BANK SETA

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DATA MANAGEMENT IS KEY TO BANKS' SUCCESS

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1. INTRODUCTION

We live in a world increasingly driven by data. In fact, business in the 21st century is being redefined by a data-driven revolution. It has been proven that clients are no longer just transacting, what they are actually looking for is a delightful experience and therefore banks need data to drive more personalised customer experiences which benefit customers and businesses alike.

Banks that get data management right will be better positioned to make strategic business decisions based on solid data they can trust. (PWC, 2015) How Banks define their data strategy and approach including its choice of big data and cloud technologies will make a critical difference in their ability to compete in the future.

Headlines such as "The world's most valuable resource is no longer oil, but data" or "Why data may be more valuable than dollars" are common. One blogger by the name of David goes on to say "data is the new oil. We need to find it, extract it, refine it, share it and monetise it." He further asks the question; What is the real economic value of data? It is therefore for these reasons that the underlying power of data comes as no surprise, hence data management is key to business success. Success in this context means enhanced customer experience. A universal truth in business is that all roads lead to data. In an increasingly complex and connected world, the ability of an organization to collect, manage and analyse data effectively separates the winners from the runners-up. (Greengard, 2016).

Good data management[1] includes developing effective processes for consistently collecting, recording, storing data securely, backing up and modifying data so it can be transferred between different types of software for analysis. Benefits to the Banks of having a strong data management foundation include improved operational risk mitigation, better decision-making capabilities and improved efficiencies which will eventually lead to client satisfaction. Data has become the core strategic asset in most organisations and data management has become a top priority for most C-suite leaders. The structured and unstructured information companies collect about people and processes has the power to spur cutting edge customer acquisition and retention strategies. (McKinsey & Company, 2016). Measures that require companies such as the major banks to report data on a mandatory basis, and make it available to authorised organizations and credit providers will enable consumers to seek out better deals based on their individual credit histories. ("It's time for a data revolution Anna Harper- Monday, 05 June 2017")

The financial services industry faces numerous data management challenges to become both customer-centric and meet regulatory requirements. However, many lenders continue to face the challenge of aggregating, managing and creating value from their data. (Mund, 2016). In a report done by Forbes Insights, it has been highlighted that banks are facing an increased demand for data from regulators. (Joch, Alan; Moreno, Kasia Wandycz, 2017). Most of the African banks still face this challenge and to respond to such data requests, it can be costly as at times new system capabilities have to be developed by banks. However, there are some regulators that are in the forefront spear-heading initiatives whose aim is to automate data collection from banks so that it is not a huge burden for banks to meet regulatory reporting standards. Bank of Mauritius is an example of such a regulator. It has started a data-centric project whose aim is to help banks to get rid of paper-based reporting, cut down manual resources who work on preparing reports and improve on management of quality data through validation checks which will be part of the system that is being developed.

Reading the report that was presented in July 2017 during a panel discussion at the second Africa Open Data Conference held in Accra, Ghana, it is clear that the whole African continent has woken up to the data revolution and that data is a political issue as much as it is a technical issue and therefore any challenges concerning data should be addressed at these levels. No doubt, Africa and African Banks are well positioned to reap the benefits of the data revolution for sustainable development, and to adopt 'leapfrog technology' that serves national and regional development priorities. The report further highlights another major challenge that not all the data produced in Africa is freely available.

Another challenge faced by Africa is that of Data storage which remains a challenge for governments and research

[1] *Data Management is defined as the development and execution of architectures, policies, practices and procedures in order to manage the information lifecycle needs of an enterprise in an effective manner.*

institutions," Wafula tells SciDev.Net, that the continent generates a lot of valuable data but does little to preserve and use it to support planning and innovations."

Donatien (Donatien Beguy August 20, 2016 Quartz Africa) noted that Data, and especially data of good quality, is essential for national governments and institutions to accurately plan, fund and evaluate development activities. African policy makers are increasingly called on to use evidence-based research to inform development decisions. But this requires the rigorous collection of data as well as a coordinated system to disseminate it. Basic development indicators are essential for an accurate picture of a country's development status. This includes a country's progress towards specific development goals and improving its citizens' socio-economic conditions. In fact, solutions to social and economic problems are often inseparable from the statistics. One cannot build schools without knowing how many children need to be enrolled. Private investors need to know what resources are available in a given country before putting in their money. A country needs to know what it grows and where to prevent famine. Donors can only know whether their aid is changing lives if they have data. In general, development programs entail measurable results. Development decisions should be informed by data. But more importantly this data must be turned into information that is easy to understand and useful to end users. You sometimes hear people say, "The data speak for themselves." But they don't.

