Data Analytics in Banking and Financial Services

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Abstract - **In Journal of Banking and Finance [1] we are living in the era of the big data. The rapid development of scientific and data technology over the past decade has brought not only new and sophisticated analytical tools into Financial and Banking services, but also introduced the power of data science application in everyday strategic and operational management. Data analytics and science developments have been particularly valuable to financial organizations that heavily depend on financial information in their decision making processes. The article presents the research that focuses on the impact of the data and technology trends on decision making, particularly in Finance and Banking services. It covers an overview of the benefits associated with the decision analytics and the use of big data by financial organizations. The aim of the research is to highlight the areas of impact where the big data trends are creating disruptive changes to the way the Finance and banking industry traditionally operates. For example, we can see rapid changes to organisation structures, approach to competition and customer as well as the recognition of the importance of data analytics in strategic and tactical decision making. Investment in data analytics is no longer considered a luxury, but necessity, especially for the financial organizations in developing countries. Technology and data science are both forcing and enabling the financial and banking industry to respond to transformative demands and adapt to rapidly changing market conditions in order to survive and thrive in highly competitive global environment. Financial companies operating in developing countries must develop strong understanding of data-related trends and impacts as well as opportunities. This knowledge should not only be utilized for survival efforts, but also seen as the opportunity to engage at global level through innovation, flexibility, and early adoption of data science benefits. The paper also recommends further studies in related areas, which would provide additional value and awareness to the organizations that are considering their participation in the global data and analytical trends.**
Keywords: **Banking, Financial Services, Decision making**

I. INTRODUCTION

In today's data-driven world, data analytics play a crucial role in informed decision making to drive organizations forward, improve efficiency, increase returns, and in turn achieve business goals. For the uninitiated, data analytics is the process of discovery, interpretation, and conveying meaningful insights from the data to help in the decision-making process.

In Banking law and practice [2] According to the latest Worldwide Semi-Annual Big Data and Analytics Spending Guide from one of the top research firms, worldwide revenues for big data and business analytics will go up from $130 billion in 2016 to more than $203 billion in 2020. The applications for data analytics are significantly growing day by day because of various innovations in the field. Out of this $130 billion market share, the banking sector leads revenues with a contribution of $17 billion in 2016.

In Banking law and practice [2] the Banking and Financial Services sector, through data analytics, institutions can monitor and assess large amounts of customer data and create personalized/customized products and services specific to individual consumers. For example, when a customer buys a vehicle, the bank sends promotional offers of insurance to cover the customer's vehicle. In the future, such applications could be expanded even further. One way this could happen is if a customer got a large bill, the bank could offer an EMI conversion or a loan to cover the cost.

Some of the areas where banking and financial institutions are increasingly using data analytics include Megha Shah [3].

1. Fraud detection
2. Managing customer data
3. Risk modeling for investment banks
4. Personalized marketing
5. Lifetime value prediction
6. Real-time and predictive analytics
7. Customer segmentation
8. Customer spending patterns
9. Transaction channel identification
10. Customer feedback analysis and application

The importance of data analytics in the banking and financial services sector has been realized at a greater scale and most of the established banks have already started reaping the benefits.

For instance, an American bank used machine learning to comprehend the discounts that its private bankers were providing to customers. Bankers were claiming that they offered discounts only to important/ valuable customers. However, when the data was assessed through analytics, it showed a different story. It showed the discount patterns which were not needed, and which could easily be

corrected. The bank adopted the changes, leading to an increase in revenues by 8% within few months.

A leading industry survey conducted for 20 banks across the EMEA region revealed that there were certain areas of improvement, which if worked upon could deliver great returns. Some of the areas included were:

1. Aligning the priorities of analytics to the strategic vision of the banks
2. Incorporating decision making with analytics practices
3. Developing advanced-analytics assets on a large scale and investing in the roles which are critical to analytics
4. Enabling the user revolution with clearly defined data ownership and maintenance of high-quality data

To gain competitive advantage, banks should recognize the importance of data science, incorporate it in their decision-making process, and develop strategies based on the actionable insights from their customer's data. Start with small, doable steps to integrate data analytics into operating models and stay ahead of competition where to Find Business Cases that Justify Projects.

Many existing business capabilities can be enhanced when more and varied data becomes part of the Information Architecture. IT organizations at banking and financial services companies typically work with their lines of business to build solutions that deliver the following when defining Big Data projectsData Analytics - Anil Maheshwari[4].

