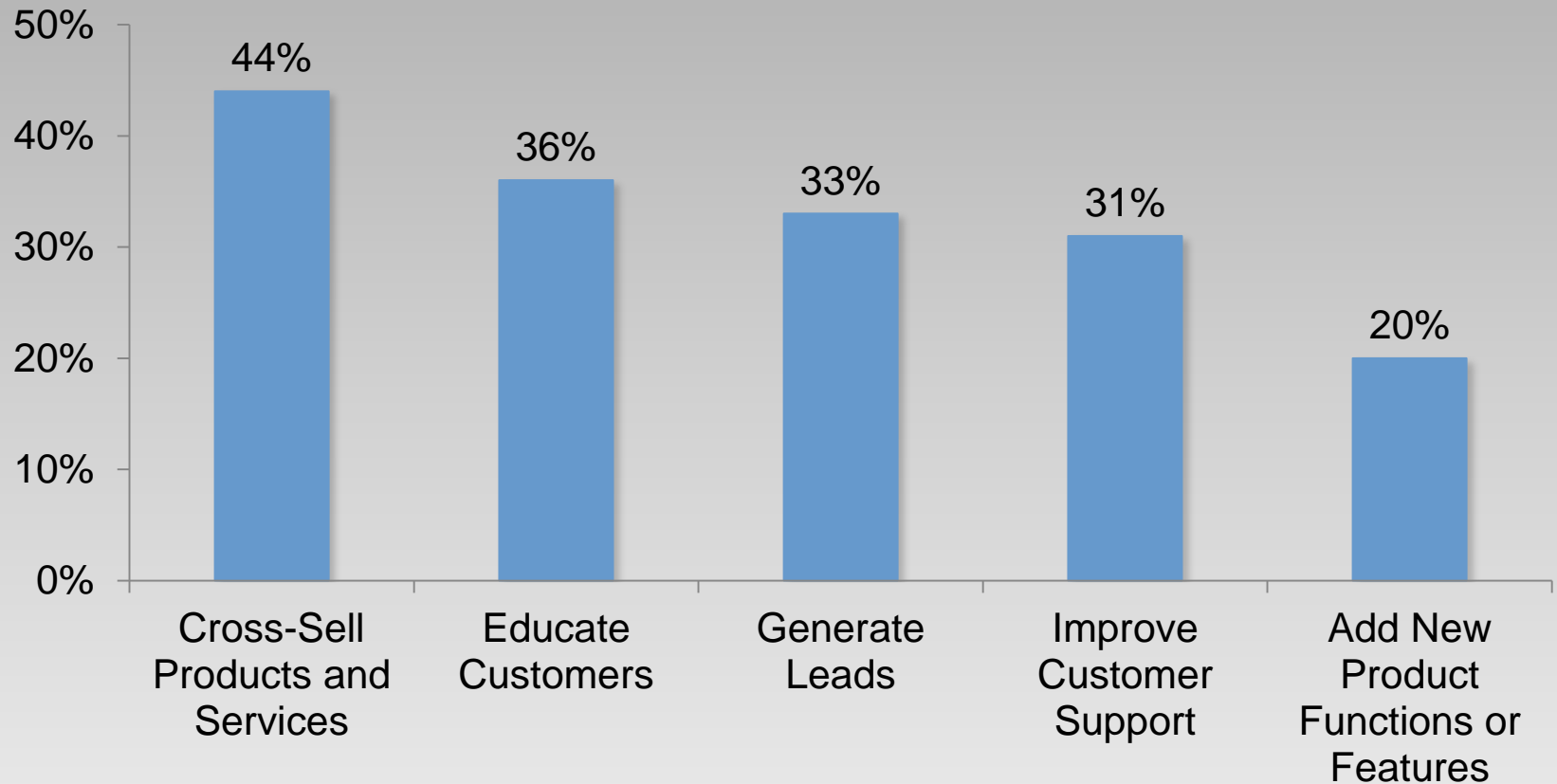

Legend:
- ■ Purchase Financial Products
- ■ Receive Support for Existing Products

Online: 21% / 19%
Branch: 39% / 43%
Phone: 7% / 31%
Others: 6% / 7%

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FI Executives are Investing in Cross-Selling and Educating Customers at the Branch Level

