

J.P.MORGAN CHASE & CO

FACIAL RECOGNITION

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AGENDA

Overview

Problem

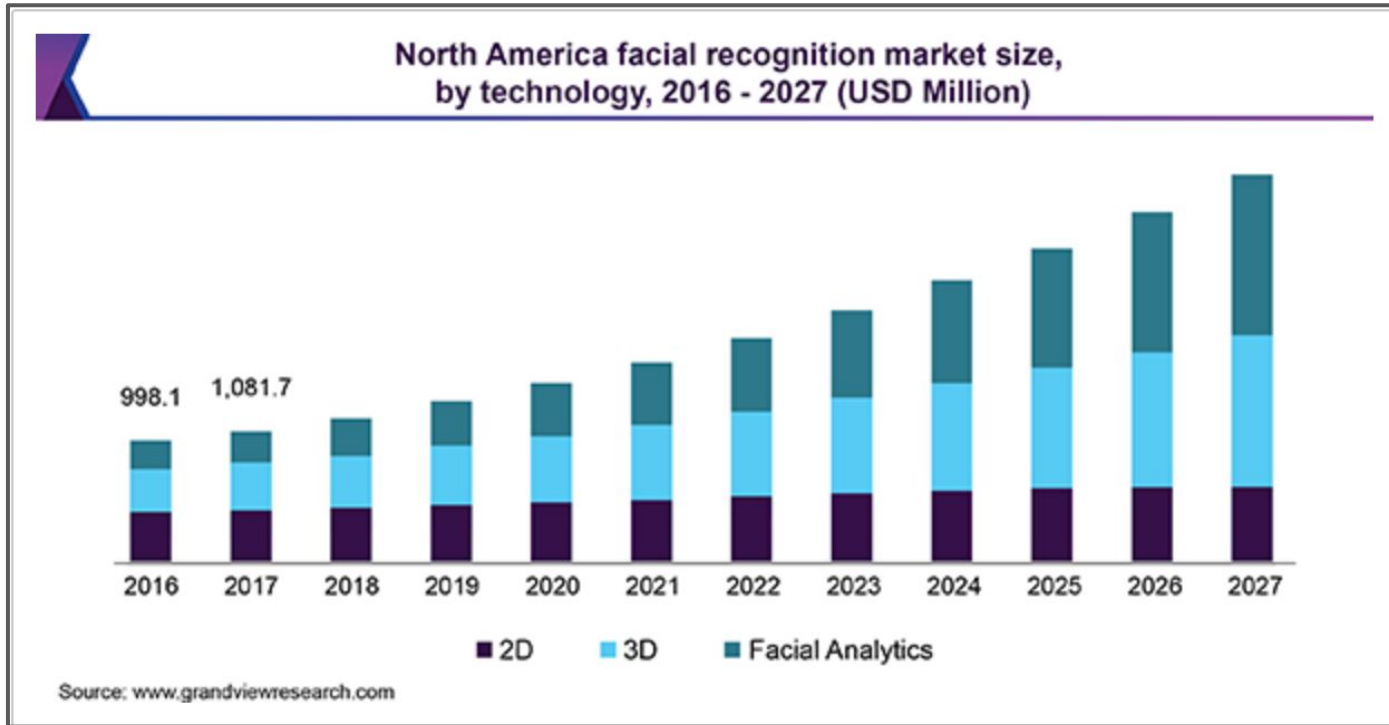
Recommendation

Impact

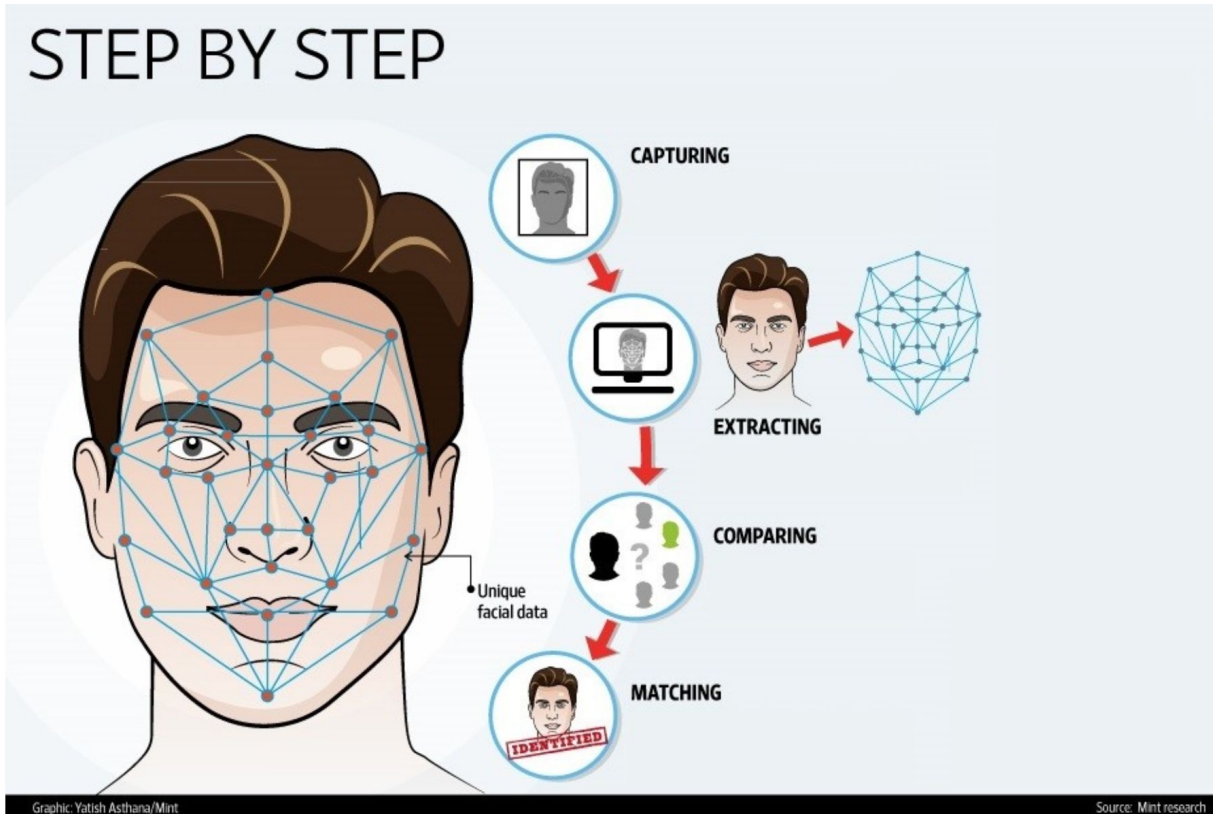
Financial Metrics

Conclusion

Facial Recognition Industry



