

# BehaviorSec

Behavioral Biometrics – why choose between user experience and security when you can have both?

Dr. Neil Costigan, CEO  
ncostigan@behaviorsec.com

**FAST COMPANY**  
3RD MOST INNOVATIVE COMPANIES OF 2015 IN MONEY

**Gartner** 2012  
**CoolVendor**

The  
**FinTech50**  
2016

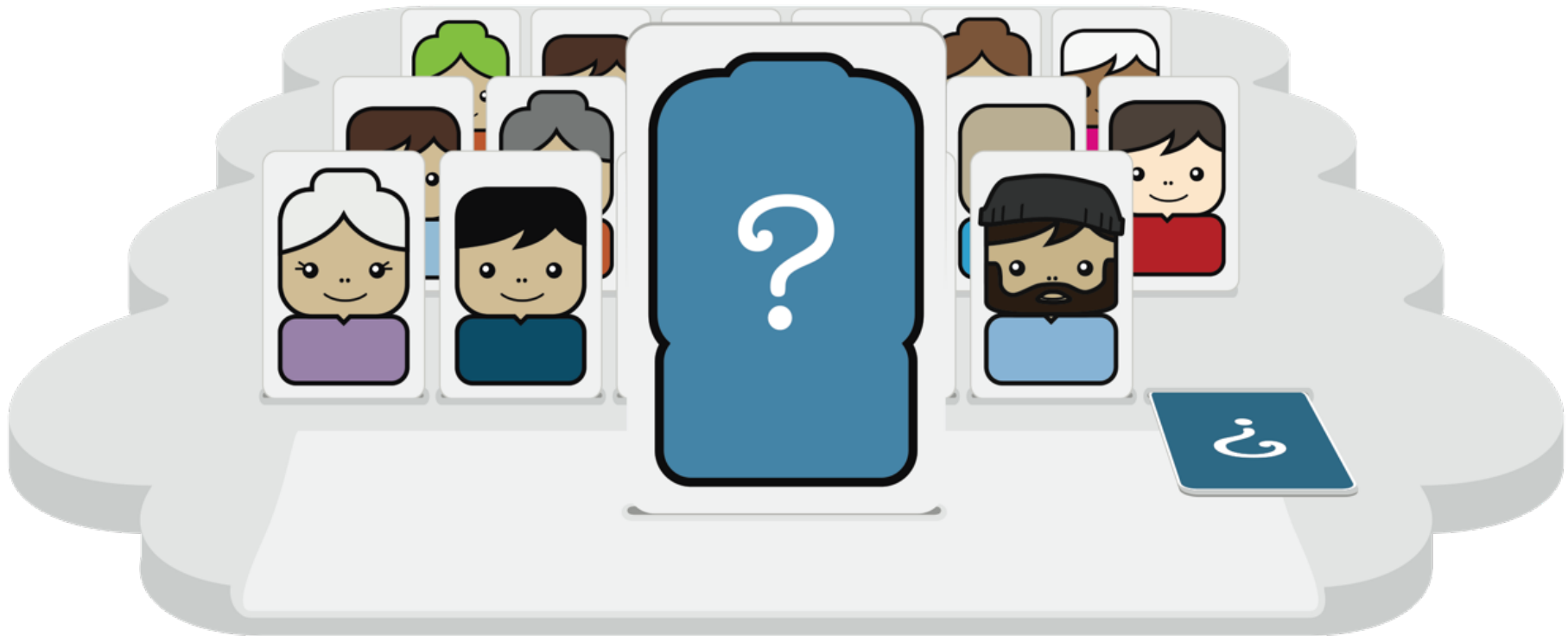


BEST OF SHOW 2014 EUROPE  
BEST OF SHOW 2012 US  
BEST OF SHOW 2013 ASIA

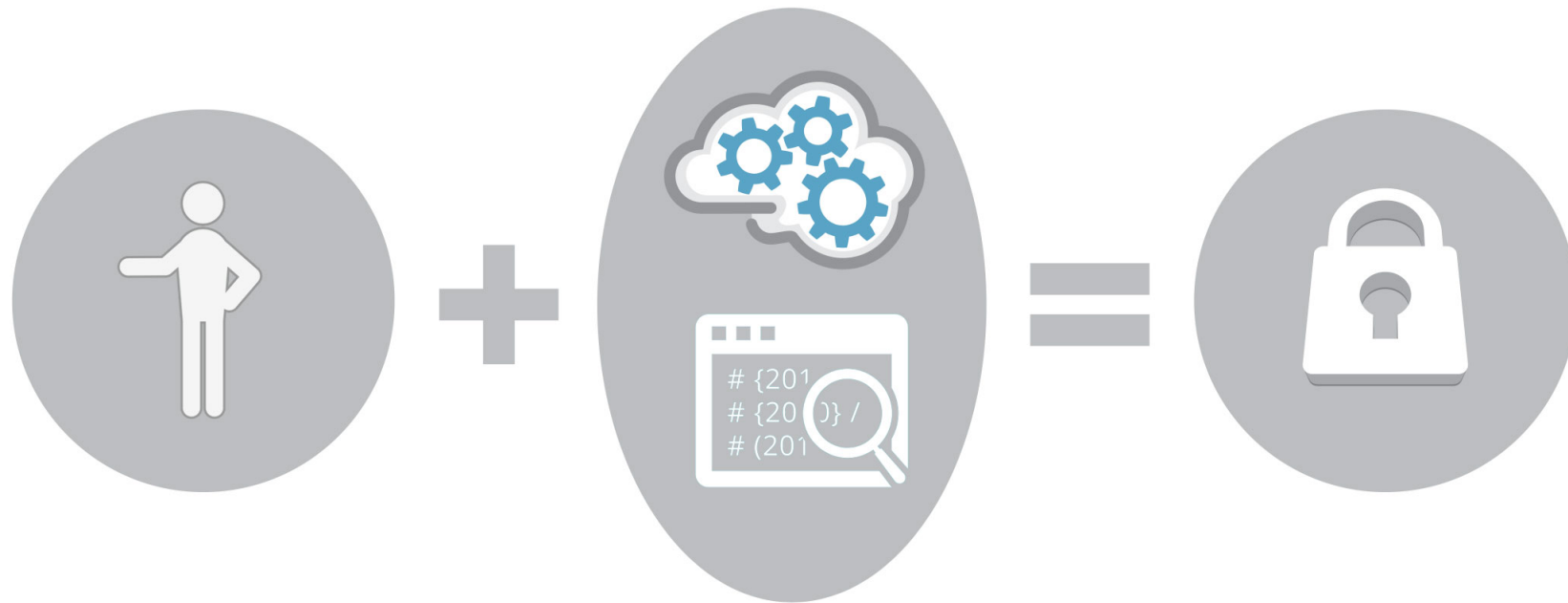
 **FINDEV R**  
BEST OF SHOW 2014

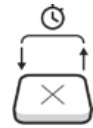
**WIRED.CO.UK**  
EUROPE'S HOTTEST STARTUPS 2014: STOCKHOLM

Minimize risk AND maximize UX

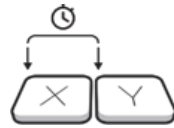


# Behavioral Biometrics

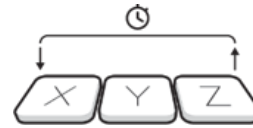




PRESS



FLIGHT



SEQUENCE



MOUSE

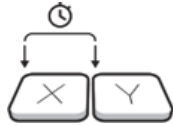
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## Behavior according to us

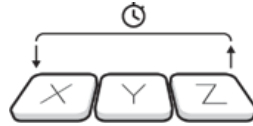
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PRESS



FLIGHT



SEQUENCE

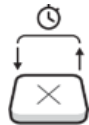
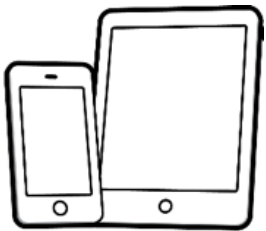


MOUSE

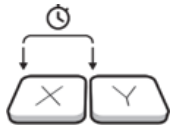
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## Behavior according to us

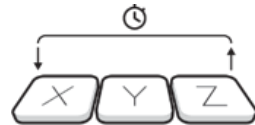
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PRESS