Top Investments in Branch Capabilities, Percentage of Global Retail Banking Executives

Category	Percentage
Cross-Sell Products and Services	44%
Educate Customers	36%
Generate Leads	33%
Improve Customer Support	31%
Add New Product Functions or Features	20%

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Security as a Differentiator

Challenges as Users Move Digital

Cyberattacks Escalating

- Steady stream of malware breaches

- Crime teams increasingly more resourced and agile

- Fraud as a Service

Market Expectations Challenging

- Reducing online user friction always critical

- Delivering advanced Mobile functionality creates risk

- Demanding regulation continues

Non-integrated Security Controls

- Many controls only identify fraud which has occurred

- Collections of point solutions add large ops complexity without effectively reducing risk

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"…what happens is you may wind up with a lot of point solutions that aren't integrated. And I've seen this with lots of our clients over time because they will go out and buy new solutions as the attacks keep evolving."

"So it becomes very difficult to stitch these systems together and make sure they're talking to each other…"

– Avivah Litan, Gartner
September 2014

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Approaches to This Problem

Do it yourself

Third-Party Security Vendor

Financial Services Provider

Design

Integrate

Operate

Keep Pace

forum

Cybersecurity approach must be clearly integrated to business strategy

Need for Big Data & Analytics

What Other Investments are Needed for a Better Digital Experience?

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What is "Big Data"?

The basic idea behind the phrase 'Big Data' is that everything we do is increasingly leaving a digital trace, which we (and others) can use and analyse. Big Data therefore refers to our ability to make use of the ever-increasing volumes of data.

Every 2 days we create as much information as we did from the beginning of time until 2003.

The total amount of data being captured and stored doubles every 1.2 years.

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Understanding the Scale of Big Data

Byte   : one grain of rice

Byte

Understanding the Scale of Big Data

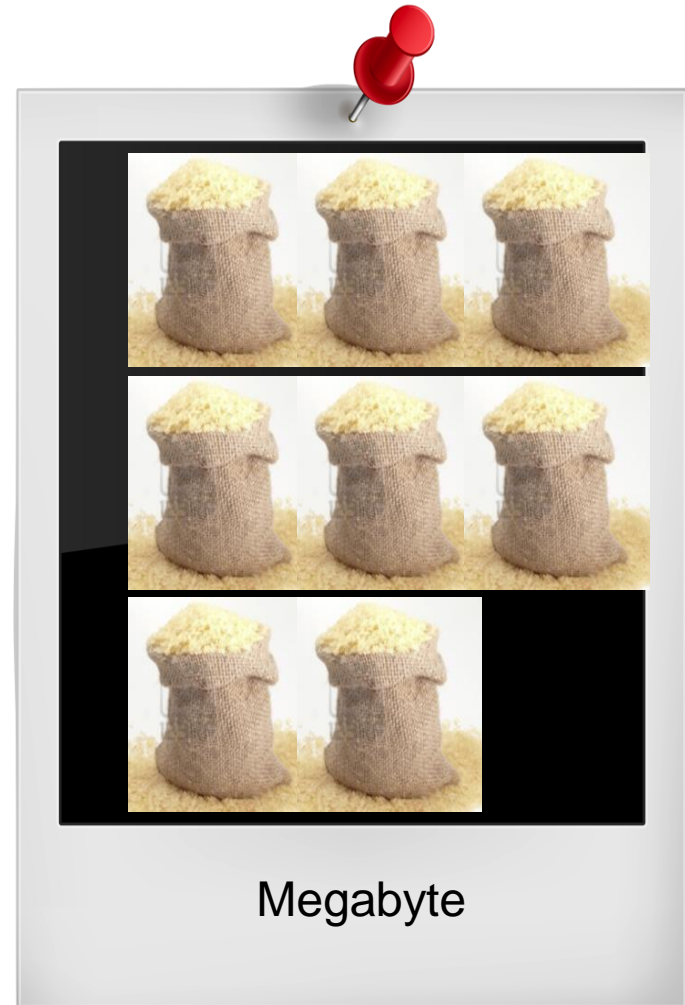Byte   : one grain of rice

Kilobyte   : cup of rice

Kilobyte

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Understanding the Scale of Big Data

