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## BIG DATA, CUSTOMER CENTRICITY AND SUSTAINABILITY IN THE BANKING INDUSTRY

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big data, data analytics, customer-centric, sustainability.

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# BIG DATA, CUSTOMER CENTRICITY AND SUSTAINABILITY IN THE BANKING INDUSTRY

## Abstract

Due to the huge progress in technology particularly the internet, people around the globe are generating huge amount of data that reflects their personal and unique behaviors. The analytics of big data that has facilitated capturing this rich data on customer in real time helped shifting the business model of banks towards customers. In parallel, nowadays customers are more aware of the need to safeguard the planet for the future generations and are exerting pressures on businesses including banks to become green and sustainable banks. Although banking industry has adopted sustainable development to save its reputation globally that has been hit by recurrent financial crisis. However, banks strategies on sustainability do not focus directly on customers. The aim of this paper is to introduce and define big data, customer centricity and sustainability in the banking industry and map the need to leverage on big data and intertwine sustainable perspective to personalized services and marketing function by Lebanese banks to be able to survive fierce competition and to move towards customer experience management that ensure banks sustainable competitive differentiation needed to achieve sustainable performance and growth in an era of digital transformation that may disrupt the industry business model. This study developed a framework that introduces a relationship between big data, data analytics, customer centricity, sustainability and performance for Lebanese bank.

## Keywords

big data, data analytics, customer-centric, sustainability.

## 1. INTRODUCTION

Albeit it has a variety of defections (Ward & Baker, 2013) big data is more just another slogan: it is definitely a conceptualization that has penetrated both our personal and professional lives. Big data is a direct repercussion of the Internet especially the Internet of Things (IoT) (De Mauro et al., 2016).

The term Internet of Things was initially given in a presentation to Procter & Gamble (P & G) in 1999 by Kevin Ashton, co-founder of the Auto-ID center at MIT. The IoT makes it possible to connect people and things anytime, anywhere, with anything and anyone ideally using any network and any service (Patel & Patel, 2016) leading to the introduction of internet of everything (IoE) which is a broader concept of IoT. Cisco introduced IoE as a network that brings together people, process, data and things providing valuable information that leads to the creation of new capabilities, richer experience and considerable business opportunities.

Nevertheless, billions of people worldwide are generating huge amounts of data through the ongoing use of Facebook, twitters and other social media posts in addition to hardware devices and business transactions. In 2010, Thomson Reuters estimated in its annual report that it believed the world was “awash with over 800 exabytes of data growing”. One exabyte of data is equivalent to 1 billion gigabytes (GB). The main characteristic of Big Data is hence the sheer volume. No one can pin down how much data is being generated, but the amount of information collected is enormous.

With the exponential growing volume of information, one big question is how to deal with these huge amounts of data? This is where Analytics become handy. Big data analytics (Chiang et al., 2018) is concerned with applying appropriate algorithms and processes to derive value by running through multiple data sets. Value is about the meaningful correlations between them and using this information for a particular objective. Big data analytics provide opportunities for transforming decision-making and strategies and offer great benefits and promises (Schoenherr & Speier-Pero, 2015).

The use of Internet and IoT in the banking industry, such as mobile banking, online banking, demonetization and digital banking, has set an ongoing avalanche in the number of transactions and has led to the generation of huge amounts of data (Bedeley & Iyer, 2014) on which banks are leveraging to provide customers with a reliable and personalized experience. Thus, banking industry has moved towards customer-centric approach in order to ensure economic growth and competitiveness. In parallel, banks are being under increasing pressures to become green and sustainable in response to shifting customers' behavior that are paying higher importance on banks' social and environment activities.

This paper tackles how big data facilitated the shift towards customer-oriented banking services without forgetting the issue of sustainability which becomes a major concern of customers. The remaining of this study is organized in 3 main sections: Section 2 defines and exposes big data and customer centricity and sustainability. Section 3 introduces the conceptual framework that interrelates between big data, customer centricity and sustainability on the performance of Lebanese banks. Finally, section 4 shows the main conclusions of the study.

## 2. BIG DATA, CUSTOMER CENTRICITY AND SUSTAINABILITY

### 2.1 Big Data

Data is being created and multiplied with an incredible speed due to the capabilities offered by the rapid evolution of technology. Data are being collected from social media streams, web surfing, digital images, banking transactions records, emails, mobile applications and countless other sources (Research- Technology Management, January- February 2013). The amount of information available in the world has been growing exponentially and passed from 150 exabytes (an Exabyte is a billion gigabytes) in 2005 to more than 800 exabytes in 2010 (De Abreu Faria et al., 2013). This flow of data is expected to accelerate more with 44 times more data expected to be generated in 2020 (Gobble, 2013).