FLIGHT



SEQUENCE



SURFACE



GYROSCOPE



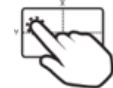
ACCELEROMETER



PRESSURE



MOTION



HIT ZONE

# Concept



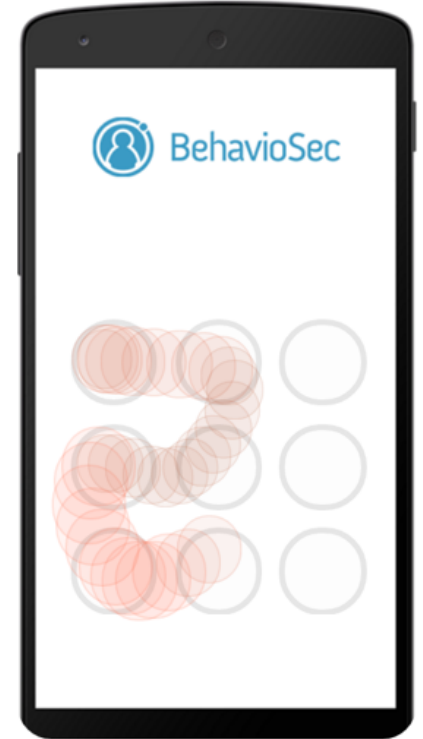
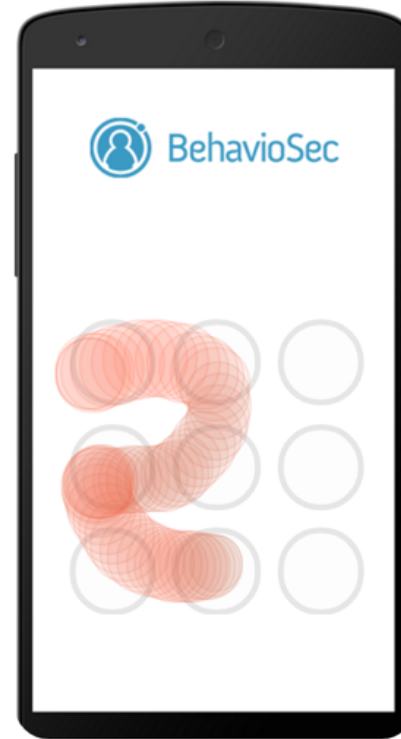
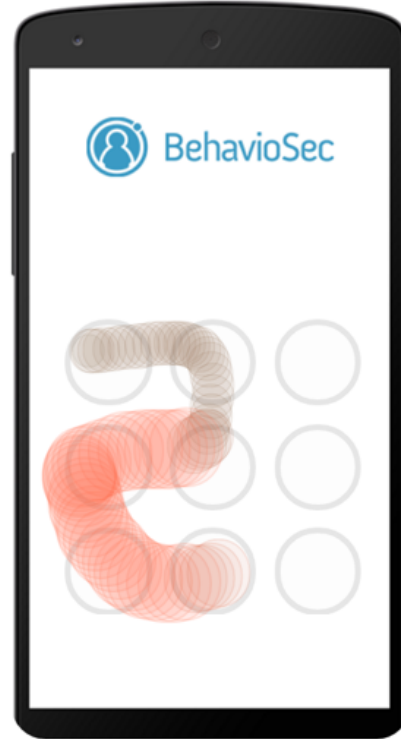
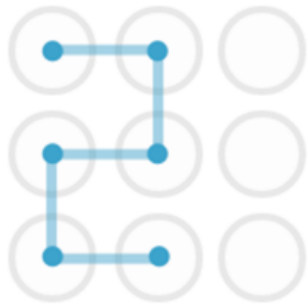
Johanna



Tony



Peder





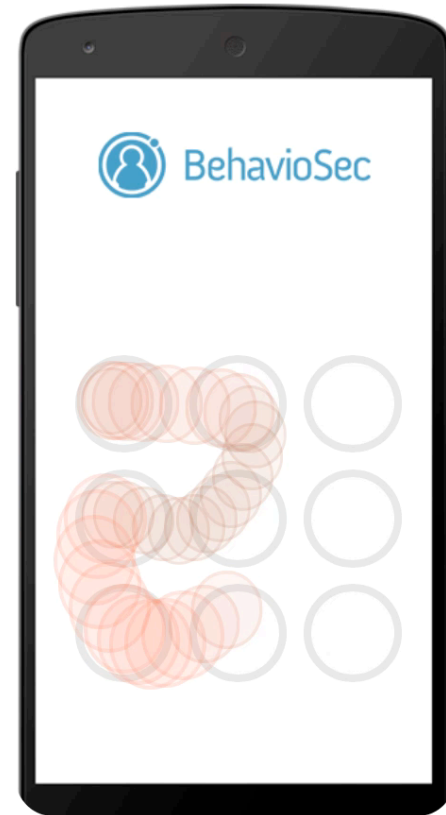
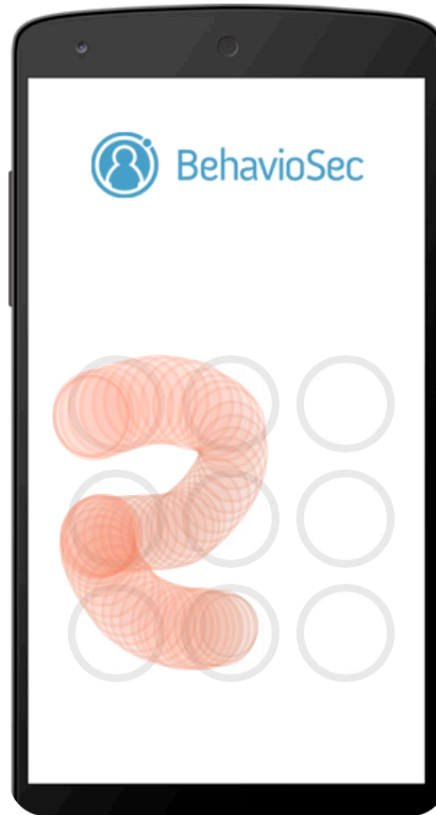
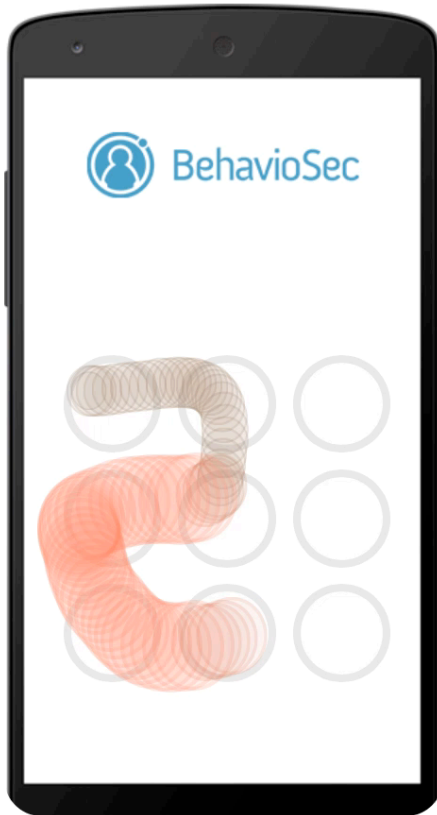
Johanna



Tony



Peder



# How it works



COLLECT  
behaviour data

ANALYZE  
real time

RATE  
intelligence



# Continuously.



Transparent. Dynamic. Adaptive.