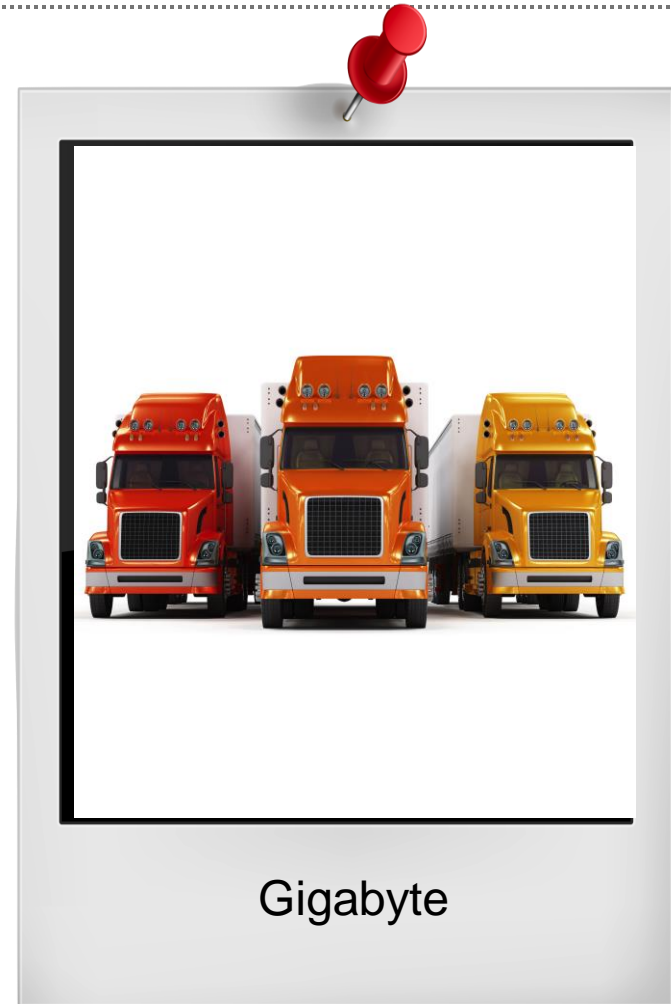Byte : one grain of rice

Kilobyte : cup of rice

Megabyte : 8 bags of rice

Megabyte

Understanding the Scale of Big Data

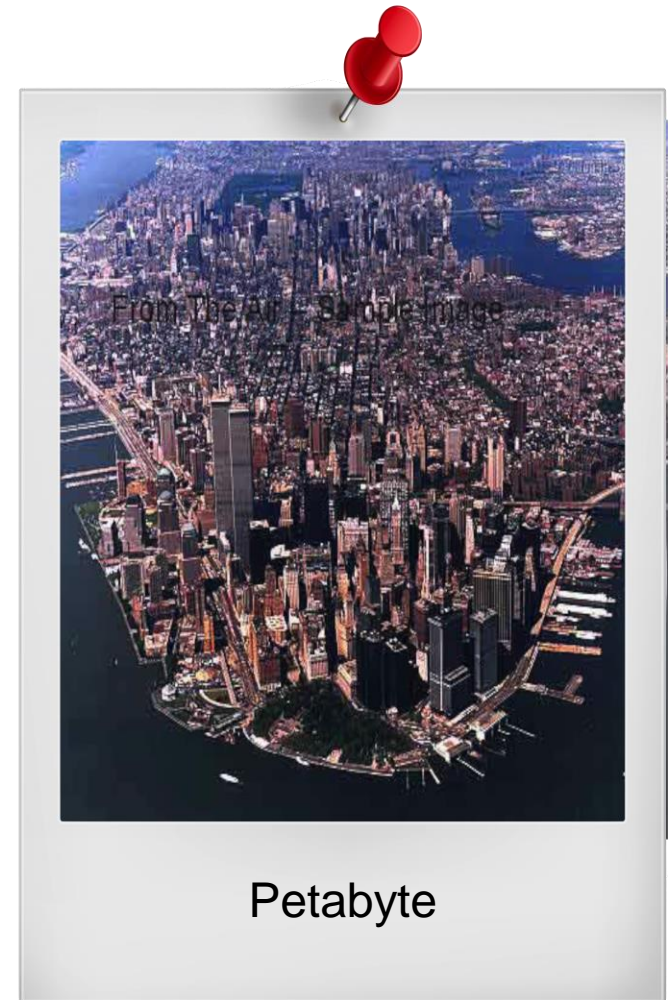Byte : one grain of rice

Kilobyte : cup of rice

Megabyte : 8 bags of rice

Gigabyte : 3 Semi trucks

Gigabyte

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Understanding the Scale of Big Data
