

# Analyzing the role of big data in activating social responsibility, supporting the sustainable development of Saudi banks

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## ABSTRACT

The efficient banking sector is a leader in the development and its position in the Kingdom of Saudi Arabia increases with the trend towards economic diversification and sustainable development, which prompted the researcher to analyze the uses of big data as a tool that enables Saudi banks to avoid several shortcomings that mar their performance and then raise the level of their societal responsibilities (Social Performance Index) To develop production) and to support sustainable development. Then, he analyzed areas of innovative use of big data in the banking sector and concluded their implications for the activation of his societal responsibility. The research concluded that big data represents a fundamental change tool in the banking system, but the maximum utilization of it requires the availability of multiple components (trained human resources), and a deeper trend for using big data is expected in the future.

**Keywords:** efficient banking, big data, economic diversification, sustainable development, societal responsibility.

## Introduction

The effects of big data extend to all sectors and become a trend <sup>[1]</sup>. And a tool to change the course of life in all its aspects and in the banking sector is mostly affected. Big data has changed how financial products and services are produced and presented, and it could completely change the financial landscape. Besides providing customers with better, faster, and cheaper services, <sup>[2]</sup>, which led to an analysis of the areas of its use in the banking sector, although most studies deal with big data from the technical side, it represents an essential organizational resource for service innovation <sup>[3]</sup>. However, it does not mean that achieving positive results through them is much easier, but rather surrounded by multiple requirements and challenges. <sup>[4]</sup>.

Therefore, we examined the areas of the Saudi banking sector benefiting, <sup>[5]</sup>. To activate a cycle in achieving sustainable development and the requirements for achieving that benefit, especially since studies have shown that Saudi banks do not achieve their societal responsibility <sup>[6]</sup> and their limited role in supporting development requirements <sup>[7]</sup>. and because of the growing role of the banking sector in supporting sustainable development goals in the current stage <sup>[8]</sup>, activating a cycle is a basic requirement where the correlation between achieving social responsibility and supporting sustainable development <sup>[9]</sup>, therefore, stems from the importance of research from benefiting of big data as a tool for innovation to develop the performance of the banking sector and activate a cycle in society in the next stage to support sustainable development in the Kingdom, especially since the importance of big data increases with the speed of development in the economic environment in the Kingdom.

### Access this article online

Website: [www.japer.in](http://www.japer.in)

E-ISSN: 2249-3379

**How to cite this article:** Amal Esam Zaki, Mona Fathi Rizk, Mona Mostafa Sakoury, Hana Ahmed Saud Ababtain, Nada AL-Sabti, Lamia Yousif Khalaf Aldossary. Analyzing the role of big data in activating social responsibility, supporting the sustainable development of Saudi banks. *J Adv Pharm Edu Res* 2020;10(1):207-213. Source of Support: Nil, Conflict of Interest: None declared.

## Study literature

The reality of social responsibility in Saudi banks Societal responsibility is a commitment imposed by the rapid global changes, especially with the increase in community awareness, despite the absence of a legal obligation, and this commitment requires the organization to ensure that:

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- The community's need for the service provided and its compatibility with the nature of the organization's work.
- Drawing up various policies and scenarios to achieve social responsibility mechanisms
- Putting the goals of the organization into consideration so that it identifies tasks commensurate with the nature of its activity because it means sustainability for the development and the organization.

By applying the social responsibility assessment indicators to the performance of Saudi commercial banks, it was found that they participated in the areas of their interest in their responsibility towards workers, the environment, and society, which means that they covered the first three indicators.

(Performance towards workers, the environment, society) As for the fourth indicator on the development of production, which involves sustainable development and the provision of services commensurate with the nature of its work, that is based on the idea of responsible investment and linking the social dimension with banking services and products provided by banks, it was found that the activity of the banking sector could not cover the needs of the local economy <sup>[10]</sup>. This prompted the researcher to further study the mechanisms of activating the role of Saudi commercial banks in achieving sustainable development by using big data.