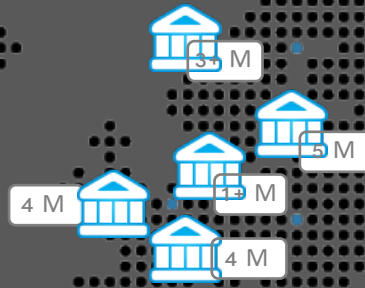


Continuous User Friendly Security

2014



2015



1,2B

Transactions/year

2016



est. 4B+  
Transactions/year

# Business reasons



## Risk & Fraud

Minimize fraud

Dynamic risk assessment

Continuous protection

Adaptive ML fraud analysis



## Enhanced UX

Passive user verification

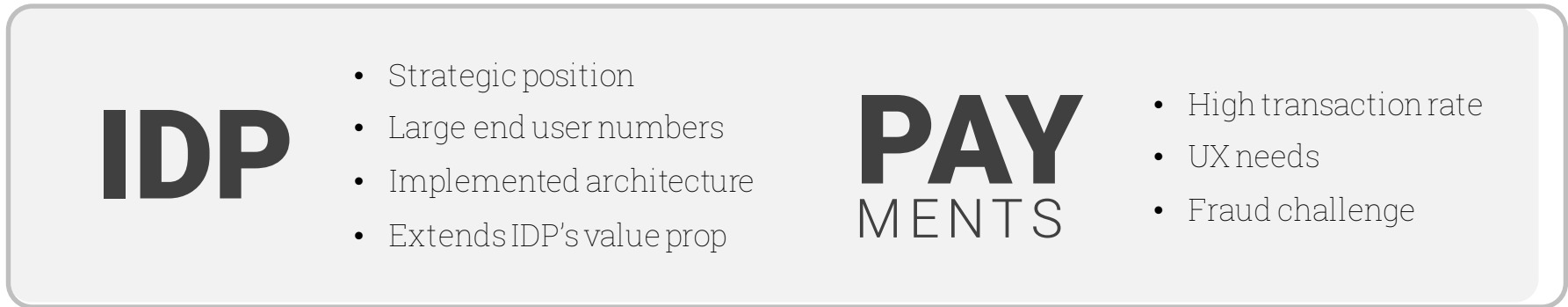
Sophisticated data gathering

Designed for layered security

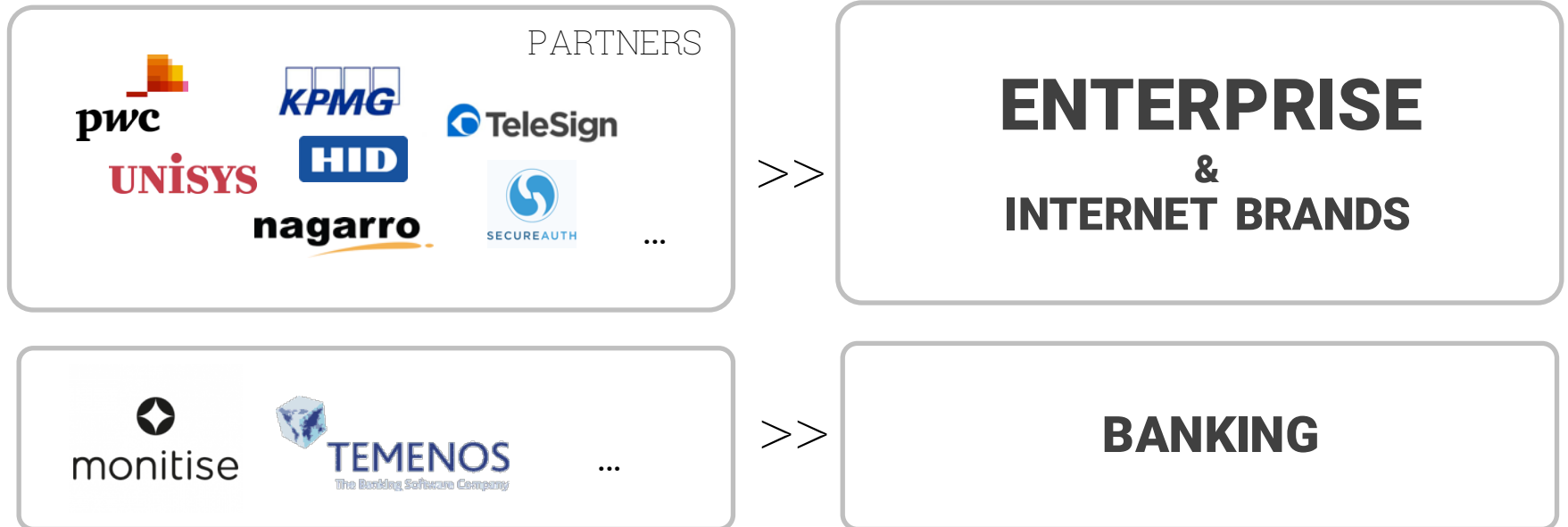
Better user journey

# Growth areas

Direct



Channel



# The unknown unknown, © by Donald Rumsfeld

- Problem with real life data
  - „On the Internet, nobody knows you're a dog.“
- To fully test the system, controlled trials are a MUST
- Try to get as close as possible to the real world data
  - Use the same app
  - Same devices
  - Blind tests
  - Let test users attack each other
  - Or, if the same thing have been written, synthetic cross attacks can be made