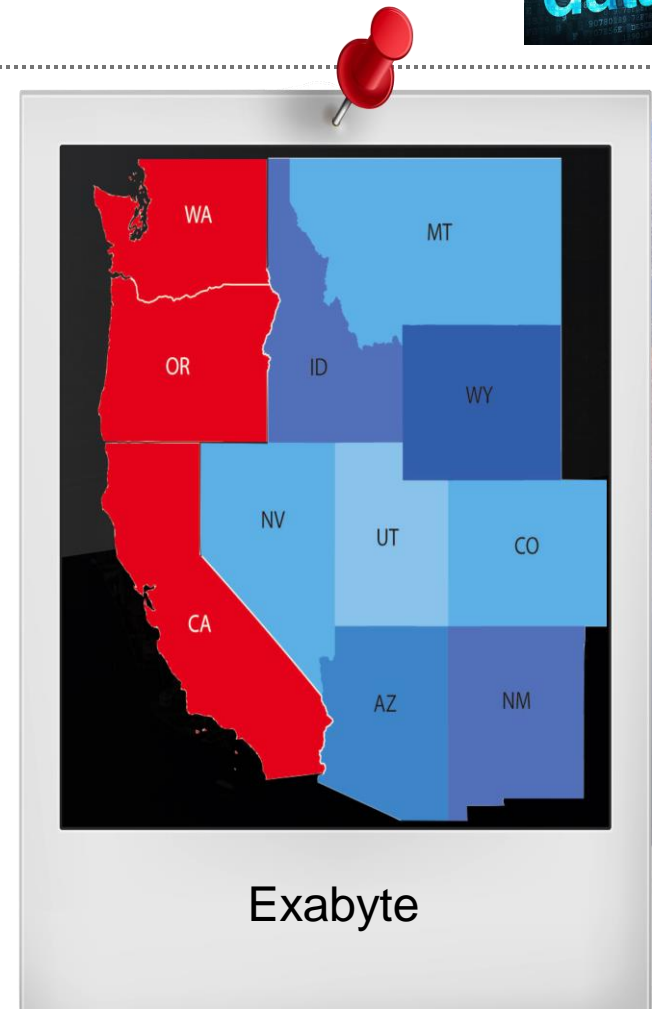
Byte : one grain of rice

Kilobyte : cup of rice

Megabyte : 8 bags of rice

Gigabyte : 3 Semi trucks

Terabyte : 2 Container Ships

Terabyte

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Understanding the Scale of Big Data

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Petabyte : Blankets Manhattan