This huge amount of data is the cornerstone of the Big Data paradigm. There exist a number of definitions for big data were found in the literature. Section 2.1.1 explores some of them.

### 2.1.1 Big data different definitions:

1. Large amount of data that cannot be managed nor processed through the use of traditional data management techniques”
2. Big data means really huge data quantitatively: it is the collection of large datasets that cannot be processed using traditional computing techniques. Big data is not merely data; rather it has become a complete subject, which involves various tools, techniques and frameworks (Siddiqui & Qureshi, 2017).
3. Big Data when conventional systems are unable to handle it. Bigness is not just about size- data may be big because of its:
  - a. Volume: there is too much of it.
  - b. Velocity: it is moving too fast.
  - c. Variety: comes in different and usually unstructured forms.
 And increasingly, “the rise of big data is intimately connected to the advent of what some call the “Internet of things” (Gobble, 2013).
4. Big data is more than just another buzzword: it is indeed a conceptualization that has penetrated both our personal and professional lives. Big data is a direct repercussion of the internet especially the Internet of Things (De Mauro et al., 2016).
5. One interesting view of Big Data comes from (IBM), see figure 1: Big data analytics gives the ability to deal with high volumes, velocities, varieties or veracities of data. More holistic view of different time-scaled information is provided with High data volumes. Information in continuously updated for reactive decision making with high velocities. A more nuanced view of a subjected can be provided with high varieties of data. Data consistency, truthiness and hence trust in data is the outcome of high data veracities.

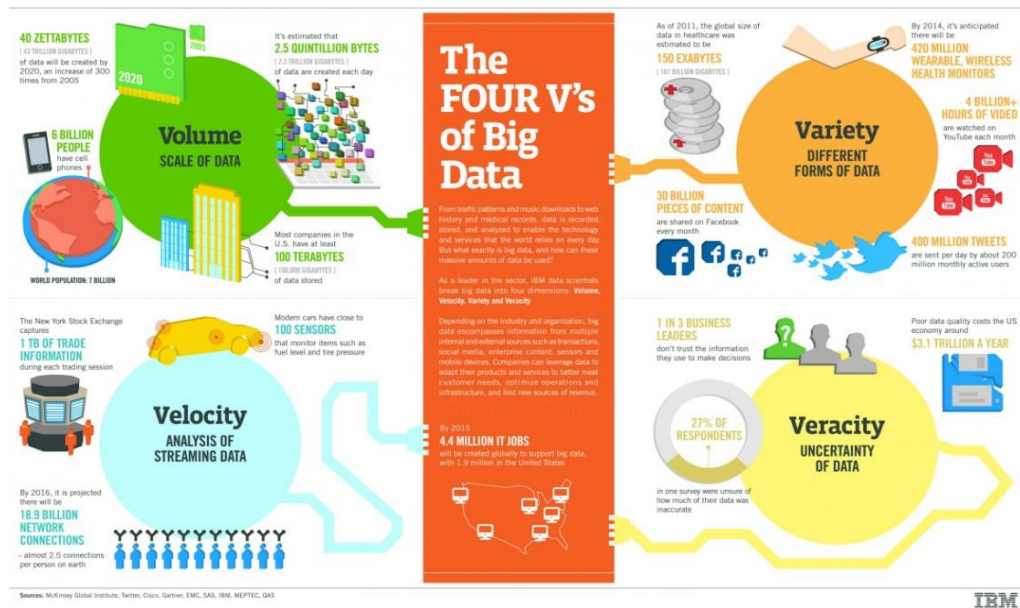


Fig.1: The four V's of Big Data according to (IBM)

Big data is not only limited to volume, variety, velocity and veracity as per IBM definition but it additionally includes other characteristics such as value, validity, variability visualization and volatility (Owais & Hussein, 2016) that provide comprehensible data on customer vital for promoting customer centricity.

6. As the tool which allows an organization to create, manipulate, and manage very large data sets in a given timeframe and the storage required to support the volume of data characterized by variety, volume and velocity (Srivastava & Gopalkrishnan, 2015).

### 2.1.2 Typology of big data

The Oxford Dictionary defines Data as: “Data is the quantities, characters or symbols on which operations are performed by a computer, which may be stored and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media”.

“Big data is “extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions”.

1. Big data is the huge amount of information that is a direct repercussion of the internet especially the Internet of Things (IOT) (De Mauro et al., 2016).

