



# U.S. Bank Case Study

**Beth Gallagher**

Vice President, Payments Innovation

*May 14, 2014*

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# U.S. Bank Payments Innovation

Who are we?



# U.S. Bank – 2014 1<sup>st</sup> Quarter Statistics

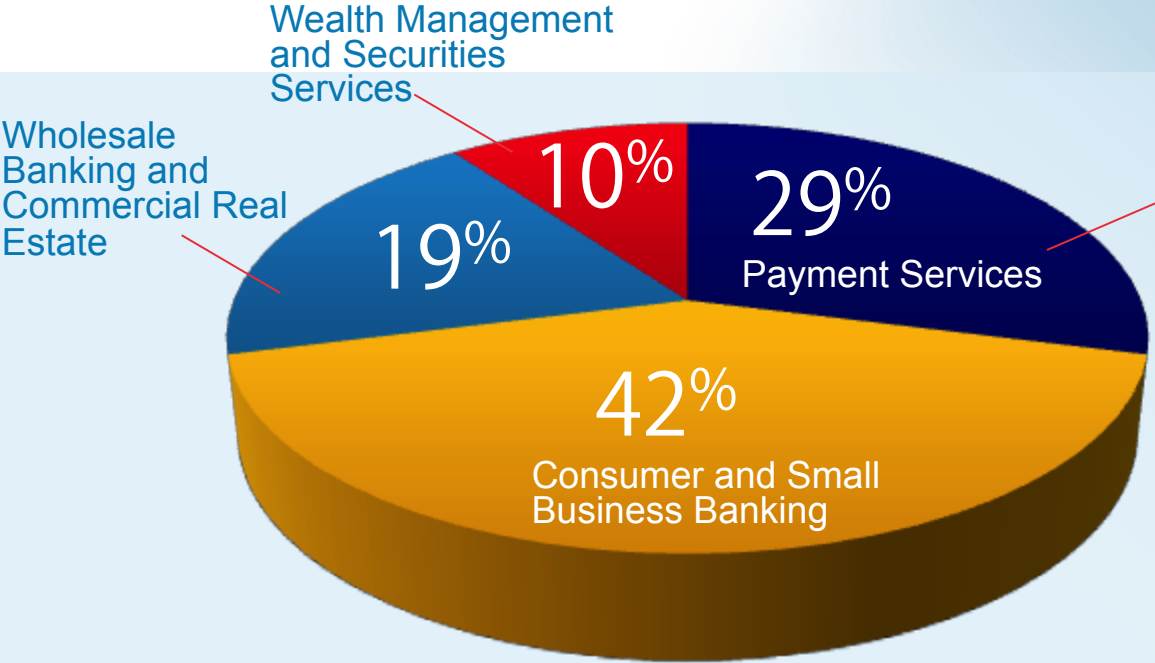
- Headquartered in Minneapolis, MN

Ranking	U.S. Bank is 5th largest U.S. commercial bank
Period-end assets	\$371 billion
Period-end deposits	\$261 billion
Period-end loans	\$238 billion
Customers	17.9 million
Bank branches	3,083
ATMs	4,878
NYSE symbol	USB

As of April 17, 2014



# Revenue Mix



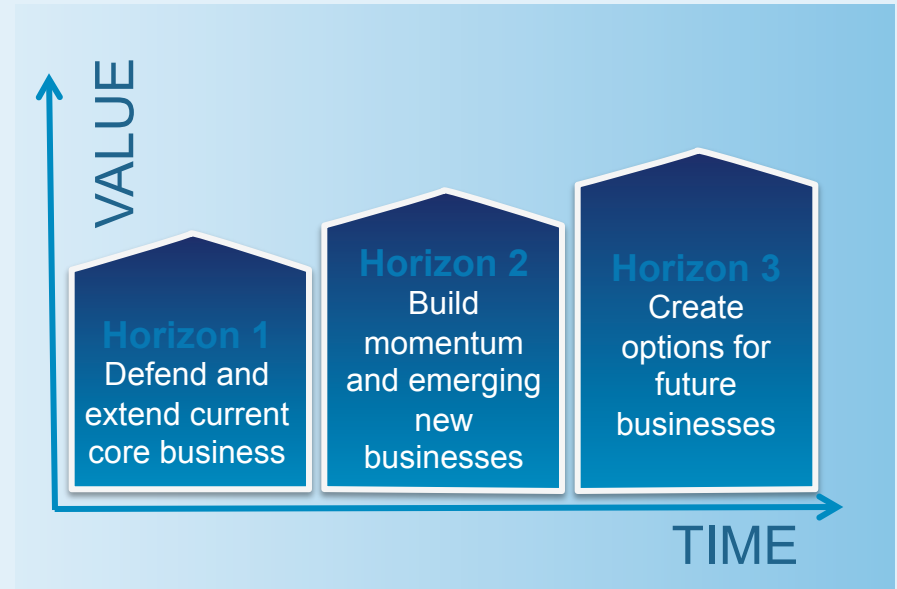
1Q14 taxable-equivalent basis. Excluding securities gains (losses) net Revenue percentages exclude Treasury and Corporate support