From The Air - Sample Image

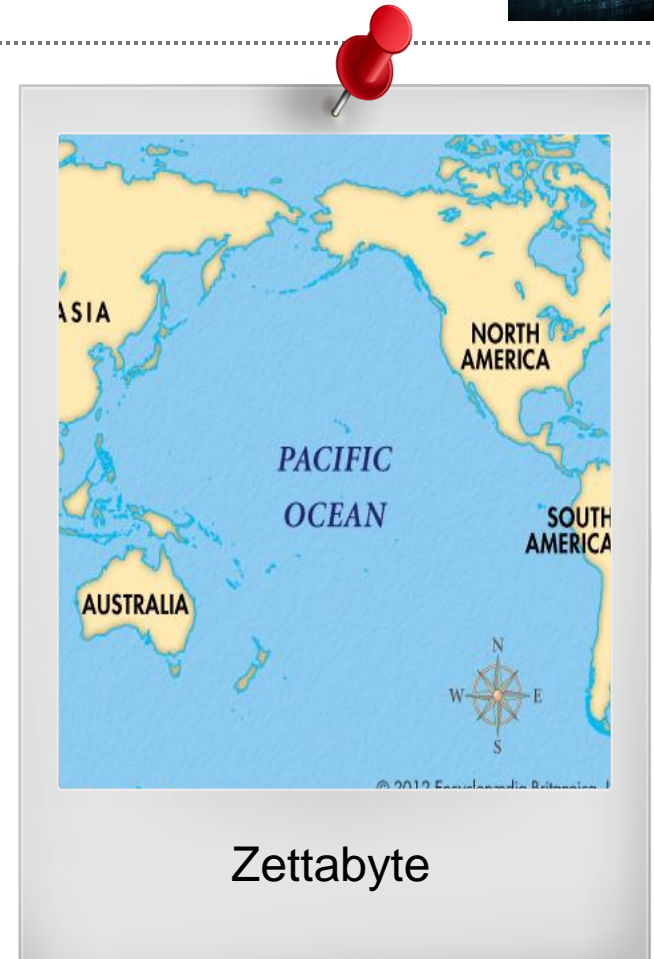Petabyte

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Terabyte   : 2 Container Ships

Petabyte   : Blankets Manhattan

Exabyte   : Blankets west coast states

Exabyte

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Exabyte : Blankets west coast states

Zettabyte : Fills the Pacific Ocean

TECHNOLOGY

BIG IDEA: YEAR OF THE ZETTABYTE

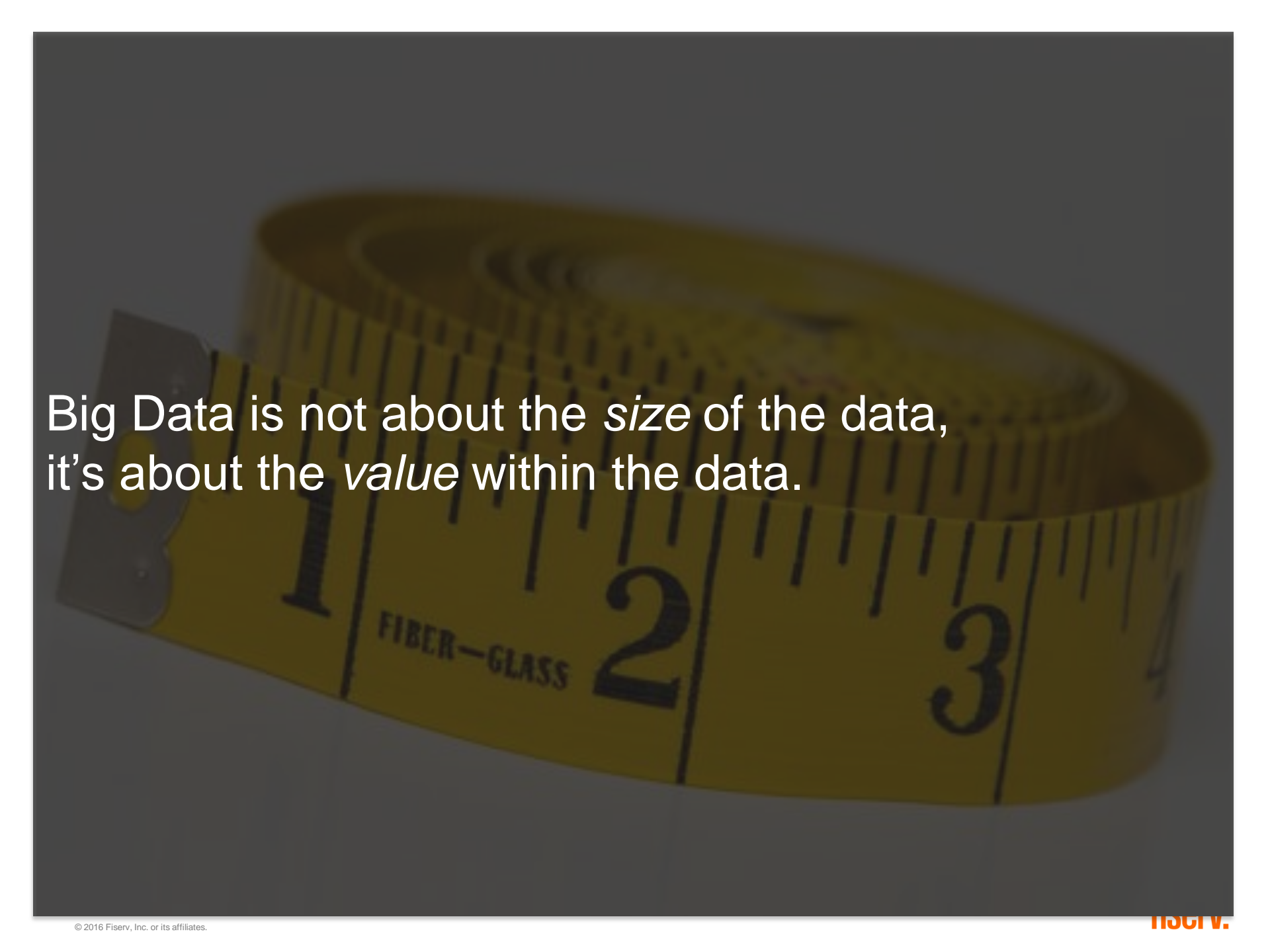ARE WE PREPARED FOR 2016'S DATA DELUGE?