Data is the first, crucial step. Then you need smart, objective analysis to make sense of the data and shape the narrative. Once the data supply side is up to par, the hope is that decision makers at all levels will increasingly demand relevant information to lay the foundation for policy making and budgeting.

Like everyone else, African governments and their development partners need good data on basic development metrics. To be of value, such data must be accurate, timely, disaggregated and widely available. This is not the case in many African countries. Basic development indicators are essential for an accurate picture of a country's development status. This includes a country's progress towards specific development goals and improving its citizens' socio-economic conditions. In fact, solutions to social and economic problems are often inseparable from the statistics.

Although far from finished, there's no doubt that Africa's data revolution has arrived. And although this revolution might not be televised, it will definitely be measured. A new generation of entrepreneurs across Africa, however, are forging a path through the data desert and aiming to make it green by collecting, analyzing and monetizing data.

African markets from Nigeria to Tanzania and Mali to Kenya are simultaneously rich and poor in data. Their economies remain highly informal and although billions of data points are created on the continent every day as billions of cash transactions are made, only a miniscule amount is recorded in any way. Without records that can be stored and mined in meaningful ways that would allow for lending and borrowing, African markets such as Lusaka City Market and Senegal market remain teeming pools of information that immediately disappears after transactions are made.
In informal cash-based systems, data from vendor sales is rarely translated into an accessible and manipulative format rendering it effectively useless. An example is that of a market place in Senegal Dakar, where we met a Micro-lender who records transactions in a black book and she is the only person with access to that book. This manner of recording needs improvements, as there are so many risks involved.

On the other hand, there are loads and loads of data that are generated through use of cell phones in Africa underpinned by a huge cell phone penetration. At the end of 2016, there were 420 million unique mobile subscribers in Sub-Saharan Africa, equivalent to a penetration rate of 43%. (The Mobile Economy; Sub-Saharan Africa, 2017) By the end of 2016, there were 172 million unique subscribers in West Africa, accounting for 320 million mobile connections. The sub-region's subscriber penetration rate now stands at 49%, slightly higher than the 47% penetration rate across the wider Sub-Saharan Africa region. (The Mobile Economy; West Africa, 2017) This huge penetration led to development of mobile money solutions in different African Countries as a way to improve financial inclusion for areas that had not been financially included. At the end of 2015, Africa accounted for 52% of the 271 live mobile money services in 93 countries and 64% of all active mobile money accounts. (The Mobile Economy; Africa, 2016)

With all the challenges mentioned on the previous paragraphs, the remainder of this paper looks at four elements that are crucial to succeed in data management and is structured as follows:

- Agility in Data management and Customer experience;
- One single version of the truth;
- Big data and enhanced customer experience;
- Technology as an enabler in Data management; and
- Conclusions / recommendations.

2. AGILE DATA[2] MANAGEMENT AND CUSTOMER EXPERIENCE

Getting the maximum benefit possible from data analysis means leveraging every possible external and internal data sources. Financial institutions have struggled with data management for decades. Traditional enterprise data warehouses have failed their remit to provide a 'single version of the truth' to power multiple business lines and departments. The traditional approach of warehousing data, and then expecting the business to self-serve (via vendor-supplied adaptors or custom queries) to meet the needs of each application that consumes data, has been proven ineffectual. Some problems include low agility, where data warehouses are notoriously slow, both to operate and to change. The rate of change across the industry is accelerating and a more agile approach will become mandatory for survival.

We cannot over emphasize the urgent need for Banks to focus more on developing products with customers in mind. There is a need to quickly acquire, process and analyse data to impact business decisions. This cannot be achieved with the old mind-set on data management. More agile data management techniques are required as traditional systems cannot address today's need for an adhoc, 'slice and dice" analysis. In this era of change, organisations need flexible analytic tools to quickly obtain the critical insights they need. Traditional rigid toolsets will not get the job done.