Big Data is a relatively new term that describes the enormous amount of information coming from the massive use of technology, such as mobile and internet use, pictures, e-mails, databases, multimedia, machine to machine data (smart homes, smart cars) in addition to the businesses daily transactions. The increasing number of users of multiple technology products has increased the flood of data to an unprecedented speed and has generated different types of information: structured data which is regular numeric data in traditional databases and unstructured data coming from texts messages, email, video, audio stock ticker and financial transactions (Erevelles et al., 2016).

Gathered data in its natural form is usually meaningless and need to be processed to become of value (Owais & Hussein, 2016) and information is classified big when it cannot be processed through the traditional systems from where the urge to use new data analytics to process and analyze big data. Analysis and processing of big data need to be done through non-conventional data management techniques.

Moreover, generated data cannot be verified at the source which may lead to mistakes in final results from the need to have accurate and truthiness information to deliver expected real time solutions (Erevelles et al., 2016).

### 2.1.3 Usage of big data in the banking industry

Digital data has snowballed, with the explosion of the internet of things, internet, smart phones and other devices (Siddiqui & Qureshi, 2017). People in institutions started to realize the massive potential of using this information to drive the organization growth and efficiency, in addition to create real value for customers (Tripathi et al., 2021). In our time, Data has been considered as essential as oil to businesses and the fourth factor of production like land, labor and capital (Bank, 2014). Thus, big data has become the key driver for institutions that rely on the value produced to improve customer satisfaction and personalized offerings.

Most of financial institutions (FI) and banks, due to their business nature, have been generating and handling huge amount of data from several sources (point-of-sale, electronic data interfaces, ATM machines, internet and mobile banking transactions, social media etc--) for many decades (Srivastava & Gopalkrishnan, 2015). The banking industry is one of the big players in the big data generation. Banks contribution in big data is clearly reflected in its Vs characteristics as follows:

- a. Variety of structured and unstructured data processed by the banks ranging from transactions history, online and mobile baking passing by the points of sales to credit scoring and various reports on risks and audit.
- b. Velocity or speediness new data is added to banks' database such the enormous number of transactions executed per minutes resulting from the use of different banking products. Online and mobile activities and transactions have increased lately and time to produce the same volume of information (5 billion GBs) went from days (2 days) in 2011 to simply minutes in 2013 and expected to decrease more coming forward (Chandani et al., 2015).
- c. Volume: space needed to store the produced data is increasingly growing due to the use of different forms of data such as swift messages, emails, PDF, and images exchanged.

However, the big data either acquired from external sources or generated internally needs to be refined to become valuable for the users of which the banking industry. Banks need to align the use of big data with the organization mission and vision and invest in innovative infrastructure to optimize its benefits from big data. Given that institutions need innovative tools to process this information to improve insights and decision making (Chakraborti, 2019).

Big data analytics has found echoes within the financial firms particularly banks. As the number of electronic records grows, big data analytics has allowed banks to store data, analyze huge amount of information in a rapid time (real time), derive business insights and provide banks with the potential for new significant offerings (Srivastava & Gopalkrishnan, 2015). Banks need to formulate strategies and policies that base decision making on big data analytics and not on intuition (Chandani et al., 2015). Strategies should take advantage from the big data analytics regarding the following:

- a. Better management of risks and fraud: banks are able to identify potential risks linked with lending processes. Big data can allow reduction of data entries errors. Big data applications can also limit the number of fraudulent or suspicious transactions and detect money-laundering transactions.
- b. Finding out the root cause of issue and failures.
- c. Customizing products and customizing marketing communication by sending individualized messages on offers that are relevant to the specific customer.
- d. Customer segmentation, customer centric, customer retention, cross selling and up-selling activities. Big data allows a new segmentation approach of the customers based on their behaviors and spending patterns which in turn allow strengthening customer centricity. Proposing personalized services will improve customer experience that leads to customer loyalty materializing in customer lifetime value (Tripathi et al., 2015).
- e. Optimizing human resources by reducing to the minimum bad hiring and empowering the front line contacts with the customers.
- f. Leveraging on internal data coming from the banks' financial statements; external data generated from e-mail exchanging, telephone banking operations, internet and mobile transactions and ATM operations; and from social media data that emanate mainly from Facebook, Twitter and LinkedIn and from different search engines (Chakraborti, 2019).
- g. Effective customer feedback: internally through the bank's customer support units or on social media platforms, banks will succeed in retaining customers if latter feel that their feedback was valued.

Big data, however, has a number of challenges as well, and the banks need to ensure that the following challenges are managed to eliminate any negative impacts on its strategy to adapt big data analytics to overpass a stiff competition not only locally but on an international scale (Chandani et al., 2015) and by new comers such as fintech companies.