Zettabyte

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Understanding the Scale of Big Data

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Exabyte : Blankets west coast states

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Yottabyte : A EARTH SIZE RICE BALL!
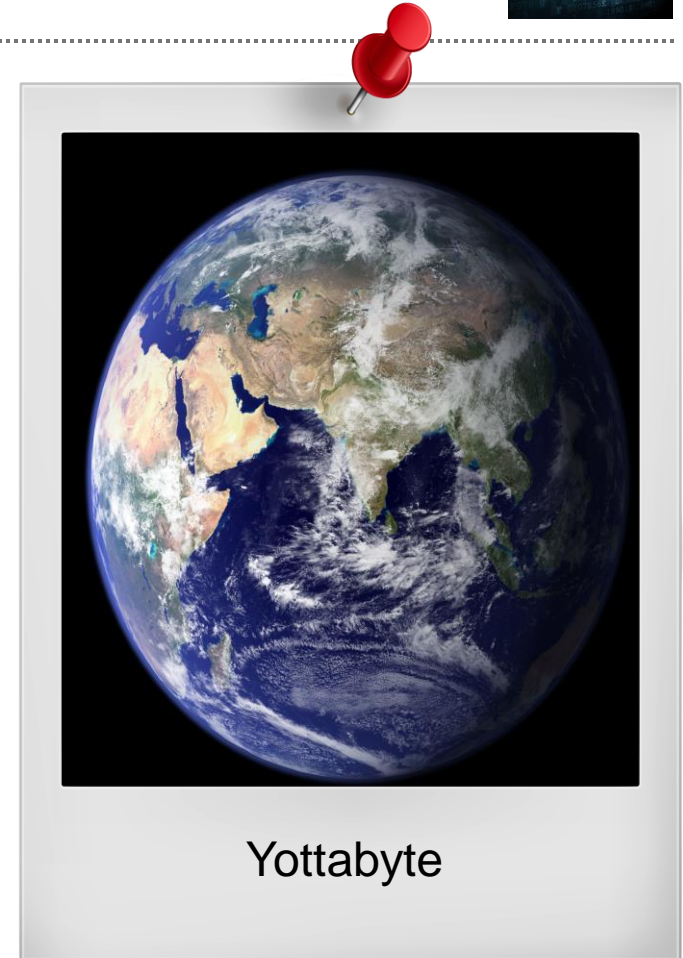
Yottabyte

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Big Data is not about the *size* of the data, it's about the *value* within the data.

