AI for Fraud Detection in Financial Institutions: A Case Study on American Express, and Capital One

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I. Introduction

- In this case study, we explore how financial institutions such as American Express and Capital One use artificial intelligence to create a safer environment and enhance fraud detection. For financial institutions to provide efficient services to their customers, they must implement new strategies to protect them from digital fraud, as digital transactions become increasingly common, and many banks face the challenge of safeguarding their customers. AI plays a significant role in providing a safety net for identifying suspicious activities and preventing fraud in real time.

- The purpose of this study is to investigate the various ways AI has been utilized to combat fraud and provide protection techniques against any form of fraud. The presentation will cover the benefits, challenges, and general information regarding AI in banks such as American Express.

- American express is an institution that was founded in 1850 hy three man called William Fargo, Henry Wells, and John Butterfield, in New York. The American express company specializes in many financial services, such as payment cards.

II. Why is AI Essential for American Express

- American Express is a company that processes millions of transactions daily, in which is important for them to take fraud detection seriously.

- AI also enhances how American Express interacts with its costumer, and how efficient they make the process smoothly.

- The use of AI also optimizes internal operations, driving data-driven decisions, and enhance operation al efficiency.

Our Work: Use of Deep Learning Techniques to Identify Fraud | American Express
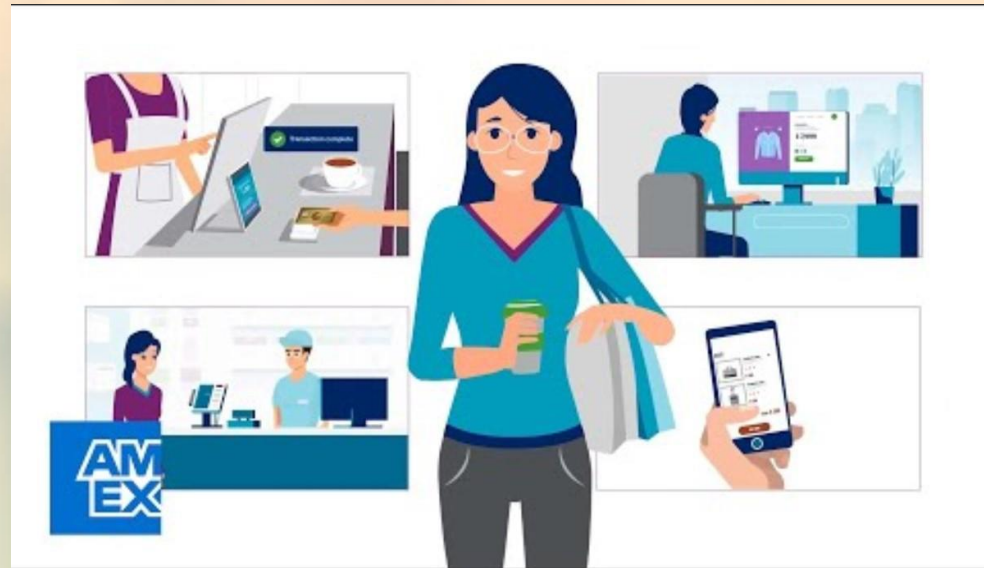
# III. AI technologies & tools utilized by American Express

- American Express has been adopting AI in order to innovate its financial services, and AI has also worked to optimize operations, enhance experiences, and prevent fraud prevention for all customers.

- "The company uses machine learning to analyze large datasets and detect fraud patterns. (DigitalDefynd, 2025)" AI enables real-time monitoring in order to prevent potential fraud and safeguard costumers.

- Machine Learning & Deep learning: self-learning algorithms continuously improve fraud detection accuracy.

- Neural Networks: The AI system detects animalities in usual transactions. Helps prevent fraud and identity theft.

IV. Challenges & limitations

- There are not of limitations express by American express. However, one will argue that the main challenge they face is the reliability of using technology in every aspect and giving a lot of trust.

- Sharing sensitive organizational information with new and developing generative AI platforms, needless to say, carries risk.