### First: The status of Saudi banks and the available opportunities

The Saudi banking system has several pillars that contribute to increasing its ability, as well as its need, to take advantage of big data (Union of Arab Banks 2017), including

1. It is classified as the fifth strongest banking system in the world due to a decrease in the bad debt ratio of 1.4%, an increase in capital efficiency of 17.5%, and a decrease in liquidity pressure that was exposed to it thanks to the measures of the Monetary Agency to support liquidity and confidence in the banking system.
2. It has high capital and high provisions coverage, both of which exceed the minimum requirements of Basel.
3. The high quality of the assets of banks, despite the slight increase in bad loans. The Saudi banking system is still highly capitalized.
4. The Financial Sector Development Program was launched in 2018 that aims to enhance financial awareness, increase savings and inclusion while promoting financial stability.
5. It recorded the fifth lowest ratio of bad (or irregular) loans to total loans within the Group of Twenty, which was 1.2% at the end of the second quarter of 2016. With its limited external exposure, domestic credit risk is well managed due to high-quality assets and adequate loan allocations. As the coverage ratio of bad loans reached 178% at the end of 2016 (Union of Arab Banks)

6. The profitability of Saudi banks remains high, despite their work in an environment with low oil prices and low-interest rates. The return on assets ratio was recorded at 2.1%, which is the third-highest rate within the G20, and the return on equity ratio was 15.0%, ranking the ninth among the G20 countries. The interest margin to total income increased from 66.5% in 2014 to 67.7% at the end of 2016.

### Second: - The challenges facing the Saudi banking sector

The banking sector has witnessed several challenges as a result of the drop in oil prices and its repercussions that make benefiting from big data analyzes an imperative, including:

1. The liquidity of the banks of the Gulf Cooperation Council countries in general, and Saudi Arabia in particular, was subjected to great pressures as a result of the noticeable decline in deposit flows following the sharp decline in oil prices and the consequent deficit in the budgets of the Gulf countries, where about 90% of their income is from oil exports.
2. The percentage of banks' liabilities in the private sector to total deposits in Saudi banks increased significantly from 79.73% in 2014 to 90.38% at the end of 2016. We also note that the ratio of liquid assets to total assets decreased from 22.3% in 2014 to 18.4% in 2016 as a result of expansion in lending and supporting liquidity in the market.
3. The Saudi Arabian Monetary Agency raised the ceiling for loans to deposits in commercial banks from 85% to 90%, to overcome the lack of liquidity due to the decline in customer deposits, including those of government agencies, as a result of the drop in oil prices.
4. The ratio of foreign assets to total assets decreased from 11.80% in 2014 and 14.34% in 2015 to 11.23% in 2016, which indicates that some Saudi banks liquidated part of their foreign investments to support their domestic liquidity. The Saudi Arabian Monetary Agency also injected financial liquidity into several banks during the second quarter of 2016, intending to manage liquidity in the monetary system. The 2016 Deposit Protection Fund was established to achieve more financial stability, enhance confidence in the banking sector, and reduce liquidity risks. (Financial Stability Report 2017)
5. The financial sector is undergoing a radical change in terms of diversity through the entry of emerging actors (such as fintech companies) to drive innovation and competition, because it is based on the dismantling of financial services <sup>[9]</sup>. The ability to deconstruct services is one of the main factors for growth in the ICT sector. Therefore, the consumer prefers to choose the services they want from a variety of technology companies <sup>[11]</sup>.

These previous challenges reflect the importance of research and the need to use innovative mechanisms provided by big data to

attract deposits, especially savings, and to diversify loan fields and sectors.

6. In addition to the previous challenges related to the nature of the activity and the work environment in which the banking sector operates, there is a group that impedes the adoption of the use of big data, including <sup>[12]</sup>
  - A. Misconceptions about big data organization and analytics, including cultural and artistic aspects.
  - B. The difficulties of outsourcing the use of banks: The main contracting issues that arise between banks and data analysis service providers especially include data protection requirements, liability, etc.
  - C. The conservative regulatory culture of banks and the fear that it will be difficult to regulate financial services may lead to resistance to their use.
  - D. Information technology, security, and legal departments in banks lack an understanding of how they operate in addition to the lack of qualified human competencies to analyze big data and benefit from it.