Facial Recognition Industry



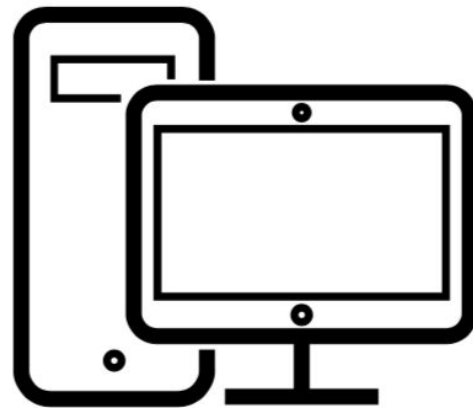
EMERGING INDUSTRY LEADERS

Agencies to watch

Security

Law Enforcement

Smartphones



Problem

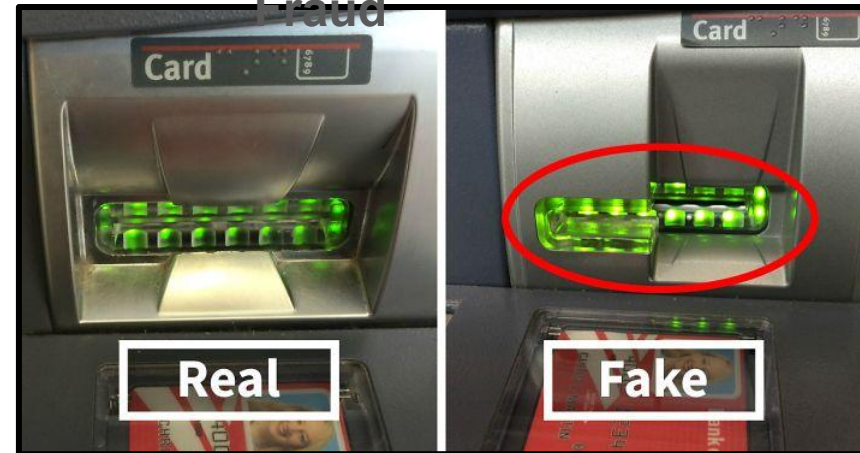


Identity Theft

“Over 9 million Americans have their identities stolen from credit card fraud each year”