Siddiqui & Qureshi (2017) listed some of the challenges as follows:

- a. Legal and regulatory challenges. The role of legislation and regulatory bodies are very sensitive because from one side they need to develop data usage and in the same time protect exploitation of information by criminals that may cause substantial losses.
- b. Privacy and security challenges. Security is becoming a hot topic with big data since smart products have evolved to almost everything around us (smart cars, smart homes) and any mobile terminal is lost or stolen will cause serious harms to the end user. Privacy is also an important issue because customers do not like to provide very intimate information.
- c. Organizational mindset. Organizational siloes need to be broken to upmost benefit from the available information.
- d. Data quality, visualization and integrity. Usually information cannot be screened effectively, thus wrong data will certainly lead to invalid results.
- e. Inefficient data management. Banking industry which infrastructure is old needs to invest in new innovative tool to analyze and interpret data since an inefficient data management will lead to potential loss of the benefit from data insights.
- f. Compliance

Banks need to put strategies that take advantage from big data and in the same time manage successfully the many challenges it presents. One of these challenges is how to generate effective business value and obtain competitive advantages from analytics. The challenge for the banks is how to use data regarding who are their customers, where they live and what they do or at least what they do with their money in support of their customer base. Banks also face the challenge on how to handle huge volume of complex data in efficient and cost-effective way (Sun et al., 2014). Another challenge is added being the privacy and the use of personal data. In general, customers are reluctant to share intimate and sensitive personal information because they are afraid that their data are hacked.

The digital era has opened up new ways to engage with audiences and customers quick and in control of their journey become more exigent. Nowadays, banks' customers' expectations have increased tremendously due to the massive customized services of digital disruptors and consequently personalization becomes crucial for banks. Banks cannot compete using the same old ways of marketing campaigns and traditional techniques of targeting customers. For several decades, the majority of the banks used to distribute customers into different groups based on criteria like geographic location, demographic factors (gender, age), occupation and financial parameters (credit rating, asset levels, liabilities etc--). The standardized model of marketing segmentation and the one focusing on selling more of specific product (one size fits all philosophy) will fall short in favor of the rise of life style and interest behaviors and many other deeper insights on customers based on predictive analytics (W.Up, 2019).

Today, banks are competing intensely for customers who are expecting their banks to involve them at their "point of life" with appropriate offering and advices.

Due to the increasing number of customers favoring digitization, personalization and given the fierce competition from digital institutions and banks, the banking landscape is changing and the traditional banking methods are under the threat to becoming obsolete. Ultimately banks have to adapt their business model to align with customers' new expectations and to ride the big data wave; otherwise, banks in their present form will become obsolete and their business model will be disrupted.

## **2.2 Customer Centricity**

The availability of choices accompanied with the decline in customer loyalty has urged institutions to rethink their customer centricity approach and to provide their customers with what they want, when and where they want it (O'Byrne, 2017).

### **2.2.1 Definitions of customer centricity:**

1. Customer centricity is a strategy applied by an organization using technology to collect information on customer throughout the organization and using intelligence about the customers to be able to understand the current and future needs of customers (Ambaram, 2013).
2. Customer centricity as an approach that places the customer in the middle of business philosophy, operations or ideas. Customer-centric businesses consider that customers are the main reason for their existence therefore all means are deployed to keep client satisfied (Investopedia).
3. Institutions moved from product-centric or brand-centric and focus on the customer who is considered the most important stakeholder (Jirinova & Kolis, 2013).

### **2.2.2 Conceptualization**

According to the above definitions, the rapid advance in technology and the higher expectations of customers who are different with particular needs and preferences have heavily impacted the business model. Today customers are looking for a more tailored and individualized experience given that their sense of loyalty has fallen. Businesses realized the urge need to switch from product or service-centric to customer centric approach since the customer is behind their presences. To remain competitive and economically efficient,

businesses have to fulfill customers' needs and satisfy their increasing expectation requirements in the way they like it and not in the way the business see it. To be able to better understand their customers and satisfy their needs in real time, businesses need to take benefit from the skyrocketing available information (Tornjanski et al., 2015).