### Third: The areas where banks benefit from big data

Big data opens new avenues for innovation, competition, and productivity. It is tremendous energy to promote development by creating real-time information, at a low cost compared to other sources <sup>[12]</sup>. Big data technology can analyze data from multiple sources (models/sensors), websites, network data, behavioral and social communication). This allows identifying links between a group of independent data to reveal multiple aspects and thus innovating modern means and creating the appropriate regulatory framework to effectively manage and analyze this data, which enables decisions that lead to improving performance in a way that is directly reflected in stimulating innovation and creativity in the banking sector, as it contains enormous energies and great market capabilities help predict future trends. These forecasts provide the decision-maker with innovative tools to better understand customers and markets and manage risks with higher levels of quality, efficiency, and effectiveness, which allows banks to innovate in its various dimensions (innovation is not limited to designing new products and new methods of providing services, but extends to improving and developing the existing one). Importance in supporting managerial decision-making in the areas of accounting and finance <sup>[13]</sup>. Internationally, banks have begun to use big data to obtain in various areas of their business, ranging from sentiment analysis, product sales, regulatory compliance management, reputation risk management, to financial crime management <sup>[9]</sup>. Therefore, in this part, we review some innovative areas for using big data analyses in the Saudi banking sector, and then conclude their expected implications in support of sustainable development in the Kingdom.

1. Innovating a service: Big data analytics help create new services and develop existing services through

- A. Estimating the demand for new products (personal loans, transfers, deposits, customer profiles) and designing credit facilities that take into account different customer conditions, including loan ceilings.
  - B. Better plan cash flow and demand patterns by analyzing customer cash flow information
  - C. Analysis of the nature of the problems of withdrawing clients enables the identification of the need for better communication or facing a specific problem
  - D. Evaluating the appropriateness of services by analyzing customer satisfaction surveys that contribute to the development of training for the human component as well.
2. For the operational level, the branch's performance is evaluated and insights are obtained to support decisions
    - A. Development of the performance of the banking sector branches. In 1988, the Commercial Bank of Greece (CBG LFA) established performance measurement systems for bank branches <sup>[14]</sup>. The project was implemented by a mixed team of banking experts with the help of academics specialized in developing bank branch performance measurement. During the project (1988-1994) the performance measurement technology was transferred and acquired by bank employees. Several methodological issues emerged during this study regarding the objectives of branch performance evaluation, the importance of (input/output) groups in evaluating the branch efficiency, and the behavioral effects of management control systems.
    - B. Leading businesses toward more accurate analyses of vital information, leading to increased operational efficiency, lower costs, lower risks, faster innovations, and increased revenues.
    - C. Utilizing a large amount of data available to them, such as spending habits and saving methods, and using software and algorithms to analyze them and obtain appropriate decisions to provide smart solutions and services to their customers. Until now, the banking sector has not fully benefited from this revolution, despite the continuous attempts of digitally developed banks to benefit from it, for example, American banks have more than an exabyte of data stored about their customers in their systems and it has not been properly utilized yet.

Risks are potential future events that may expose the bank to unforeseen and unplanned losses and increase its risk due to the acceleration of the pace of integration between global financial markets and the increasing innovation of financial instruments. Therefore, risk management aims to reduce the cost and protect its assets from market variables and fluctuations to achieve the objectives of the banking sector, and there is a statistically significant relationship between the development of risk

management and the protection of the bank and the client's work. Risk management is one of the most important challenges facing the banking sector, and risk management can be developed by making use of big data analysis, which achieves two aspects.

The first aspect: the possibility of measuring, monitoring, and controlling risks, thus forming a clear future vision that defines the work plan and policies.

The second aspect: Understanding the positive and negative aspects that affect the work of commercial banks, increasing the chances of success, and reducing the chances of failure in commercial banks.

One area in which the banking sector benefits from the huge data is to manage risk.

### 3.1 credit risk

Analyzing big data can monitor the main events of borrowers that may indicate the potential for default, such as payment history, borrower behavior, and other data capable of contributing to study the behavior of the potential borrower guided by bad loan ratios.