- A failure to invest in generative AI products and policies may also leave organizations vulnerable to a lack of trade knowledge and best practices, leading them to fall behind. Which could be considered a challenge.
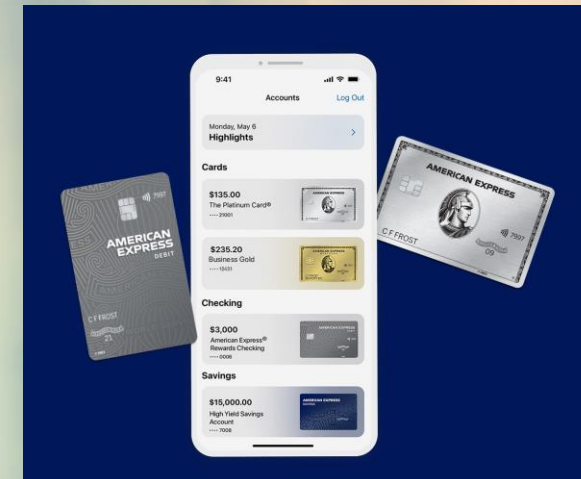
V. Conclusion

- AI has transformed fraud detection at American Express by providing real-time, accurate, and efficient fraud prevention. The company has benefited from the reduced financial losses, and improved security. Even when they are faced with challenges, many financial institution will be benefited by the use of AI. While exact internal metrics are proprietary, there are indications of AmEx's AI success. They were ranked No. 1 in the J.D. Power Customer Satisfaction Study among credit card issuers in the U.S, a commendation they've received ten times in the past fourteen years. The blend of AI with their existing customer service mechanisms possibly plays a role in maintaining this leading market position.
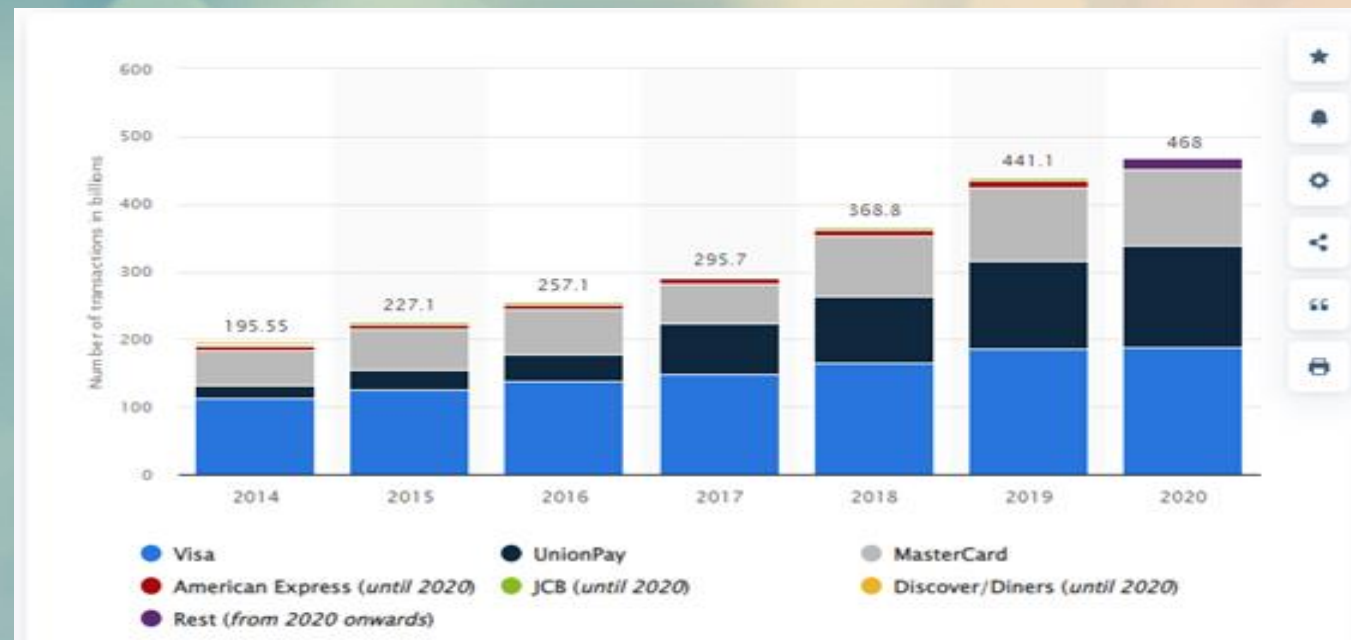
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