### 2.2.3 Factors affecting customer centricity

The move from product to customer centric approach was enabled due to the following three factors (Ambaram, 2013):

- a. Technological factors which use big data to address (1) customer relationship management systems that allow the building of a single view of a customer and (2) customer data and analytics for instance transforming collected data into executable actions.
- b. Customer factors that comprise (1) customer needs not only for the present and (2) lifetime needs, (3) customer loyalty and (4) customer experience journey. Creating a positive customer experience is key in customer-centric approach and enables a company to differentiate itself from competitors who do not offer the same experience.
- c. Organizational factors consist in: (1) customer segmentation and not market segmentation based on behavior and value and not in demographic distribution, (2) customer value or profitability including customer loyalty, (3) customer touch points where consistency should be the same across the whole organization or touching points and (4) delivering integrated solution instead of individual products.

## 2.3 Sustainability

### 2.3.1 Definition of sustainability

Sustainability connotes the concept of securing the present without compromising the future (Pardo-Jaramillo et al., 2020). This concept that has developed in the late eighties of last century aims at preventing the sudden and uncontrollable collapse of the world (Pardo-Jaramillo et al., 2020). Thus, the definition of sustainability involves the three dimensions of economic, environmental and social responsible initiatives (Sheth et al., 2011). For instance, sustainability in the banking industry includes creating value for shareholders, while respecting the environment and social development (Korzeb & Samaniego-Medina, 2019). Consequently, the assessment of business results should not only focus on economic performance but also take into account the social and environmental influence.

### 2.3.2 Sustainability in Banking Industry

According to Tu & Dung (2017), Korzeb & Samaniego-Medina, (2019) banks involvement in the sustainable development is achieved by including environmental and social responsibility in their operations through environmental initiatives (such as recycling and energy efficiency programs) and socially responsible initiatives trough involving in social and cultural sponsoring activities (such as cultural events support, human resource practices improvement and charitable donations); Furthermore Tu & Dung (2017) added that sustainable development is also achieved through integrating the concept of sustainability into core businesses (such as integrating environmental norms into lending and investment policies and developing new products that facilitate access of capital to environmental businesses).

## 3. CONCEPTUAL FRAMEWORK FOR LEBANESE BANKS

### 3.1 Intertwining Big Data, Customer Centricity and Sustainability in Banking Industry

#### 3.1.1 Big Data and Customer Centricity

Technology and communication advancement, combined with the explosive growth in information, have given rise to a more empowered global customer (EY). Nowadays, customers have different higher expectations given their geographically diversification and demographically variation. For example, in developed countries, the customer expectation of the aging population that is heading toward retirement is not the same as the new generation of customers raised on technology that is coming of age. In addition, mobile workforce has been introducing new purchasing behaviors across different geographic



regions and switching needs and behaviors. Thus, satisfying more complex customer expectations is becoming more complex.

Customers who are looking for a more personalized and rich experience (Tripathi et al., 2015) become quickly frustrated from the businesses that overlooked their expectations and are ready to leave even more often than finding a better price or service somewhere else. Therefore customer centricity becomes vital given the continuous drop in the cost of switching even for the strongest corporate brands which are also vulnerable (Marous, 2017).

Banks' customers are no exception; banks are requested today to provide more personalized timely and relevant communications and offers to drive customer's satisfaction and loyalty (Marous, 2017). In effect, customers' expectations have risen and customers are expecting from their banks the same experience that they receive from financial technology institutions and from the latest application-based innovation. Like other businesses, banking customer centricity need to be enforced in bank's strategy and align business objectives to changing customer expectations; millennials for example desire from their banks to provide them with information and advice and not only to offer them transactional relationships (Beatty, 2018).

Banks need break the siloes and to spread customer-centric philosophy across all organizational level and empower employees at touching points to be effective and create the required personalized customer experience journey (Indriasari et al., 2019).

Customer centricity in banking is not fully implemented since most of the banks are still applying the generic solutions that lack relevance and context for targeted customers. For example, the banks' agents promote the same mileage rewards credit cards to all the clients without really understanding whether this product add value to this specific client (is the customer interested in travelling or no); these promotions are related to the banks' desires to sell more of a particular product (Beatty, 2018). Digital technology and advanced data analytics help banks to improve customer expectation by envisaging customers' financial behaviors and offering them appropriate tailored financial product that fit them at the right moment (Beatty, 2018; Marous, 2019; Indriasari, 2019). For example, if a bank's customer purchases at a shopping mall, his bank can provide him with real-time offers that are related to his spending patterns and offer him discount at his favorite store.

Churning the massive amount of information into actionable insight allow banking sector to move one step forward in customer-centric approach and reach the "segment of one" which is an advanced level of personalized experience where needs are matched to solutions in real time (Marous, 2019). The use of advanced analytics and personal financial management enable banks to meet each of their customers at his point of need and to provide him with financial advice and suggest solutions. Enhancing and supporting customers at the personal level will lead to increasing customer satisfaction and consequently pave the way for customer loyalty and retention (Tripathi et al., 2015).