**Automatic
Teller Machine**

Fraud



Example of “skimming” fraud

Problem

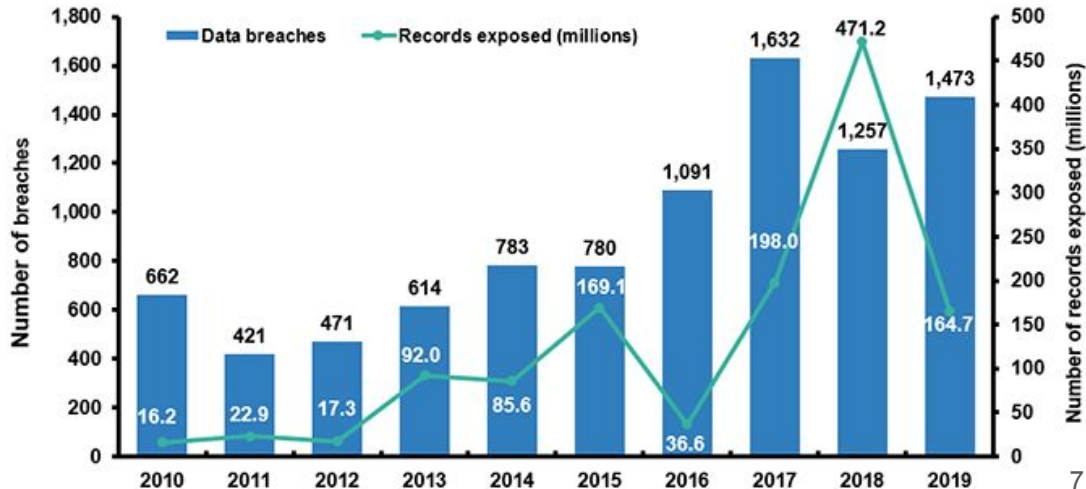
Bank Hacking



Cybersecurity faults “may very well be the **biggest** threat to the U.S. financial system,”– Jamie Dimon, JPMorgan’s chief executive

Data Breach

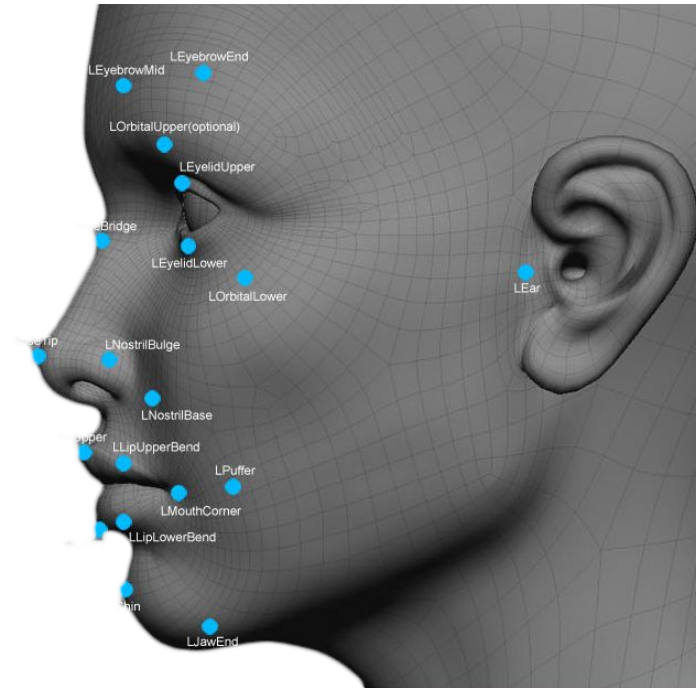
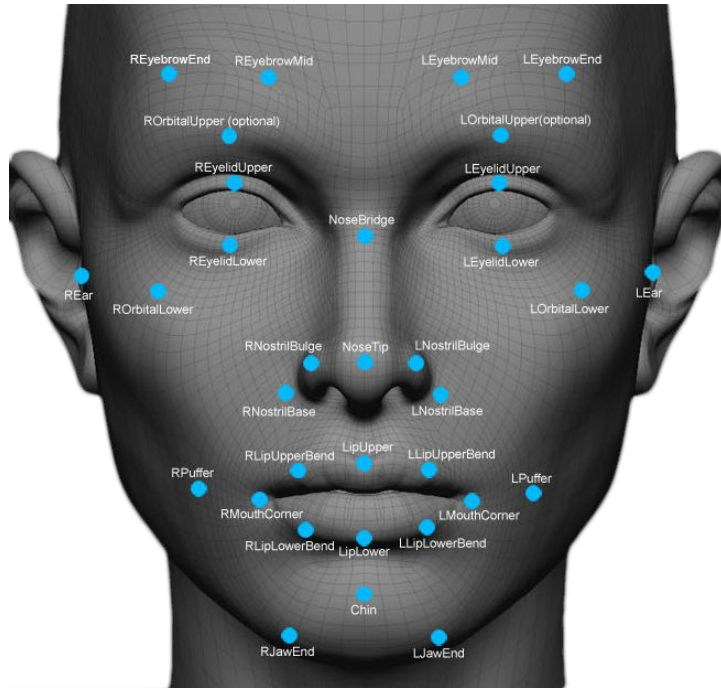
Number of Data Breaches and Data Exposed 2010-2019