*"On the Internet, nobody knows you're a dog."*



# Controlled dataset

- Like always, good statistics need much data, but much good data is hard to get.
- Good enough:
  - About 100 users
  - 30 samples each

# Performance of native mobile application

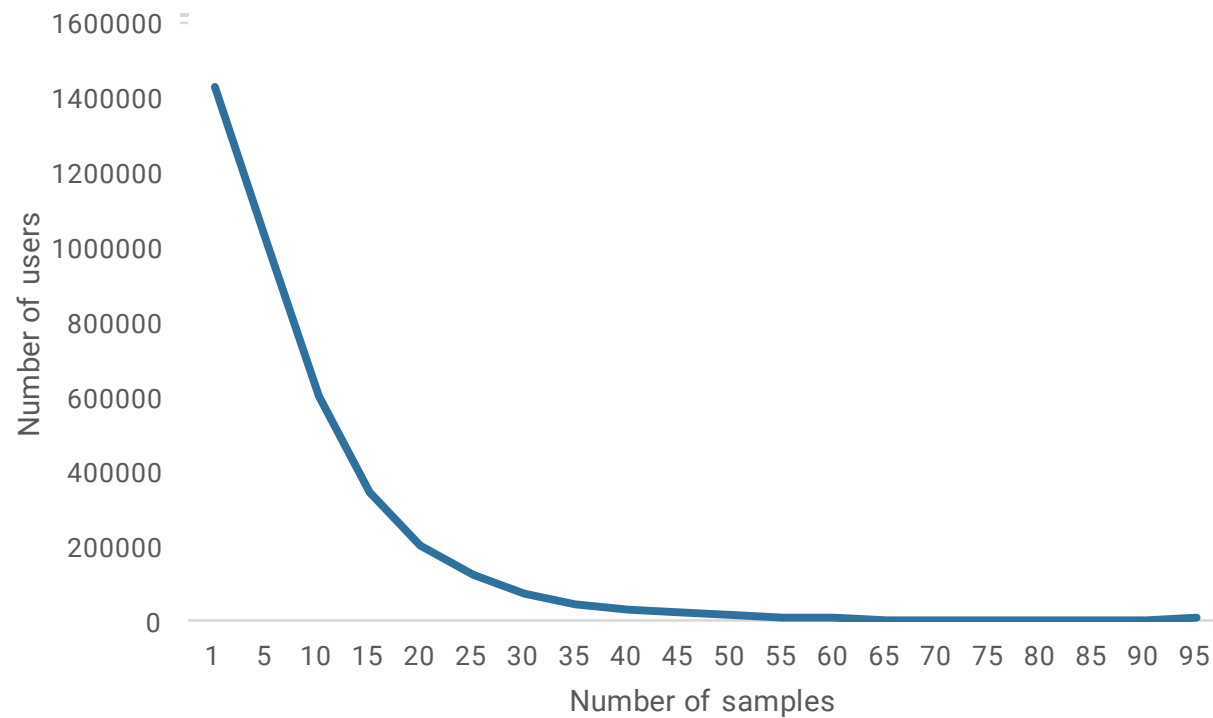
- Peer-to-Peer Payment system
- All mobile devices
- 6-8 digit numeric PIN
- 4 Mio customers
- 40 Mio transactions
- Anonymous data