### 3.2 Pricing risk

The prices of banks' assets change based on the forces of supply and demand and the prevailing conditions in the markets in terms of inflation and recession. The securities portfolio is one of the most affected assets, as it consists of stocks and bonds that are highly sensitive to market fluctuations and big data has a major role in assessing risks in financial markets by providing key solutions to address or monitor fluctuations in financial markets around the world, which is related to banking activity as well. The degree of risk in the financial system can be measured, and the contribution of any financial institution to the overall risk provides a new method for analyzing and managing systemic risks.

### 3.3 Market risk:

There are losses related to revenues that affect the bank's returns, its capital, or its ability to conduct its business as a result of fluctuations in exchange rates, interest rates, financial markets, and fluctuations in commodity prices. Big data provides information useful in forecasting returns and their trends, which contributes to developing appropriate mechanisms to deal with them.

## 4 Security and fraud

Understanding the spending habits of each customer makes it possible to know that any unusual process is taking place. What is happening now is banks freeze credit cards when they are used for a new location or unlikely purchases. But analyzing big data by analyzing the spending habits of the business compared to other customers with the same income and spending habits to better understand the behavior, banks can prevent fraud, especially with the development of e-commerce, analyzing

customer data, and understanding their behavior has become a necessity.

For the Queen, the massive campaigns through the network of bank branches, or payment systems, telephone banking, the express system, automatic points of sale, and other related procedures and mechanisms, surrounded financial fraud and made it to its minimum levels. So the number of complaints received during the 10 months from the beginning of 2017 until the end of it reached 168 complaints compared to 4000 in 2015 due to the spread of awareness and the promotion of a culture of fraud protection.

## 5. Personal offers

The use of big data technology limits the public offers from banks to attract new customers to them and the trend towards providing personalized offers to the individual that are tailored to suit their needs. Based on the analysis of customer details, spending habits, and available data, current applications focus on the marketing aspect. When call centers, customer studies, and social media provide potentially valuable and important information that can be exploited,<sup>[6]</sup> and the huge amounts of data<sup>[15]</sup> help the banks to know their interests and direct offers accordingly, which is reflected in the ability of banks to attract long-term private deposits, which is what Saudi banks should seek to stimulate savings and reduce consumption. Saving does not exceed 2% while the target is 10% (Vision 2030)

## 6. Customer service

Big data technology depends on accurate analysis of data and linking it in a way that reduces the relationship to obtain information. In customer service, banks will be able to identify problems for each customer and solve them on the spot. Through the interaction of the bank with each customer, with the correct use of big data, the bank can identify the problem in real-time and solve it in a quick time.

Big data is of great importance as it provides a high competitive advantage because it provides a deeper understanding of its customers and their requirements and this helps to make appropriate decisions more effectively, based on information extracted from customer databases, thus increasing efficiency and profit and reducing losses, it will help to make more informed decisions about customer preferences, how to target them, the price-setting system, what products and services to be offered, the risk management mechanism, the method for selecting employees, and so on.

## 7. Supporting the competitive advantage based on the information generated from the big data analysis

- A. Discovery of untapped opportunities and weaknesses, as banks can prevent potential fraud operations in all their businesses, which enables them to find solutions to what they reveal of potential problems
- B. Increasing the opportunity to compete for more levels of excellence that enables better services

- C. Identify the sources of defects and improve operations in all business units
- D. Increasing the chance of making clear and correct decisions and increasing the predictability of planners.

**8. Maintaining customer confidence in facing the challenges of the digital revolution, and big data can contribute in several ways, including:**

- A. Reconsider their traditional business models and operational tools by adopting new technologies and making use of existing data resources. Although customer data is not as dynamic as payments data, banking systems can be linked to other details about the customer, such as payments and credit history; To enhance analytics and provide more appropriate individual offers than group offers by categorizing customers according to their preferences, and products by customers.
- B. Use of customer complaints records to identify and remedy problematic processes for customers, and these records provide a source of access to information <sup>[16]</sup>. About frequent customer sentiments and patterns, making it easier to introduce new, more appropriate products.
- C. Promoting the use of mobile phones; facilitating payments, financial transfers, and managing accounts; and providing distinctive means to manage budgets, and advice to customers to manage their money effectively.