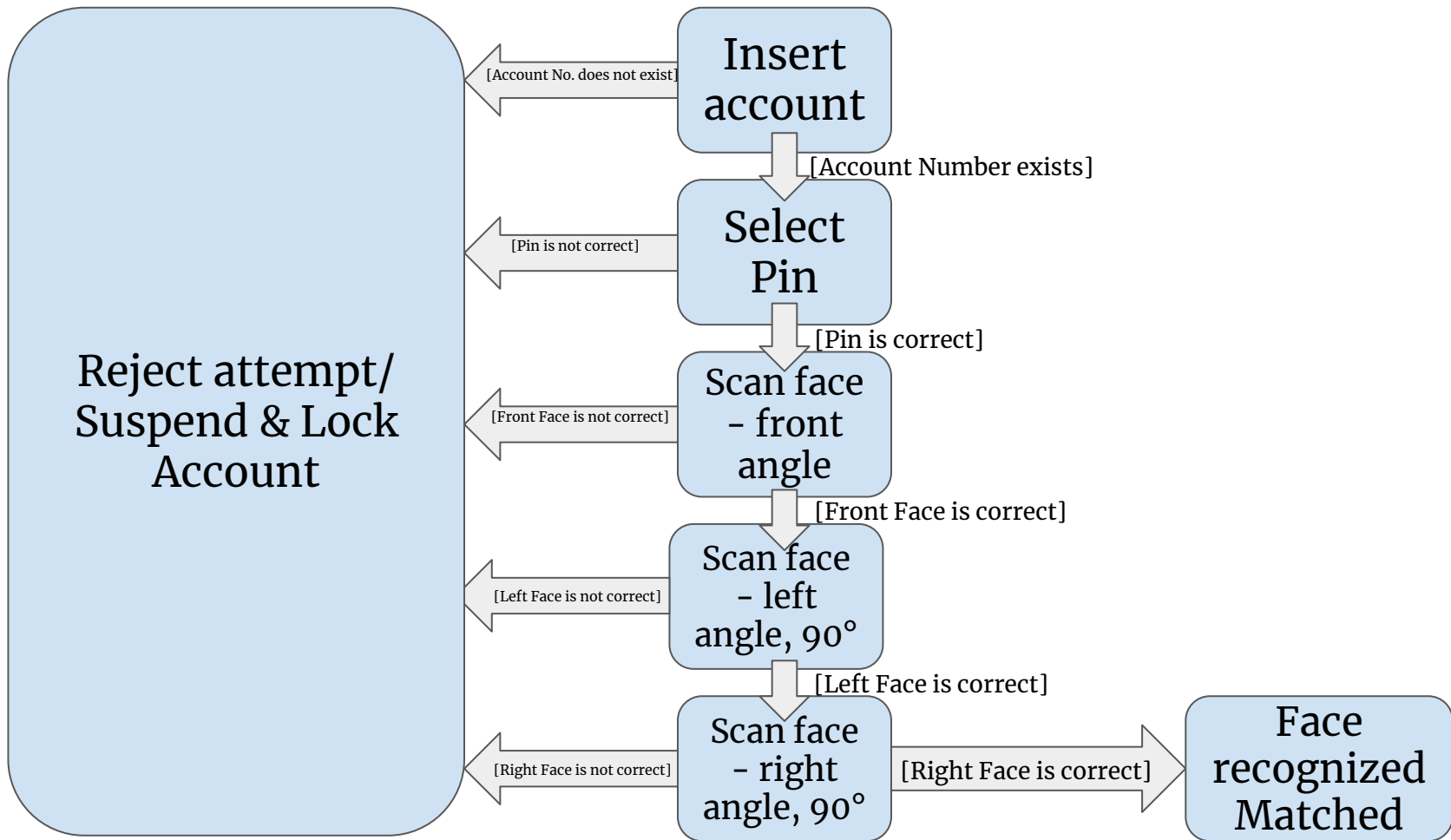


Solution

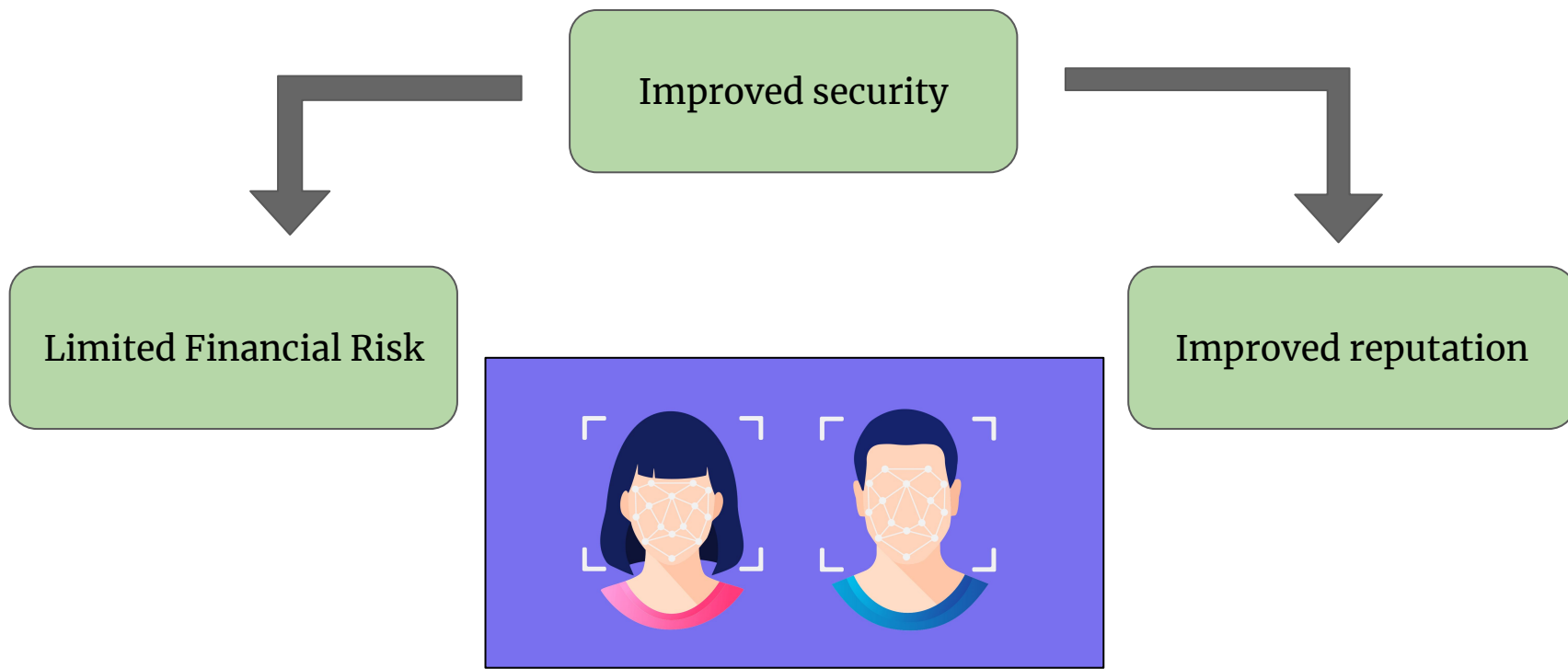
- Implement **facial recognition** software into all JPMorgan & Chase ATMs across the world.
 - All customers will receive a complimentary facial scan with an open account.
- Allow customers to withdraw and deposit funds with a simple scan of their face.