TABLE IFINANCIAL SERVICES AND BANKING SAMPLE FUNCTIONAL AREAS, BUSINESS CHALLENGES &OPPORTUNITIES[5].

FUNCTIONAL AREA	BUSINESS CHALLENGE	OPPORTUNITY
Revenue increases and improved profit margins	Increase revenues globally Enhance profit margins	Launch new services and expand into global markets with targeted services. Enhanced cross-sell/up-sell opportunities. Reduce risk and costs to boost profitability
Risk Management	Reduce exposure and optimize asset utilizationSignificant compute capacity required for valuations	Improve credit scoring utilizing non-traditional sources of data. Utilize open technologies such as Hadoop/Spark for massively parallel compute
Fraud Detection	Detect fraudulent transaction with greater accuracy to reduce costs	Correlate seemingly unrelated incidents to identify fraud. Utilize machine learning to keep up with ever changing fraudulent activity
Broker and Trade Compliance	Monitor illicit trading activity	Identify trading misconduct by correlating unstructured content such as IM chats, emails, and telephone calls with trading activity
Anti-Money Laundering	Detect fraudulent transaction with greater speed and accuracy to reduce exposure	Utilize Big Data technologies to rapidly ingest large amount of data for anti-money laundering (AML) purposes. Use machine learning to reduce the number of false positives
Marketing and Customer 360	Grow the business by selling more services and products to customers.	Better understand customer behavior and needs. Identify customers with long term profitability potential Proactively make context relevant offers
Reputational Risk	Protect the brand	Monitor the web to understand customer sentiment towards the bank's products, employees, board members etc.

A. Enterprise Modeling and Analytics Platforms

Banks are building data reservoirs as places to store data extracts from all operational and non-traditional data sources. Business users and analysts explore the data in the data reservoir and develop analytic business models in a self-service environment. Big Data technologies have been applied successfully in a number of financial services use cases, but the enterprise level use of Big Data for firm-wide analytic problems remains a challenge. Building an enterprise analytics platform gives users controlled access to all the data to explore it, build models, and deploy the models.

B. Mobility and Location based Services

As credit card interchange fees come under fire, banks are trying to offer value added services to merchants. Banks have an incredible amount of information available about the buying behavior of their customers. When combined with the location of the customer, it is possible to drive the customer to visit a merchant location. For example, a time bound offer for a local restaurant that has a relationship with the bank can be made to a customer via their mobile device as they walk into a movie theatre.

C. Increased Customer Wallet Share

Understanding the life cycle of a customer enables more services to be sold to the customer over time. The value of the customer continues to grow as more and more services are sold to them. Social media can be a good source of data to get a head start on life events including, graduation, first job, engagement, weddings, college costs and retirement. This insight can enable more products to be sold by getting the right product in front of the consumer at the right time.

D. Customer Intimacy

Every engagement with the customer can be a selling opportunity. Better understanding of the customer, their traits, how they like to communicate, services they

consume, and their value to the business enables the right product to be positioned to the customer at the right time for the right price.

E. IT operational efficiency

Not unique to banking and financial services companies and rarely driven from the lines of business (but a possible reason for embarking on extended architectures that include Hadoop) is the need to move data staging and transformation to a schema-less platform for more efficient processing and leveraging of IT resources. IT operational efficiency is often difficult to prove but is sometimes an initial justification that IT organizations gravitate toward when deploying these types of solutions. We show a table that summarizes several typical business challenges in financial services and banking companies and illustrates the opportunity for new or enhanced business capability when adding new analytic capabilities.

Financial services and banking companies gather sensitive data that in the wrong hands could lead to liability claims and worse. So securing access to the data, regardless of data management platforms, tools, and data transmission methods used, is critical. Data governance needs regarding the meaning of data as well as its accuracy and quality will often require close coordination with and among multiple lines of business.

II. CONCLUSION

Banking analytics, or applications of data mining in banking, can help improve how banks segment, target, acquire and retain customers. Additionally, improvements to risk management, customer understanding, risk and fraud enable banks to maintain and grow a more profitable customer base.From all customers, business and compliance point of view, such analysis is at most required. Big data service provider companies have a great chance to grab this market and take it to the next level. A lot of improvements can be needed in Merchant Account Solutions, credit card segment such as wireless credit card reader, Best Credit Card Swiper, etc.to make it secure and handy for the users.

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