# Payments Innovation Mission

To discover, test, and assist in commercialization of new payment solutions:

- Support Payments business lines in emerging technology adoption for Horizon One businesses
- Seed new Horizon Two and Three revenue streams
- Mobile Center of Excellence to develop leading mobile solutions across Payments businesses
- Incubate and grow emerging Payments businesses



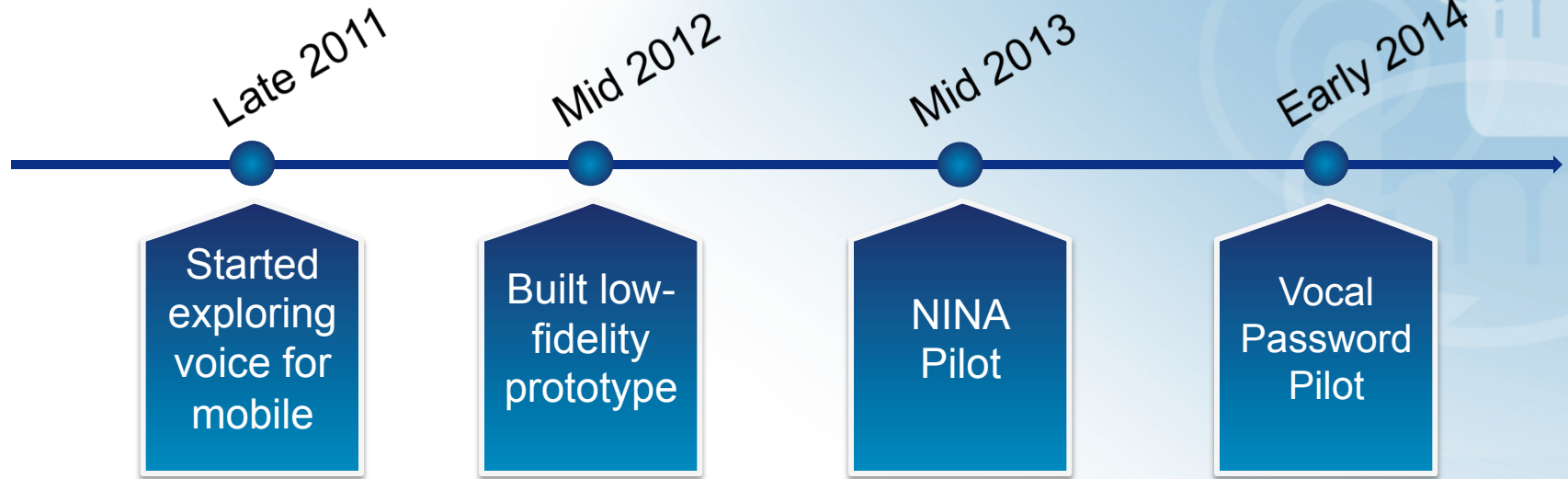
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# Background

Why biometrics?



# Our Work with Voice







# Why Biometrics

- We have too many passwords
- 61% of consumers reuse passwords\*
- Password requirements make login via mobile very complex
- 85% of consumers experience frustration with the existing authentication process\*\*
- Biometrics don't require the consumer to remember anything
- Opportunity to provide a better user experience

\*Forrester Consulting on behalf of SecureKey Technologies, September 2013

\*\*Coleman Parkes Research, 2012



# Benefits of Voice Biometrics

- Voice is one of the easier forms of biometrics for consumers
- Mobile phones are already equipped with microphones
- Consumers are more willing to provide a voiceprint than they are to provide another form of biometric
- Voiceprints are stored as data files using a unique key rendering them useless to fraudsters
- Voice is easy to integrate and easy to maintain