**Fourth: The expected implications of using big data in the banking sector**

If big data is used and analyzed in a way that it is previously analyzed, then this is reflected in the achievement of several goals that support the social responsibility of the banking sector and thus support sustainable development, including:

- 1/7 Activating its role towards small and micro enterprises
- 2/7 Enhancing its ability to achieve financial inclusion
- 3/7 Increase in the volume of savings and time deposits
- 4/7 Directing investments first in the country and then to sectors that support development

In addition, the consequences of increasing the bank's profits and achieving the goals of the shareholders and employees are as follows:

**Activating its role towards small and micro enterprises using big data.**

Many studies have proven very humble in the contribution of Saudi commercial banks in supporting small projects that are considered one of the pillars of economic and social development and an effective tool for achieving economic diversity in the Kingdom. Interpreting and predicting customer behavior is radically new. <sup>[17]</sup>. Artificial intelligence (AI) algorithms play a pivotal role in transforming business intelligence into a fully predictive probabilistic framework

The science of big data, data and data analysis, mainly focuses on collecting the largest amount of data and arranging them in a fast and easy-to-access structure, then on understanding patterns and processing them on a larger scale using artificial intelligence techniques, gathering a large number of information related to a person, his university records, Bank balance, internet browsing history, purchase history, places he frequents, social media, close friends, income, age, location and information about the consumer system; Then, the person will have a personal profile showing his/her handling of matters practically and psychologically, and artificial intelligence algorithms will be able to predict their creditworthiness <sup>[17]</sup> and linking the past credit history of people with their presence on social media will improve the credit rating system. It also allows lenders to extend credit to individuals and companies who may not get credit, thus large data eliminates bias resulting from decisions resulting from limited information. The lack of accurate individual data led to the discriminatory rejection of applications for loans, a practice that continues in commercial banks on the pretext of securing depositors' money. The standardization policy led to not granting credit to a basic segment to support the community (small enterprises) and using these mechanisms enables the banking sector to achieve development goals by raising its contribution to financing small and medium enterprises to reach 20% in 2030 compared to 2% currently.

**Promoting financial inclusion:**

Despite the increase in the percentage of those who have bank accounts as an indicator of financial inclusion to reach 74%, big data can achieve two goals, the first is to increase the percentage of financial inclusion by attracting new clients to deal with the banking system, and the second to activate financial inclusion is not limited to opening accounts only, but dealing with the banking sector (deposit, borrowing) and big data, this is achieved efficiently and effectively by analyzing the customer data available to him, their behavior and areas of withdrawal from their account to present to them offers that suit each category separately, which ultimately achieves the promotion and activation of financial inclusion in the Kingdom, especially in connection with the support of financial stability.

**Attracting long-term savings and deposits**

Interest-free demand deposits accounted for 63% of total deposits, of which 94% were institutional and individual deposits, and declined to 61.7% in 2017 (the 2018 Monetary Agency Report). Savings deposits finance economic development and support economic activity, and with the innovative tools previously presented, big data and their analysis can be through income, areas of spending, patterns, plans of the customer, etc., the tools that suit the customer can be directed to attract long-term savings.



## Directing investments first to the interior and then to sectors that support development:

The banking sector is looking for other opportunities and means for its activities in foreign markets to invest its deposits in short-term investment tools with a guaranteed return, and for investment inside, the short-term credit has held the largest share of bank credit on the term, 49.7% of the total bank loans. Trade on the largest percentage of the credit granted to the basic sectors of the economy at the end of the second quarter of 2016 (20.7%), followed by the industrial and production sector (12.7%), the building and construction sector (7.9%), and the services sector (5.5%).

Big data analytics provides risk management and thus provides better opportunities for investment at home, which contributes to creating job opportunities and increasing domestic income and thus supporting sustainable development and allows investments to be directed to areas that support growth rather than financing consumption.

## Fifth: - Requirements for taking advantage of the opportunities available to banks to use big data:

Big data analytics have the potential to reduce customer acquisition costs by 47% and boost revenue by about 8%. However, the value companies perceive from big data investments depends heavily on the capabilities available <sup>[18]</sup>, requires generating the benefit or added value from big data has several requirements in two aspects:

The first aspect is to determine the goal of processing this data, as there is no single use of the data. In fact, there is an enormous number of uses for the data, and the efficiency lies in knowing the most appropriate model that generates the most return from that use. There are three levels of use (operational, tactical, and strategic).