To meet the skyrocketing customers' expectations and their increasingly complex perceptions in addition to the shift in power from providers to customers, successful institutions have switched from the focus on customer relationship management to embrace customer experience management considered as sustainable source of competitive differentiation (Holmlund et al., 2020). Customer experience management which is crucial for institutions to sustain long-term customer loyalty analyzes the behavior of customer by analyzing customer's data pattern collected from the multiple channels used and not only restricted to the service provider channels (Holmlund et al., 2020). Furthermore, these successful institutions have been employing a global perspective (what do customers really think?) and innovative channel strategies (how do customers want to be reached?). They have been providing an end-to-end experience that reveals a universal and multidimensional view of the customer rather than internal structures and organizational complexity (they see their business through the customer's eyes). For instance, big players in electronic commerce and social media are developing marketing strategies that are oriented towards hyper-personalization or "the advanced and real time customization of offering, content and customer experience at an individual level" or segment of one (W. Up, 2019). They actively change their pages based on customer's behavior. For example Amazon monitors in real time what a customer is viewing or buying and dynamically modifies its page to feature applicable items. By doing so they are able to reach the right customers at the right times in

the right channels, they engage in a mutual exchange of information and deliver appropriate customer experiences that achieve the brand promise and create trust and long-term loyalty.

Competition is intensifying in the banking industry; in addition to the traditional players, competition now comes virtually from any region of the world and from nonbanking institutions (Fintech). Therefore, the ability to provide a differentiated and satisfying customer experience may create competitive advantage and capitalize on opportunities for profitable growth for institutions (Indriasari et al., 2019). Businesses create customer trust and loyalty by designing highly relevant tailored customer experiences that reveal a profound understanding of preferences and intentions of specific customer segments and by considering various customer values (timeliness, trustworthiness and suitability as well as price instead of focusing on one component, such as price, at the cost of the others. Thus, a trusted relationship will always remain a distinctive differentiator and will translate in profitable one.

Banks having big reservoir of data need to follow this path and analyze all available data whether structured or unstructured, from internal or external sources to digest user behavior. This will allow a better understanding of the customer perceptions and use these data insights to find new ways to cater to his needs to optimize customer experience and journey accordingly and create individualize customer experience (Indriasari et al., 2019). Personalized experience makes customers feel special, unique and happy and consequently banks will be happy (Tripathi et al., 2015). From where the urgent need for banking to increasingly consider customers, adjust to their preferences by providing timely personalized and appropriate communications and offerings that drive customer profitability, happiness and long-term loyalty (Tripathi et al., 2015).

The fast advance of communication technology and electronic commerce has ruined customer loyalty by eroding intermediaries and creating more suitable access to product information, purchase options and services.

Bank's marketers need to forget about using the same old-fashioned data sources and marketing process and to create omnichannel customer experiences (Marous, 2017; W.Up, 2019).

Nowadays, the customer's purchasing practices become unpredictable. Customers typically start using one channel and shift unpredictably to other channels due to personal circumstances (Marous, 2017).

### 3.1.2 Customer-centricity and sustainability

Banks have enormous reservoir of information collected from their daily operations and from external sources (social media) (Indriasari et al., 2019). The big wave of the technology advancement that obliged banking industry to ride the wave of change and adapt their model around technology products which moved banking operations more and more towards digitalization that started earlier, first, with the ATM than mobile banking and evolved further to the mobile and banking online. The digitization of the banking industry is generating a huge amount of data in different forms (structured and unstructured) and the data growth stream is expected to exponential going forward due to the shift in customer preferences (millennials) from face to face to digital banking (Marous, 2019). This huge amount of information has paved the way for the era of big data (Holmlund et al., 2020). The process of data has provided the banks with a 360 view on customers particularly with the insights related to customer behavior. Such insights open the door widely for the banks to further develop their customer-centric strategies engaging big data in delivering a more hyper- individualized services and create competitive advantage to escape stiff competitions facilitated by the digitization particularly that nowadays, the majority if not the totality of the businesses became customer-oriented placing the satisfaction of customers in the first place. Banks are also following this path, but banks are still behind due the existing of siloes and heavy regulations. The literature review showed that the big data have positive influence on the customer centricity in the banking industry. Moreover, the negative influence of the big data on customer centricity can be minimalized by establishing a trustful relationship that demolishes the barriers and allow customer to provide private and sensitive information.

