



**ORIGINAL RESEARCH PAPER**

**Computer Science**

**DATA SCIENCE RESEARCH PAPER  
DATA SCIENCE IN BANKING (FINANCE)**

**KEY WORDS:** Banking industry, challenges, fraud, technology, creative solutions, Data Science, unstructured data, tactical insights, Finance, Business environment, industry issues, solutions, role of Data Science

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**ABSTRACT**

The banking industry faces a number of difficulties, including fraud, in the quickly changing business environment driven by technology, needing creative solutions. Data Science is proving to be a powerful tool for overcoming these obstacles by turning unstructured data into tactical insights. This paper examines the Finance and Banking industry, highlighting its issues and emphasizing the crucial role that Data Science plays in solving them.

**INTRODUCTION**

In today's techno-driven world, the business world is rapidly evolving. However, this development comes with a cost. The banking industry faces numerous challenges, for instance, frauds. It is then that Data Science emerges as a powerful tool to overcome these obstacles in banking.

Data Science involves gathering valuable insights and sorting them as per the requirement. These insights are useful in making strategic decisions and enabling predictive modeling. Data Science, therefore, transforms raw data into useful data.

This study aims at identifying the problems faced in this major industry of Finance, Banking, and explaining how Data Science is useful in overcoming these challenges.

**Case Study**

**1. Fraud Detection:**

Fraud in banking is illegally obtaining money, assets, etc. held by the banking institutions. It also involves pretending to be a bank and attaining money from the depositors. This is when Data Science comes to rescue. Data Science can help to handle large amounts of data altogether at once which in turn helps to keep track of the data available. It helps to detect transactions and even if one of them is identified as a suspicious transaction, it denies it or notifies the user.

**2. Personalized Customer Experience:**

Personalized service to customers in banking is delivering a valuable service to the customer based on personal experiences and past customer data. By being unaware of the customer's previous experience with banking with that financial institution, one cannot determine the future expectations of that customer with that bank. Data Science therefore helps gather previously collected data and then analyze it according to various categories. To provide the customer a personalized experience, the previously collected data is executed in the required manner and helps the customer get the specific service according to preference.

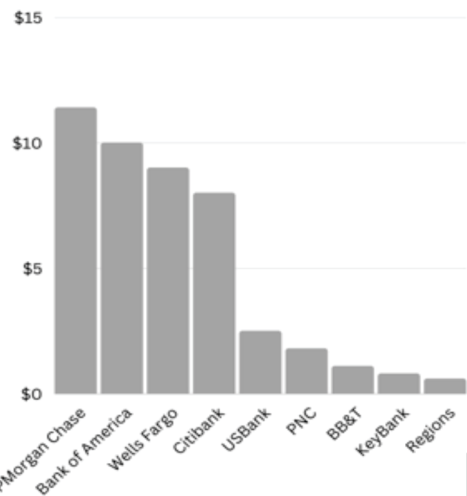
**3. Risk Management:**

Despite being a negative point, banking and risks go hand in hand. Where there is banking, there is risk: risk of changing trends in the market, risk of changing consumer behavior or risk in the form of banking transactions. For instance, Data Science is used to build more powerful predictive models to assess credit borrowings and much more. This helps in keeping track of the borrowers and how much loan has been given and how much has been paid back. This helps avoid confusion and gives deeper visibility in the consumer's behavior.

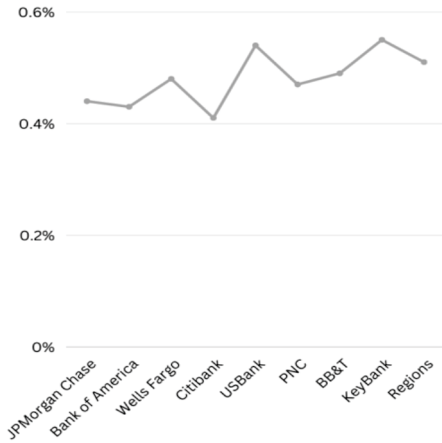
In the growing digital world, the banking sector is spending millions and billions of dollars on developing data analytics and technological models. Credit unions closely lag behind mega and regional banks in terms of overall technological spending. According to the 2018 Performance Report from Cornerstone Advisors, the median technological spending ratio for credit unions was 0.42%. Just 12% less than the average of the nine mega and regional banks, this number. Federally insured credit unions in the US held a total asset value of \$1.42 trillion in Q1 2018, according to the NCUA. This suggests that total spending will be roughly \$6 billion in 2018, which is just over half of what JPMorgan Chase is expected to invest separately during the same time period. However, the situation differs for community banks. 0.22% of mid-size banks' assets, meaning those with \$500 million to \$50 billion in assets, were allotted for technological costs in 2017, according to Cornerstone's data. Although this number may have increased today, it seems improbable that these institutions' investments would have quadrupled in just two years to catch up to the investment rates of the larger banks.

BANK NAME	IT SPEND (\$ millions)	% of Assets
JPMorgan Chase	\$11.4	0.44%
Bank of America	\$10.0	0.43%
Wells Fargo	\$9.0	0.48%
Citibank	\$8.0	0.41%
USBank	\$2.5	0.54%
PNC	\$1.8	0.47%
BB&T	\$1.1	0.49%
KeyBank	\$0.8	0.55%
Regions	\$0.6	0.51%

**Graphical Representation:**



**Bar Chart Representation of IT Spend:**



**Line Chart Representation of % of Assets:**

**CONCLUSION:**

The banking industry has made large investments in data analytics and technology breakthroughs, which have changed the data landscape. Credit unions and community banks trail in terms of technical investment compared to mega and regional banks. The report highlights the various investment strategies of six well-known banks by comparing their IT spending as a percentage of assets.

This study makes it clear that Data Science provides essential solutions to the numerous problems that the banking and financial sectors face. Institutions may improve security, client experiences, and risk management strategies by leveraging the power of data insights, preparing themselves for success in a more complicated environment.

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