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# Getting to Pilot

How it got done



# Internal Buy-In

- Partnered with Information Security Services early on
- Presented to senior leadership within Payment Services
- Worked through Corporate Risk Management's Business Change Inventory process
- Discussions with Legal
- Maintained open communication with the Mobile Channel team



# Data Collection

## Background Model

- Collect voices to build a baseline background model for the verification engine

## True User/Imposter Test (TUIT)

- Controlled test to determine the False Accept & False Reject metrics
- Nuance performed the tuning and calibration to determine the equal error rate to be used during the pilot

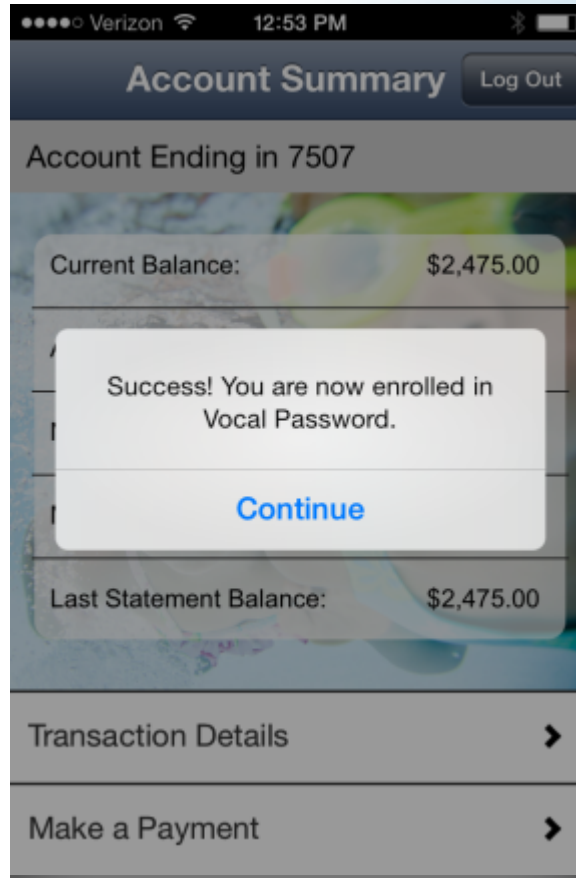


# Mobile Banking Platform

- Used a platform designed specifically for credit card access
- Integrated the Vocal Password API into one app on the platform
- Added the authentication process to the login flow
- No other modifications were made to the app



# Enroll



# Log In

Account Summary		Log Out
Account Ending in 7507		
Current Balance:	\$2,475.00	
Available Credit:	\$2,525.00	
Next Payment Due:	02/17/2014	
Minimum Payment Due:	\$30.00	
Last Statement Balance:	\$2,475.00	
Transaction Details		>
Make a Payment		>





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# Pilot Goals

What did we want to learn?



# Learning Objectives

- Test the accuracy of using voice biometrics to authenticate into the mobile app
- Understand if voice biometrics is a viable solution to authentication into the mobile environment
- Evaluate the user experience of using a vocal password in place of typing a password into the app
- Understand perceived benefits or drawbacks to using a vocal passphrase from the user perspective



# Quantitative Measurement

There are two primary types of quantitative measurement:

- True User Testing
  - 45 day pilot focused only on the true user rate
  - Measured quantitatively through reporting from the Vocal Password software
- Imposter Testing
  - Nuance performed the imposter testing in their environment
  - We provided the data packages of the voiceprints for this test



# Qualitative Measurement

- Participants completed two surveys
  - Enrollment survey
  - End-of-pilot survey
- Success was defined as:
  - Users having an overall positive experience using voice
  - Perceived level of security being the same as or greater than typing a password
  - Log in time shorter than or the same as typing a password



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# Quantitative Results

How well did it work?