An agile data management platform provides immediate, flexible, granular data analysis for both tactical business actions and strategic planning decisions. Agile data management goes beyond traditional analytics tools to perform data integration, data quality management, enrichment and business analysis, such as correlating, filtering, sorting and statistical analysis. (Moving from traditional data analysis to agile data management).

Some of the challenges that are currently prevalent in data analytics (i.e. exploring external data, adjusting business logic, reconfiguring data sources and changing data feeds etc.) can be resolved by simplifying data acquisition process, allow rapid change, enable flexible analysis and facilitate a quick reconfiguration.

With agile data management techniques, the Banks can use data analytics to better size and prioritize opportunities. Financial institutions need a more agile and lightweight solution to their growing and changing data management needs, particularly in light of emerging complex regulations.
Data management is fundamentally about transit. We believe that successful data management is a logistics exercise and that is, the right data, at the right time, to the right quality, in the right shape.

Benefits of adopting Agile Data Management
There are many benefits that a bank can rip from adopting agile methodologies to execute its data management programmes.

1. Sprint Goal Success rate: successful sprint should have a working product feature that fulfils the sprint goals and meets scrum team's definition of done: developed, tested, integrated and documented.
2. Defects: Defects are part of any project. However, testing and fixing bugs can be time-consuming and costly. Agile approaches help development teams proactively minimize defects.

[2] *Agile Data Management is broadly defined as a collaborative approach in which cross-functional teams design and build minimally viable products ("MVP's") and features quickly, test them with customers and refine and enhance them in rapid iterations. Agile data similarly relies on a joint approach to development and delivery: cross functional teams comprising members of business and IT work in "data" labs that are focused on generating reliable insights that allow the company to address its highest business priorities and realize positive outcomes quickly. (McKinsey & Company: 2016)*

3. Total Project Duration: Agile projects get done quicker than traditional projects.
4. Time to Market: Agile Approaches help in minimizing the time it takes to provide value by releasing working products and features to users in an incremental manner.
5. Total Project Cost: Cost of agile projects is directly related to duration and since agile projects are faster than traditional projects, they can also cost less.
6. Return on investment: Agile Projects have the potential to generate income with the very first release and can increase revenue with each new release. (Layton, 2012)

Figure 1 is the snapshot from a survey carried out by VersionOne which lists survey results on benefits of adopting agile methodologies in different companies: (State of agile report, 2017)