The second aspect is the development of the processing process itself over traditional data processing. So a new science has been developed, which is data science. This science goes beyond the traditional assumptions of economic theory in terms of assuming linear relationships between variables and a full rationalization of people, which resulted in increasing the predictability of its models

Although 80% of banking data is unstructured, many data management techniques are still being used in rare cases for several reasons including limited access to large banking data, shortage of skilled workers, lack of advanced analysis tools, restrictions imposed on the confidentiality of bank data

Taking advantage of the available opportunities accompanies a set of requirements that must be considered to maximize opportunities. So, it is imperative for banks to:

1. expand the use of big data analytics to confront bank fraud, financial breaches, and banking and financial stumbling, and to maintain customer confidence in facing the challenges of the digital revolution, especially as it creates

an atmosphere of customer discomfort and then the transformation to competitors (Fintech).

2. reconsider traditional business models and operational practices, as some banks have already started the digital transformation by adopting new technologies and making use of existing data resources to develop better products and services. Big data and its analysis are a solution to restore customer confidence and keep them in the face of the turmoil of the digital revolution despite that its full potential remains untapped.
3. take practical steps towards transforming the obstacles of customer perception into business opportunities, by relying on big data. Through the payment data, it is possible to determine consumption and saving patterns.
4. boost analytics and create better and more successful upcoming business propositions although customer data is not as dynamic as payment data, and despite that, banking systems can be linked to other details about the customer, such as payments and credit history.
5. Concerning the prosperity of fintech companies, "Fintech" banks have the resources and capabilities that enable them to maintain their position in a way that startups do not possess; but it needs to study Fintech's thinking. In addition to doing some things such as disaggregating data according to recommendations and findings, customers can be grouped according to their preferences, and products can be grouped according to customers.
6. audit payment and behavior data; payment data help banks understand the sequence of events that lead to a customer leaving the bank. Although banks are adept at regulatory compliance and mitigating fraud, they need to start getting better results in the behavioral analysis that big data enables them
7. use customer service data records to identify and fix problematic processes for customers. Call center records and complaint records can be a source of access to more information. Frequently analysis of customer sentiments and patterns enables to introduce new products.
8. improve the mobile phone experience, as many banks have applications for mobile services, but they usually focus on facilitating payments, money transfers, and account management. While an application can be available to provide the user a unique means to manage budgets and to provide useful advice, through the use of big data and the available information.
9. develop an integrated strategy for digital transformation, and develop long-term relationships with its customers, based on big data.
10. Development of human cadres capable of dealing with the development of economic conditions, customer needs, the bank's objectives, and responsibilities, and thus can employ their data needs due to the heterogeneous nature of the skills required in the professions of big data analysis <sup>[19]</sup>. Establishing a clear classification of job roles and

skillsets can support the development of clear strategies to acquire and develop the appropriate skills needed to take advantage of big data.

11. Banks are aware of the opportunities big data can be provided. However, the biggest challenge is to start taking advantage of these opportunities, especially since unstructured data makes up at least 80% of all George *et al.*'s (2014) data <sup>[7]</sup>.
12. The fundamental importance of big data is to help it excel and compete and this calls for institutional transformation at multiple levels and other driving forces that are not resistant to change <sup>[10]</sup>. Organizations often lack organizational and structural aspects during the initiation and adaptation phase to exploit the full potential of big data in a long term.

## Conclusion

The research used the deductive approach by analyzing and concluding innovative services through which Saudi banks can activate their role in supporting sustainable development. Through the advantages offered by big data, analyses including speed in service provision, inclusiveness, and diversity, individuality as an alternative to general services, allow achieving inclusiveness and increasing loyalty. The research used the deductive approach by analyzing and concluding innovative services. Therefore, Saudi banks can activate their role. Big data represents a fundamental change tool in the banking system, but the maximum utilization of it requires the availability of multiple components (trained human resources), and a deeper trend for using it in the future.

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