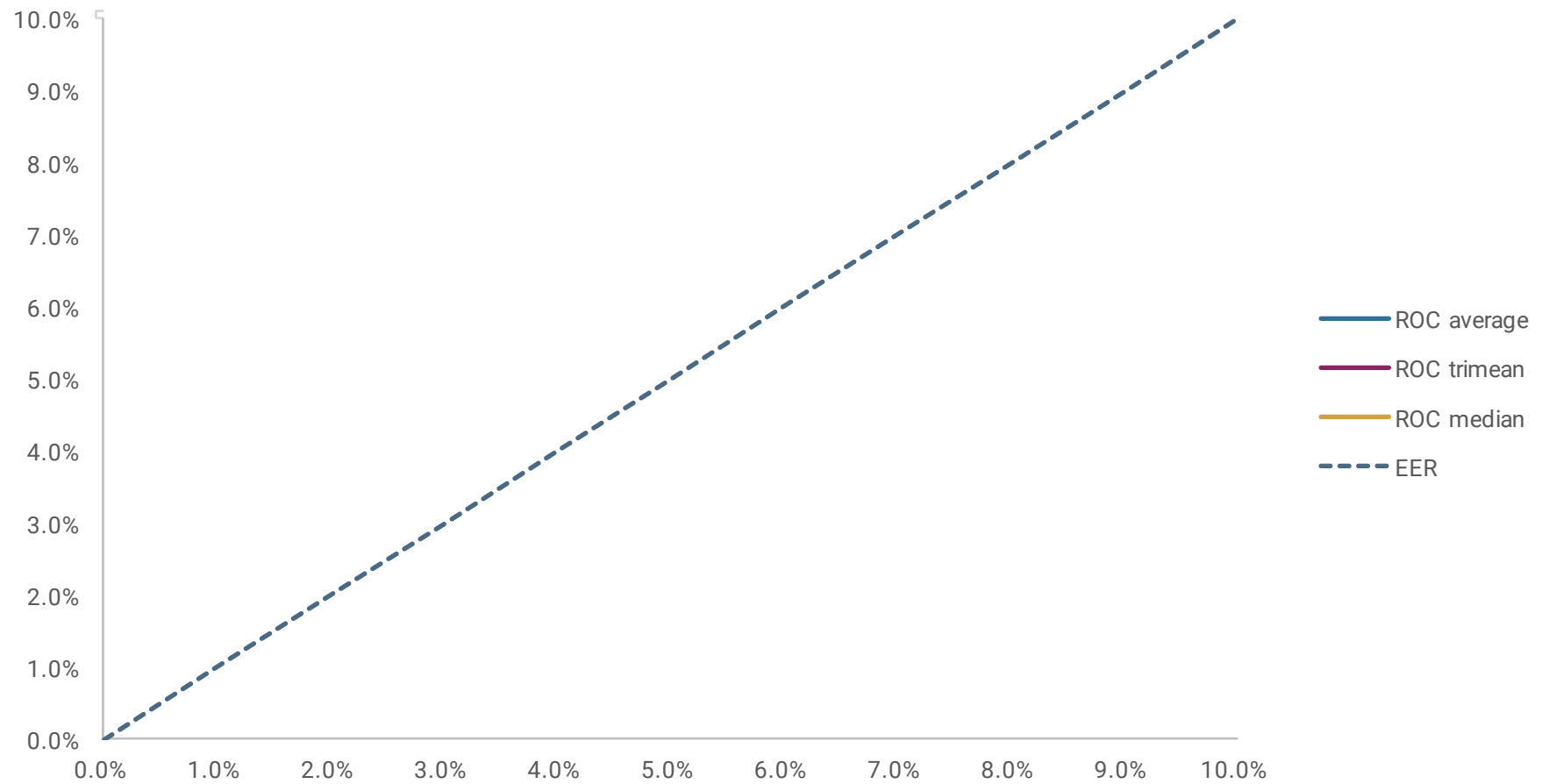
# How to measure

- **Build profile with first 10 transactions**
- **Continuously train the profile if the new behavior is close to the profile**
- **False Reject is calculated on 3 tries**
  - If the right user gets in within these 3 tries, this counts as accepted
- **False Accept is calculated on 3 tries**
  - If the wrong user gets in within 3 tries, this counts as **false** accepted