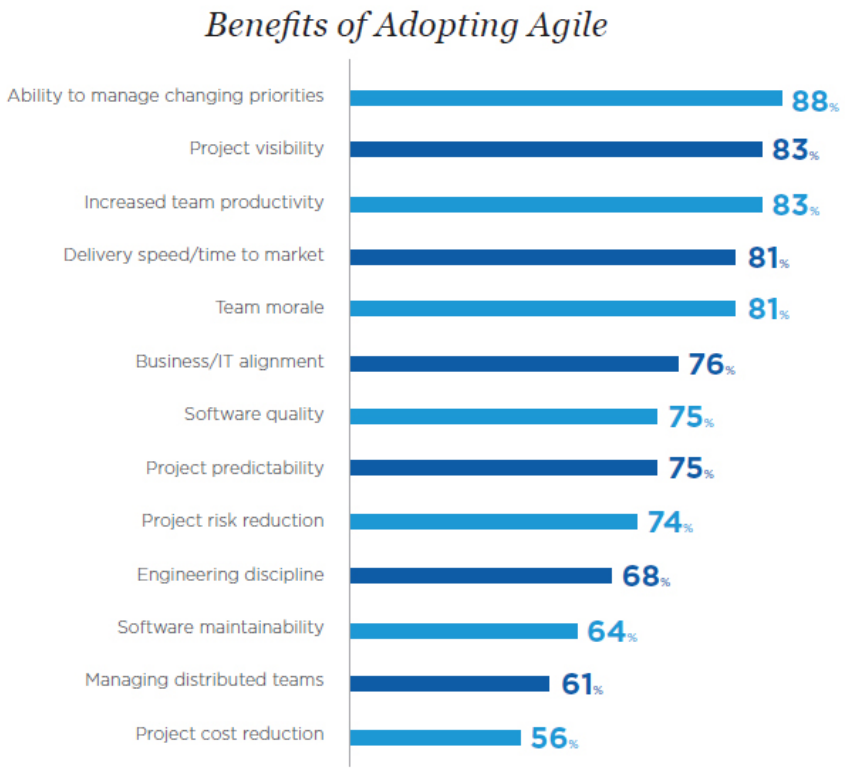


Figure 1-Version One 11th Annual state of agile report.

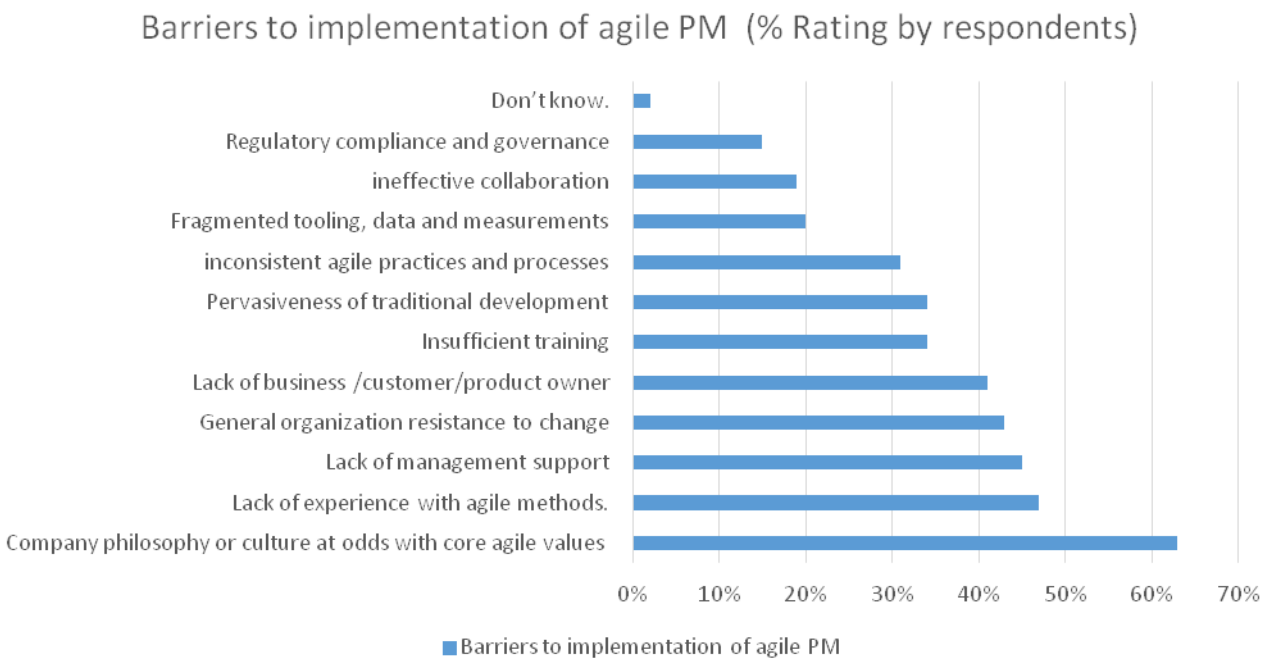
2.1 Success Story of a bank that has applied agile approach in its programs.

The ING Group is a true Tier 1 global financial institution with a strong European base and retail and commercial banking operations across the world. In early 2013, the ING in partnership with Infosys Finacle embarked on a massive exercise to transform its commercial operations in 28 Countries, spread across 3 continents. For Team Infosys Finacle, the ING commercial banking transformation program was the first full-fledged agile implementation to use a "fail fast, recover and leap forward" philosophy that enabled a fortnight sprint cycle for delivery. This was also the first project to extensively and successfully use the Proof of Usability (PoU) Model. By using PoU Model to tightly align requirements with capabilities, the team was able to significantly reduce the time, cost and effort of customization. Post-transformation, product managers will be empowered to take new and innovative products to market in a matter of days rather than months it used to take with the previous legacy systems. By harnessing development concepts like Proof of Usability and Agile, Team Infosys Finacle has been able to deliver the transformation in a time and cost effective way, while enabling the functionalities required for the ING Group to innovate and grow their commercial banking business. (ING Bank Simplifying Large Scale Transformations, 2017)