1. Face detection
2. Face capture
3. Face match





Impact

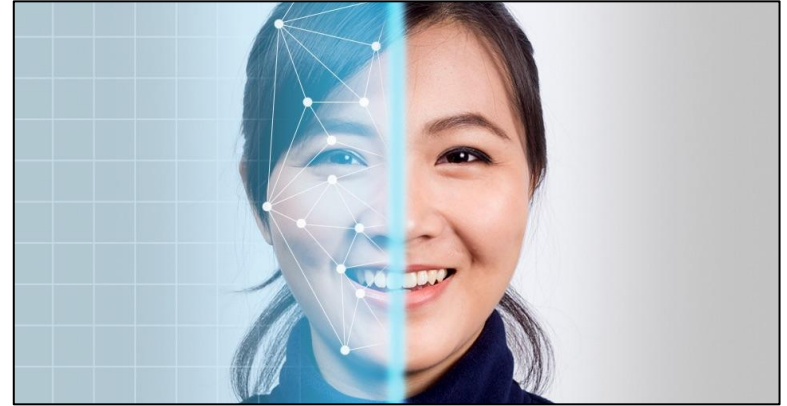


Impact

Further push
for touchless

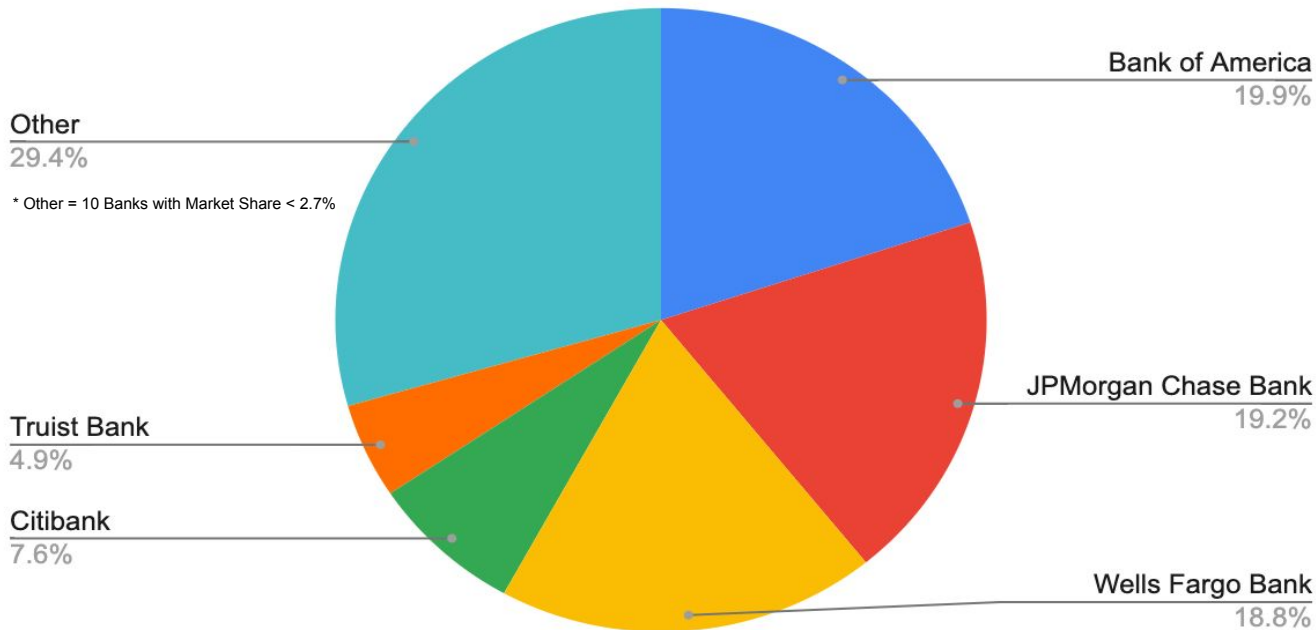


Over 61.6 million Americans prefer to use mobile pay which is a 28% increase in just 2 years



First Mover
Advantage

Bank Industry \$1.2 Billion Yearly Loss in ATM Based Fraud: Top 15 U.S. Banks by Market Share



Estimated Cost of Facial Recognition Software ATM Implementation:

1. Upfront Cost = \$20,144,000
2. Yearly Cost = \$8,912,000