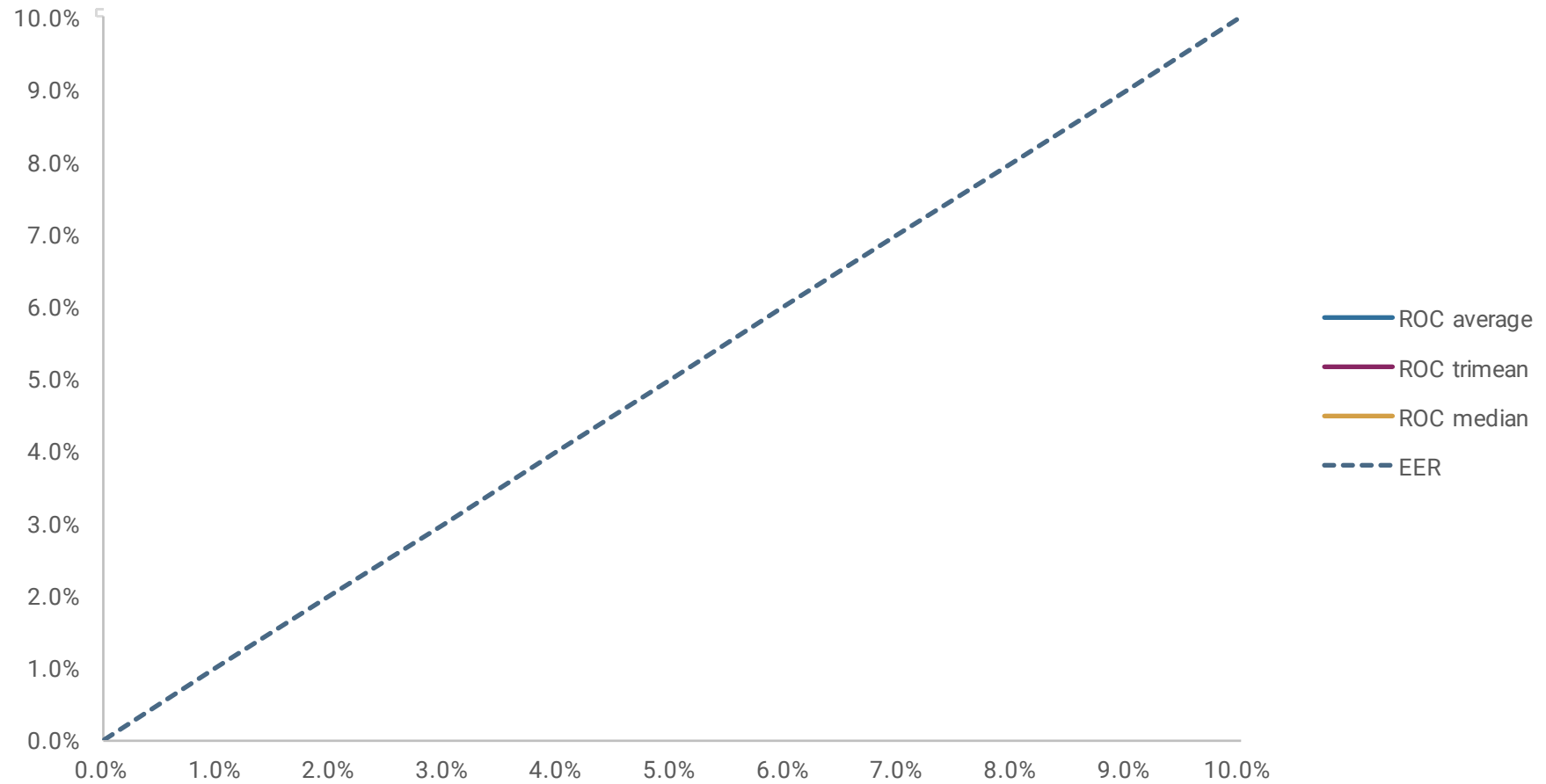
Not all had enough transactions....