Big data provides new behavioral insights that can be used to push further the customer-centric approach and link it to sustainability phenomenon. The banking industry needs to grasp this opportunity to create a win-win situation. Banks also need to move from the traditional way of thinking when developing a product or service to adapt with the innovative big data thinking to gain customer loyalty. Banks need to invest in big data tools to be able to detect customer's behavior and propose a relevant personalized service or product. For instance, banks can analyze a specific customer behavior by analyzing his spending patterns, his financial means and dig further to his social life to provide him with a specific product that meets the needs of the client and prevents him from crossing his financial limits that can be harmful for him. For example, a customer under student loan, big data allows tracking his spending behaviors and detecting whether he is using his credit card to buy books and or scientific journal or spending the loan in night clubs or on stuff that are not related to the approved purpose. This behavior will be analyzed and customer will be added to the bank's watch list for customer of higher risk. If such behavior continues the bank may take action and request prepayment of the loan.

Another example, the case of a fresh graduate that was granted housing loan with a good track record, analyzing his spending patterns reveal that he is concentrating his purchases to improve his house, the bank may provide him with credit cards that offer him discounts at many home appliances and furniture stores of his choice.

Moreover, banks can use big data to detect client's mobility and provide him with the right products for example if customer that used to work near a branch has opened an account there. His company transferred him to another country and he bought a travel with his credit card; the bank should be proactive and propose on the customer a credit card or an account denominated in the currency of the country the customer is moving to. This is not the end; the bank needs to keep tracking the customer's movement proposing each time an appropriate solution that fits his new situation.

Thus client's experience journey will be enhanced and customer loyalty and retention are gained (Indriasari et al., 2019). Moreover, this customer can play a role in marketing the bank service either directly to his friends or through social media.

However, while focusing on big data to reach customer-centricity approach, banks should not only take into consideration the financial behavioral of its customers but also their social and environmental concerns. In this regards, Sheth et al. (2011) presented the notion of "customer-centric sustainability" which refers to the "impact of marketing actions on environmental, personal and economic wellbeing of customers". Therefore, banks should take into account the global raising concerns on environmental issues and work on developing strategies that not only target customers but also include long term perspective with social and environmental integration that reflects the sustainable development for all stakeholders to improve their reputation after repetitive financial crisis (Pardo-Jaramillo, 2020). Strategies include participating in social and environmental events, developing and promoting innovative products and services that respect sustainability, facilitating the access of capital for the institutions that respect social and environmental sustainability. For instance, banks can introduce sustainable project finance for their client to improve awareness and promote green loans such as solar panels, smart fuel consumption buildings that target a niche of its clientele based on the analytics of big data generated in the market where the bank operates, Furthermore, develop degradable credit cards or that downloaded application in mobiles phones instead of using plastic cards.

## **3.2 Intertwining Big Data, Customer- Centricity and Sustainability in Lebanese Banks**

### **3.2.1 Conceptual framework**

Given that Lebanon enjoy economic and personal freedom, large amount of data are released from the use of multiple channels such as social media, banking channels such as mobile banking, ATMs, online banking and many other channels. Consequently, Lebanese banks should be agile in leveraging on big data to timely provide customized experience and journey to their clients to be able to amend mind-sets towards customer experience management that ensure customer long-term loyalty and as such provide banks with sustainable sources of competitive differentiation. However, while concentrating on

customer-centricity Lebanese bank should also integrate social and environmental activities into their operations given the growing environmental concerns from the people-potential client of the banks.

For instance, banks should be agile in putting strategies leveraged on big data that comprise both customer centricity and sustainability. Strategies such as modernizing banking infrastructure to benefit from technology capable of providing useful data and customized services, customer lifetime value, redesigning the role of branches (i.e. changing the habits, beliefs and experience of the personnel), digital security layering, shifting towards green banking by implementing tough rules in this subject and supporting environmental conscience companies by supplying cheaper capital.

Well-developed strategies are crucial to overcome the negative impact of big data on customer centricity in banking industry particularly regarding (1) the collection of quality and accurate data otherwise the customer experience and journey will be hurt (2) filling the gap of legal and regulatory delays on the use of data and (3) sensitive information protection. As such, the following conceptual framework is built