3. Cost per Unit = \$1,259

Total Cost Over 5 Years =
\$65,100,000

*"Face recognition technology helps the machine to identify each and every user uniquely thus making face as a key. **This completely eliminates the chances of fraud due to theft and duplicity of the ATM cards.**"* - Study on Enhanced Security for ATM Machine with OTP and Facial Recognition Feature



Estimated reduction of ATM Based Fraud = 80%

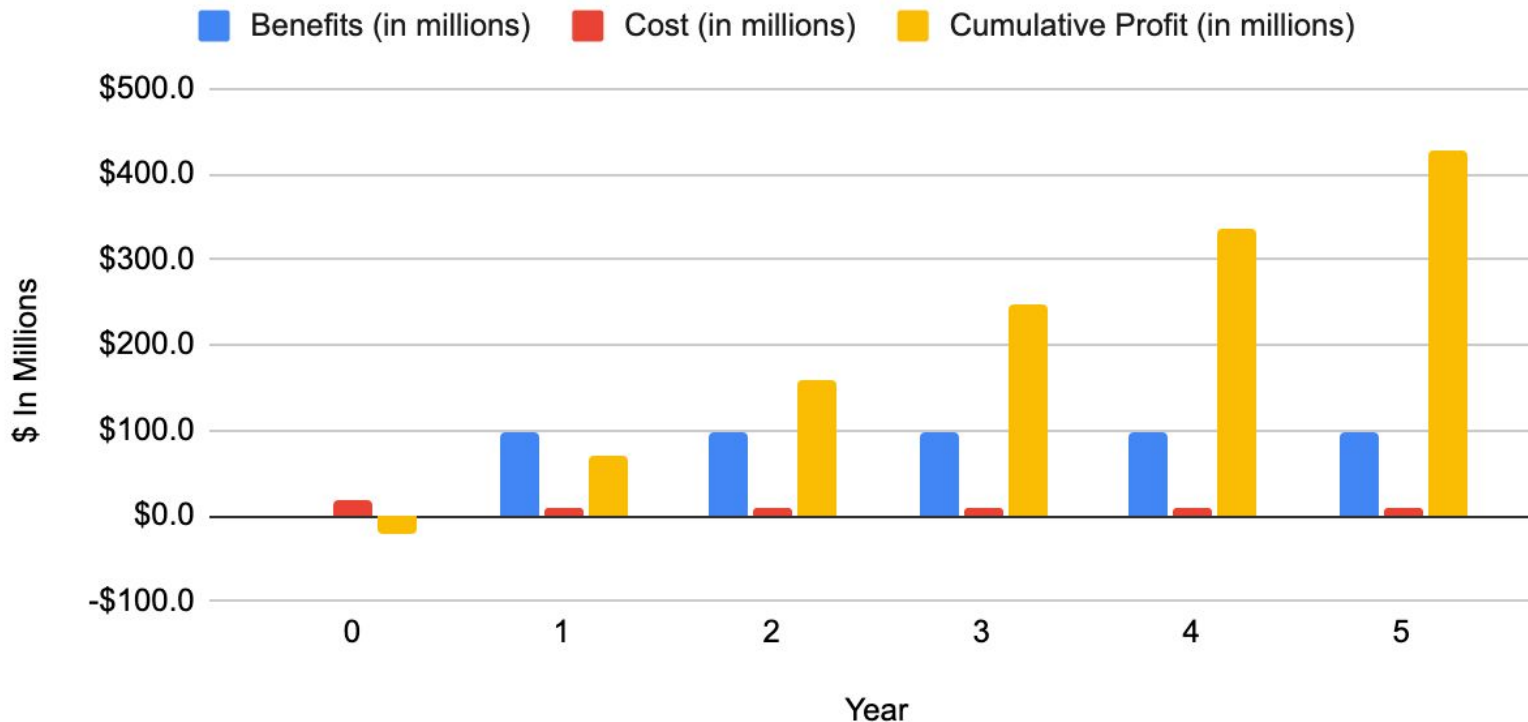
JPM ATM Fraud Protection: Revenue, Cost and Profit over 5 years