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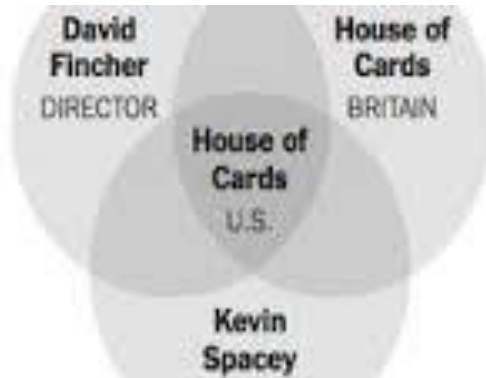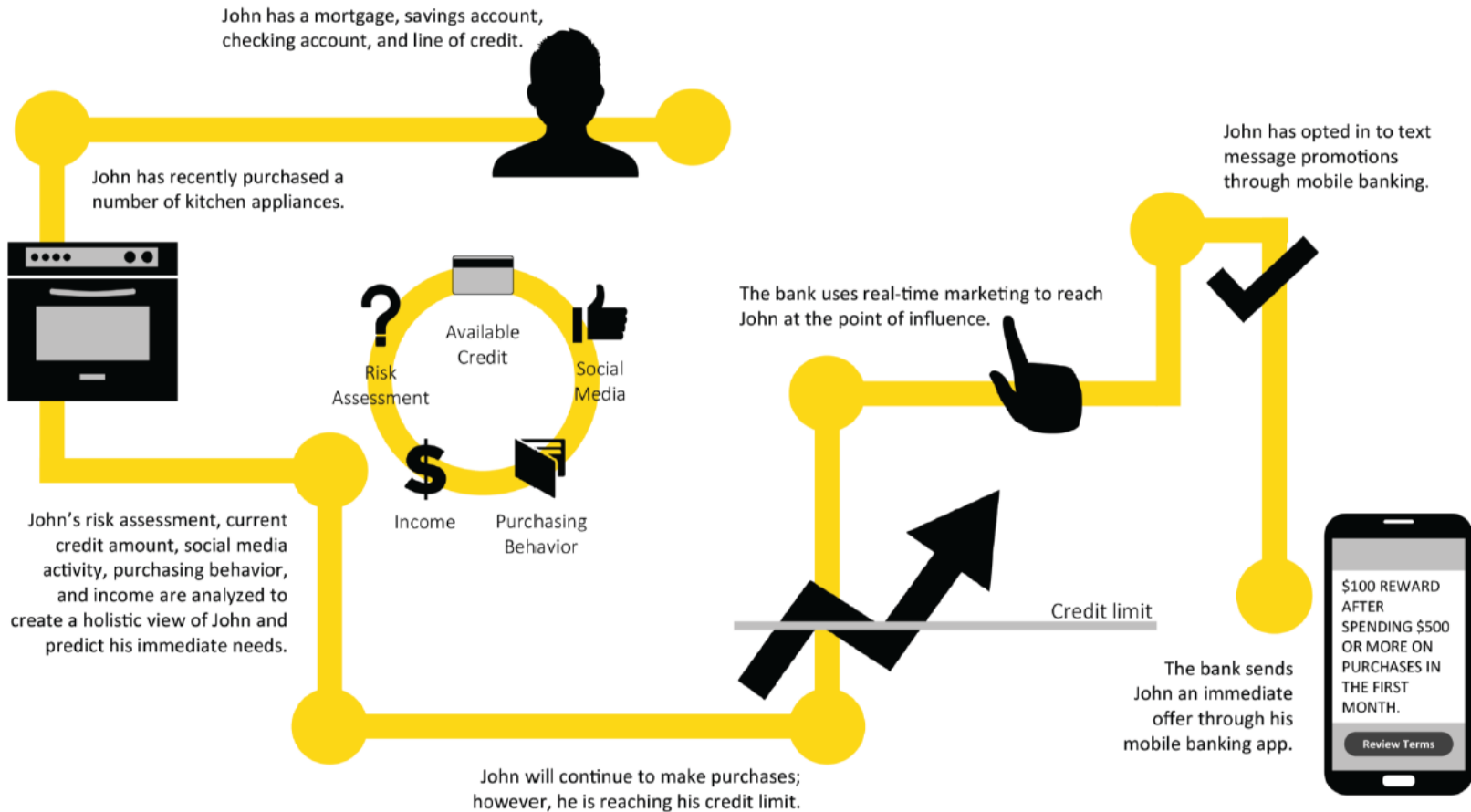# Big Data: The Netflix Formula for Original Programming: *House of Cards*

Before green-lighting *House of Cards*, Netflix knew:

- A lot of users watched the David Fincher directed movie *The Social Network* from beginning to end.
- The British version of "*House of Cards*" has been well watched.
- Those who watched the British version "*House of Cards*" also watched Kevin Spacey films and/or films directed by David Fincher.

Big Data: Financial Services Example

John has a mortgage, savings account, checking account, and line of credit.