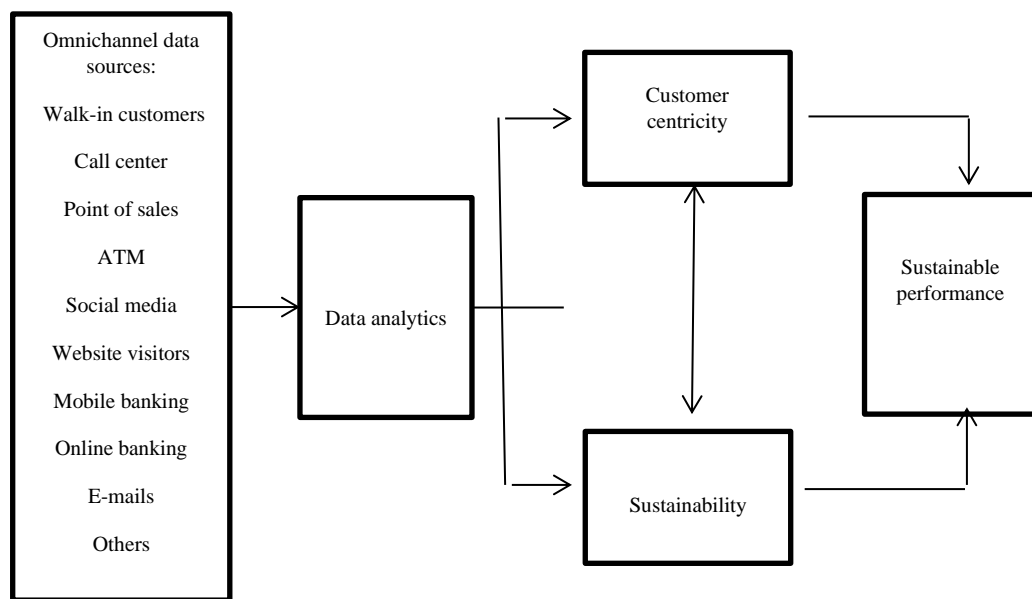


Fig.2: Conceptual framework for intertwining big data, customer centricity and sustainability for Lebanese banks

### 3.2.2 Customer-centricity and sustainability for lebanese banks

Banks in Lebanon are the main financial intermediaries that have large contribution in financing the economy.

During the last decades many banks in Lebanon started to acknowledge the importance of sustainable development and introduced many sustainable practices in their operating activities through constructing green headquarters which are energy efficient, and promoted awareness among employees on paper, water and electricity consumption behaviors, sponsoring social and cultural events, encouraging environmental activities and providing subsidized green loans mainly loans for the installation of solar panels.

At the same time, these banks particularly the Alpha group banks have been heavily investing in new technology that is more flexible than the existing core system and allows breaking the banking siloes through the consolidation of all operations executed by the same client in one system that facilitate the capture of client's needs and preferences. Such steps enable banks in Lebanon to move from product to customer centric by leveraging on the large amount of data generated from customers' different spending behaviors detected by the usage of banks channels and other channels such as social media.

However, the usage of big data to mutually integrate between customer-centricity and sustainability is not yet realized by Lebanese banks. Therefore, it is necessary for Lebanese banks to intertwine customer-centric with sustainability to achieve competitive differentiation needed for sustainable performance and growth.

#### 4. CONCLUSION

Nowadays, life is tech-savvy generating huge amounts of big data. Big data analytics helps the banking industry in capturing customer behaviors, spending and consumptions patterns. In parallel, today digitization rendered customer expectations and satisfaction higher and more complex. Banks like other businesses can benefit from big data to deliver a one step further in the personalization of products and services or what is called the “segment of one” to enhance customer experience journey and achieve customer experience management. In this study, big data is presented not just in terms of huge size but as a means to produce knowledge or useful information. Conclusively, the information extracted from different channels can help in the personalization of services and products taking into account customer social and environmental concerns as such enhancing customer experience and journey in the banking industry which will be reflected in improved sustainable performance.

Big data, however, have some vulnerabilities and challenges: huge amounts of data about a particular customer present important privacy and security issues. Big Data need hence, to be secured in the cyber space. Cyber security has become a prime concern for any organization to prevent and deal with data security threats and to protect their customers' privacy. In the future, the Cyber security aspects of big data related to the banking industry can be subject of detailed research being key challenge faced by banks.

According to the developed framework, Lebanese banks should be agile in using big data analytics generated from multiple channels (not only the bank's channel but also social media channels) to develop not only personalized products and services but also built these products and services around customers growing engagement on sustainability. Such steps became vital to survive severe competition and remain profitable particularly with the step in of fintech companies to banking products.

Additionally, as the Lebanese banks model was framed intertwining big data, customer centricity and sustainability based on literature review future studies may statistically test and validate this framework to improve its acceptance. Empirical studies may add or omit one or more variables to assess the effect of developing sustainable customized services that take into consideration clients' social and environmental concerns based on analytics of the big data gathered from different and multiple channels to reach customer experience management which provides banks with competitive advantages and consequently ensure sustainable long term financial performance.

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