Year 1 Profit = **\$98,400,000**

5 Year Return = **\$435,800,000**

*Benefit calculated as avoidance of fraud settlement fees

Sensitivity Analysis = 7.5x



- ❖ Cost
- ❖ Political and Social
- ❖ Security
- ❖ Technology

JPMORGAN CHASE & CO

Appendices

Improvements to Facial Recognition Software:

- 1) Algorithms and Iris Recognition
- 2) When we get errors: Poor lighting
 - a) Solution: ATM's and Lighting
- 3) Why Facial Recognition?



Industry Loss Breakdown By Top 15 U.S. Banks Calculations

<u>Bank</u>	<u>Market Share (%) & Loss (millions)</u>
Bank of America	10.58% \$128.00
JPMorgan Chase Bank	10.21% \$123.00
Wells Fargo Bank	10.00% \$120.00
Citibank	4.04% \$49.00
Truist Bank	2.62% \$31.00
Other	15.63% \$188.00

% Market Share * 1.2 Billion Industry Loss = Approximate Individual Bank Loss

Cost Calculations

COSTS

1. Unit Price/Installation: VeriLook Standard SDK = \$702.00
2. Yearly License Cost per Unit = \$557.00
3. Amount of JPMorgan Chase & Co ATMs: 16,000 in U.S.

Year 0 Cost = (Unit Price/Installation + Yearly Cost) * Units = \$20,144,000

Year 1+ Cost = Yearly License Cost * Units = \$8,912,000

Upfront Cost = (Unit Price/Installation + Yearly Cost) * Units = (\$702 + \$557)*16,000 = **\$20,144,000**

Yearly Cost = Yearly Cost * Units = \$557*16,000 = **\$8,912,000**

Total Cost Over 5 Years = **\$65,100,000**

	A	B	C	D
1	Year	Benefits (in millions)	Cost (in millions)	Cumulative Profit (in millions)
2	0	\$0.0	\$20.1	-\$20.1
3	1	\$98.4	\$9.0	\$69.3
4	2	\$98.4	\$9.0	\$158.7
5	3	\$98.4	\$9.0	\$248.1
6	4	\$98.4	\$9.0	\$337.5
7	5	\$98.4	\$9.0	\$426.9
8			\$65.1	

1. Face Recognition Software Development Kits. (2020). Retrieved November 27, 2020, from <https://www.fulcrumbiometrics.com/Face-Development-kits-s/24.htm>
2. VeriLook Deployment Licenses. (2020). Retrieved November 27, 2020, from <https://www.fulcrumbiometrics.com/VeriLook-Licenses-s/29.htm>
3. Chase. (2020). Retrieved November 27, 2020, from <https://www.chase.com/digital/resources/about-chase>

Benefits Calculations

BENEFITS

1. Industry losses due to fraud (Specifically Pin and ATMs) = \$1.2 billion
2. JPMorgan Chase and Co Market Share = 10.21%
3. Decrease in fraud: 80%, 100% seems unrealistic as there could be some error (Sources 3 & 4)

fx		A	B	C	D
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JPMorgan Chase and Co losses to fraud due to ATMs = \$1.2 billion * .1021 = **\$123 million**