John has recently purchased a number of kitchen appliances.

John has opted in to text message promotions through mobile banking.

Available Credit
Risk Assessment
Social Media
Income
Purchasing Behavior

John's risk assessment, current credit amount, social media activity, purchasing behavior, and income are analyzed to create a holistic view of John and predict his immediate needs.

The bank uses real-time marketing to reach John at the point of influence.

Credit limit

John will continue to make purchases; however, he is reaching his credit limit.

The bank sends John an immediate offer through his mobile banking app.

$100 REWARD AFTER SPENDING $500 OR MORE ON PURCHASES IN THE FIRST MONTH.

Review Terms

Source: Demo: IBM Big Data and Analytics at work in Banking
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Financial Services in the Future

"I can't help you with that. You'll have to speak to one of our ATMs."

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Questions and Discussion
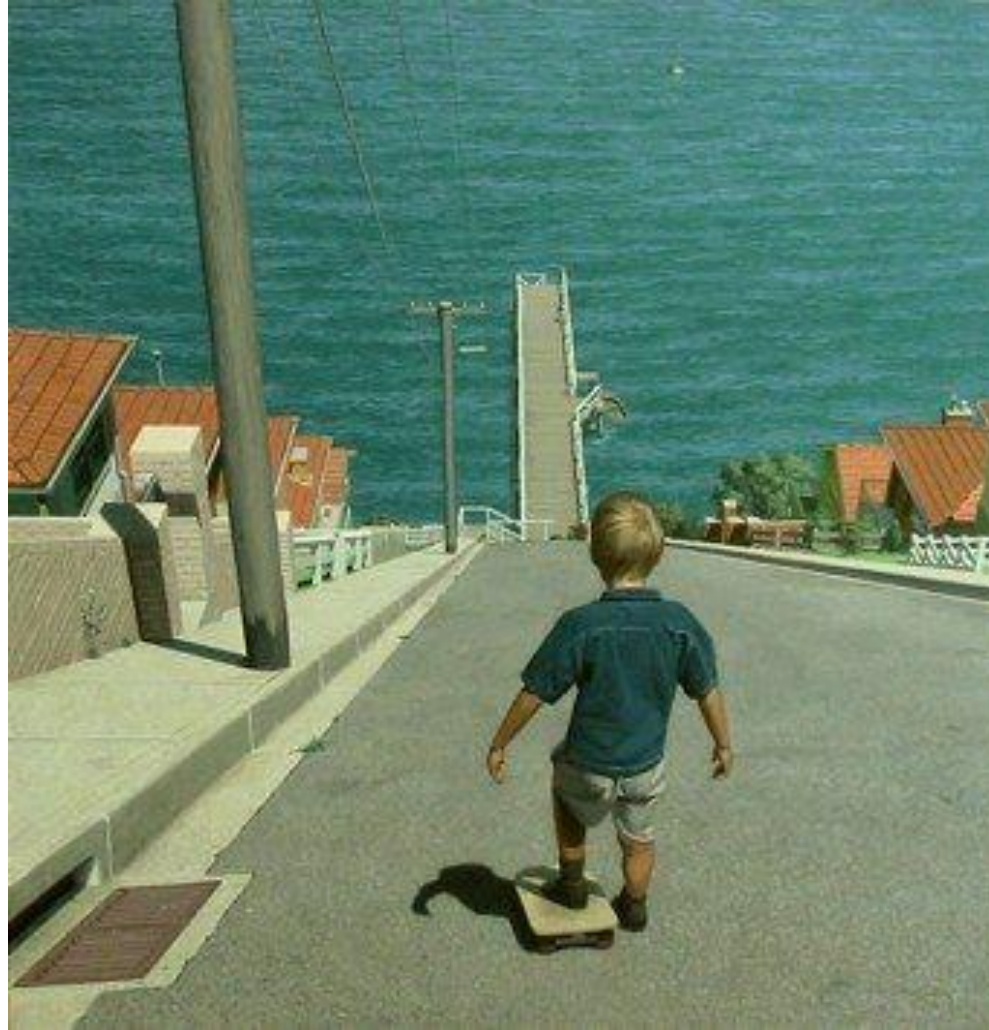
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forum