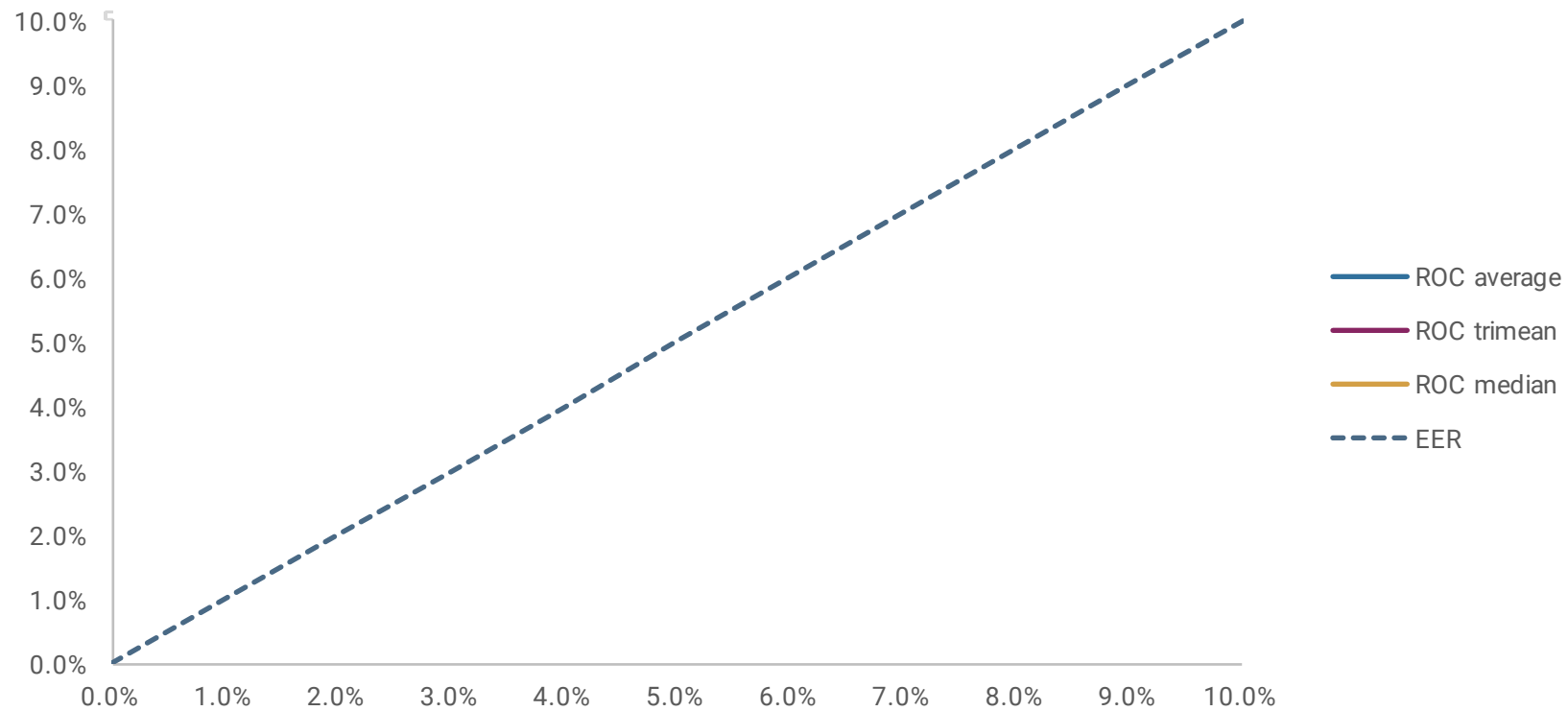
# Password 1 try



# Password 3 tries

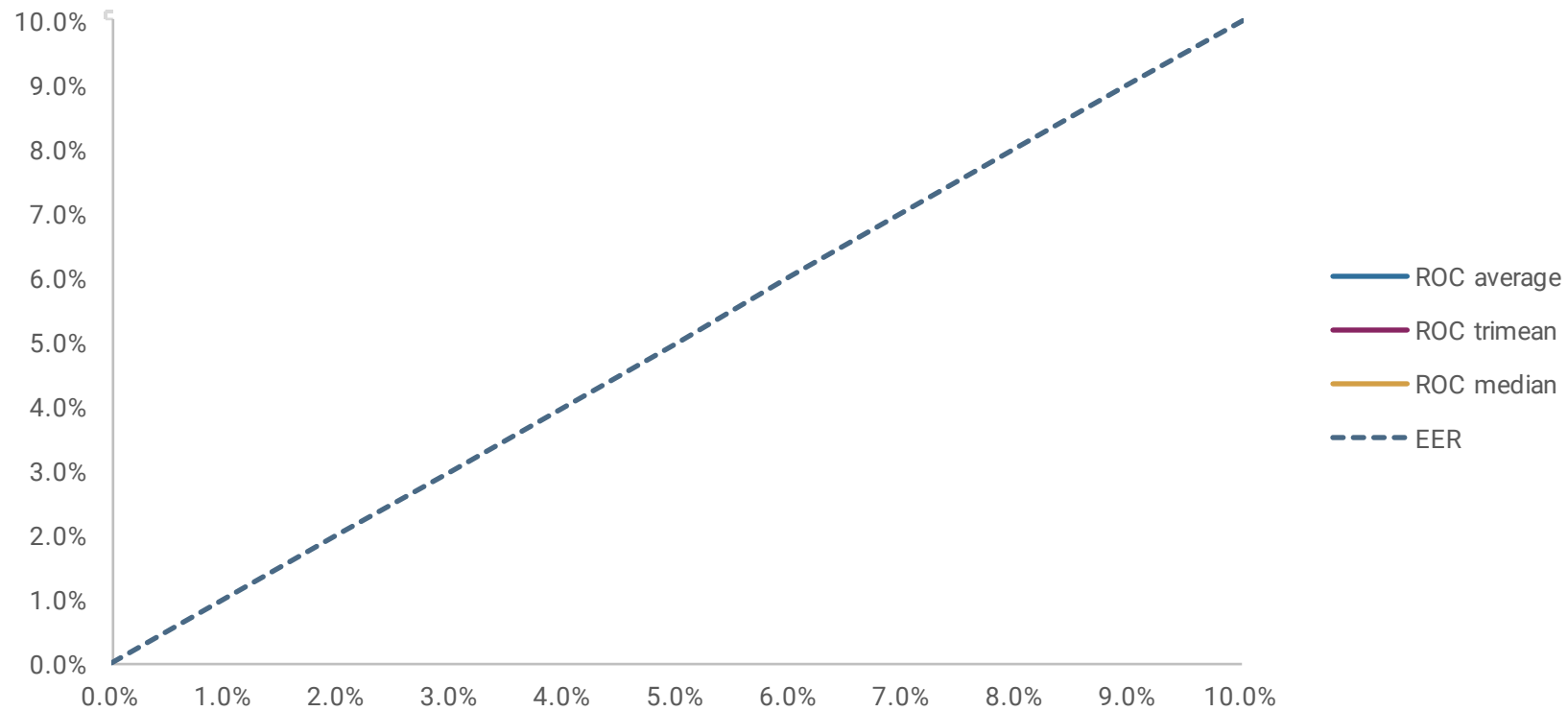


# Controlled dataset payment transaction\*



\*Payment transaction consists of account number, amount, and notes.

# Controlled dataset password + payment transaction\*



\*Payment transaction consists of account number, amount, and notes.



# Results

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## Scenario

## Accuracy

**Password 1 Try**

EER ~3.1%

**Password 3 Tries**

FAR 1.8 % FRR 0

**Payment**

EER ~1.4%

**Session**

EER ~1.3%

Read more...



5 Offices  
7 Nationalities  
50+ Customers  
15+M End Users

>>4+ B

Transactions in 2016

We .... MADE A SPACE  
...QUESTIONED norms  
...RESEARCHED to improve via ML & BD  
...DEVELOPED continuous authentication  
...PROPOSED to DARPA & Google  
...CREATED developer SDK  
...WON global FinTech endorsement  
...EMPOWERED identity providers

# Thank you.