If new technology cuts ATM fraud by 80% = \$123 million * 0.8 = \$98.4 million

*Benefit calculated as avoidance of fraud settlement fees

1. ABA. Published January 1, 2. (n.d.). Deposit Account Fraud Survey. Retrieved November 27, 2020, from <https://www.aba.com/news-research/research-analysis/deposit-account-fraud-survey-report>
2. Norrestad, P., & 6, N. (2020, November 06). Market share of leading U.S. banks by domestic deposits 2019. Retrieved November 27, 2020, from <https://www.statista.com/statistics/727546/market-share-of-leading-banks-usa-domestic-deposits/>
3. Karovaliya, M., Karedia, S., Oza, S., & Kalbande, D. (2015). Enhanced Security for ATM Machine with OTP and Facial Recognition Features. *Procedia Computer Science*, 45, 390-396. doi:10.1016/j.procs.2015.03.166
4. Peter, K. J., Glory, G. G. S., Arguman, S., Nagarajan, G., Devi, V. S., & Kannan, K. S. (2011, April). Improving ATM security via face recognition. In *2011 3rd International Conference on Electronics Computer Technology* (Vol. 6, pp. 373-376). IEEE

Return, ROI, and Break-Even Calculations

1. RETURN (Across 5 Years)

$$\text{Return} = \text{Benefit} \times 5 - \text{Upfront Cost} - (\text{Yearly Cost} \times 4) = \$98,400,000 \times 5 - \$20,144,000 - (\$8,912,000 \times 4) = \underline{\$435,800,000}$$

2. ROI

$$\text{ROI} = \text{Cumulative profit} / \text{total cost (for first five years)} = \$426.9 / \$65.1 = \underline{7.6x}$$

3. BREAK-EVEN PERIOD

As evident in graph on slide 13, one-year period.

4. SENSITIVITY ANALYSIS

$$1. \text{ Total 5 Year Benefits} = \text{Number of Units} \times x$$

$$\$492,000,000 = 16,000x$$

$$\$30,750 = x$$

$$2. \text{ Total Benefits Over 5 Years} / \text{Total Cost over 5 Years} = x$$

$$\$492,000,000 / \$65,100,000 = x$$

$$7.5 \approx x$$

*1. As long as it costs less than \$30,750 per Unit to implement, this investment will still be profitable

*2. In other words, this investment would no longer be profitable if the total cost were to be multiplied by ≈ 7.5

Works Cited

ABA. Published January 1, 2. (n.d.). Deposit Account Fraud Survey. Retrieved November 27, 2020, from <https://www.aba.com/news-research/research-analysis/deposit-account-fraud-survey-report>

Calvello, M. (2017, October). Facing the Reality of Facial Recognition: The Good and the Bad. Retrieved November 30, 2020, from <https://learn.g2.com/facial-recognition>

Chase. (2020). Retrieved November 27, 2020, from <https://www.chase.com/digital/resources/about-chase>

Chase. (2020). Retrieved November 27, 2020, from <https://www.chase.com/digital/resources/about-chase>

Face Recognition Software Development Kits. (2020). Retrieved November 27, 2020, from <https://www.fulcrumbiometrics.com/Face-Development-kits-s/24.htm>

Facial Recognition Market Size: Industry Report, 2020-2027. (2020, March). Retrieved November 30, 2020, from <https://www.grandviewresearch.com/industry-analysis/facial-recognition-market>

Facts + Statistics: Identity theft and cybercrime. (n.d.). Retrieved November 30, 2020, from <https://www.iii.org/fact-statistic/facts-statistics-identity-theft-and-cybercrime>

Karoliya, M., Karedia, S., Oza, S., & Kalbande, D. (2015). Enhanced Security for ATM Machine with OTP and Facial Recognition Features. *Procedia Computer Science*, 45, 390-396. doi:10.1016/j.procs.2015.03.166

Kats, R. (2018, November 9). The Mobile Payments Series: US. Retrieved November 30, 2020, from <https://www.emarketer.com/content/the-mobile-payments-series-the-us>

Malviya, D. (2014, December). Face Recognition Technique: Enhanced Safety Approach for ATM. Retrieved November 30, 2020, from <http://www.ijsrp.org/research-paper-1214/ijsrp-p3633.pdf>

Norrestad, P., & 6, N. (2020, November 06). Market share of leading U.S. banks by domestic deposits 2019. Retrieved November 27, 2020, from <https://www.statista.com/statistics/727546/market-share-of-leading-banks-usa-domestic-deposits/>

Peter, K. J., Glory, G. G. S., Arguman, S., Nagarajan, G., Devi, V. S., & Kannan, K. S. (2011, April). Improving ATM security via face recognition. In *2011 3rd International Conference on Electronics Computer Technology* (Vol. 6, pp. 373-376). IEEE

Thakkar, D. (2018, August 08). Retinal vs. Iris Recognition: Your Eyes Can Get You Identified? Retrieved November 30, 2020, from <https://www.bayometric.com/retinal-vs-iris-recognition/>

The Future of Face Recognition. (2017, September 05). Retrieved November 30, 2020, from <http://devfun-lab.com/1214>

VeriLook Deployment Licenses. (2020). Retrieved November 27, 2020, from <https://www.fulcrumbiometrics.com/VeriLook-Licenses-s/29.htm>