# True User & Imposter Measurements

- 2% of the total sessions were False Rejects
- We experienced no instances of False Accept
- Several rejected authentications were due to intentional behavior on the part of the user



# Other Reasons for Rejected Authentication

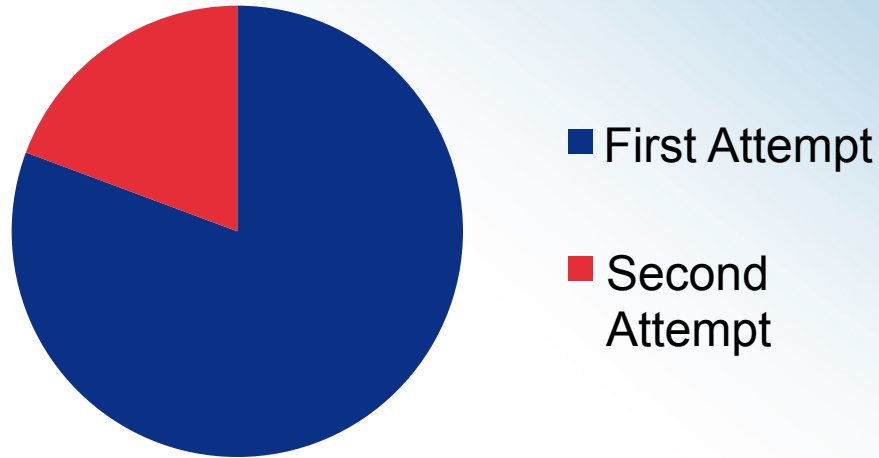
Attempts were also rejected for known reasons such as:

- Playback detection
- Caller speaking too quickly
- Audio cut off
- Audio too noisy
- Audio too quiet
- Incorrect Passphrase



# Authenticated Logins

- 88% of total sessions authenticated the user on either the first or second attempt





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# Qualitative Results

What did people think?



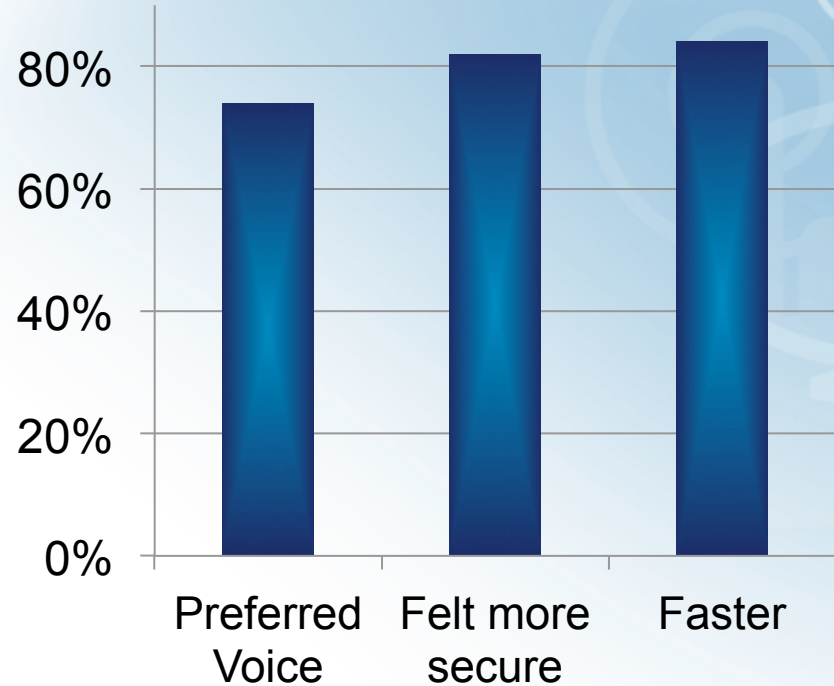
# Enrollment

- On a scale from 1-5, users rated the enrollment experience 4.42
- The majority of users were able to successfully enroll on the first attempt
- Users felt the process was easy and intuitive



# User Feedback

- Users rated the ease of log in by voice as 4.24 on a scale from 1-5



# User Comments

“I feel like the app knows it’s me”

“I choose long and difficult passwords, and sometimes I fat finger my password and have to start over”

“It kind of scares me that someone might be able to sound like me and get into my account”

- “Can’t duplicate my voice; always possible to decode a password”



# User Experience

- Some users were uncomfortable using voice in a public setting where others could overhear them
  - Main reason – they felt “silly”
  - Secondary reason – thought someone may be able to record their voice and use it to log in
- Several users stated that it didn’t work for them in noisy environments



# Mobile Banking Use

- 97% of pilot users use the U.S. Bank Mobile Banking app

## Frequency of Use



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# Future

The way forward



# What's Next?

- Pilot results have been shared across the organization
- Several business lines are evaluating the opportunity and determining where it makes the most sense to implement
- Working through the business case at the enterprise level







# Questions

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