In an interview with Chief Information Officer of ING by McKinsey in Brussels, it has been discovered that ING's objectives in adopting Agile were to be quicker to market, increase employee engagement, reduce impediments and handovers, and, most important, improve client experience. ING is progressing well on each of these. In addition, it is doing software releases on a two- to three-week basis rather than five to six times a year, and its customer-satisfaction and employee-engagement scores are up multiple points. It is also working with INSEAD, the international business school, to measure some of these metrics as a neutral outsider. (Mahadevan, Jacobs, & Bart, 2016).

2.2 Barriers of adopting agile methodologies within organizations.

There are barriers of adopting agile methodologies in different organizations. In the survey conducted by version one, most of the organization leaders and c-suite executives flagged the following points as barriers of implementing agile methodologies:



From the ratings it is clear that company philosophy and culture plays a huge role when it comes to adoption of agile methodologies. The graph also speaks to people aspects like lack of management support and lack of business or customer or product owner. It further depicts that organization's change management practices are crucial to successful adoption of agile methodology. Cottmeyer (Cottmeyer, 2017) in his report he highlights 12 key barriers to agile transformation and such resonates with the feedback from Version One survey and top 5 barriers are as follows:

1. Requires structural changes.
2. Requires role changes.
3. Requires cultural shift.
4. Requires governance changes.
5. Human resource politics.

It is of utmost importance that an organization that is in the process of adopting agile methodologies towards data management pay a special attention to the above mentioned barriers and has a clear plan and strategies on how such are going to be managed.

2.3 Feedback from Interviews on Agile

Four leaders from a South African bank were interviewed. The overall feedback from both organizations is that agile data management is of great importance to ensure success of data management projects and improve on benefits realization post implementation of such projects. Both organizations are slowly adopting agile methodologies but such methodologies have not yet reached maturity as such involve a lot of changes in new practices, process and organization's governance. Furthermore, Head of Data management from another South African Bank had this to say on agile data management: "Waterfall; we all understand is the normal project plan phases (i.e. start here, build a business case, get it approved, get the finances and then I set up a project plan and governance etc. The agile bit says, I want to show minimum viable product ('MVP') and then I will start building from that incrementally. Now from a data management perspective, what that means is that I've got dark data, but in order for me to make a solution that works, I need to give you little incentives for you to be able to give me more data, so that I can then have a full view of "YOU" as an individual so that I can then serve you better."

Clearly, banks should rethink an approach and practices to take when it comes to delivery of new products and services. We strongly believe that adopting Agile Methodologies is a way to go as the benefits are evident from companies that have adopted Agile. Data Management Projects and Programmes should also be delivered using Agile methodologies so in order for banks to quickly observe envisioned business value. However, a clear plan on how change management is going to be handled if an organization is in the journey of adopting Agile in its data Management Projects has to be crafted. Furthermore, a special attention to the above mentioned barriers, a clear plan and strategies on how such are going to be managed are of great importance in ensuring smooth adoption of agile approach when it comes to data management.

3. ONE SINGLE VERSION OF THE TRUTH

We have different systems for different product offerings and these systems are not interlinked at all and this may result in duplicate client profile. Single version of the truth is important in the sense that all the decisions you want to make, whether is agile data management, big data, technology, single version of the truth binds it all together. More than ever, the ability to manage torrents is critical to a company's success. The world has more data than ever before. A cross-industry studies show that on average, less than half of an organisation's structured data. In fact, it is estimated that by 2020, we'll produce 44 zettabytes every day. That's equal to 44 trillion gigabytes. One gigabyte can hold contents of enough books to cover a 30-foot-long shelf. Multiply that by 44 trillion. That's a lot of data, too much for most companies to process. And yet front-line employees are still often left operating with data that's "too little, too late". Most organisations are challenged to extract meaningful insights from their customer data when they are drowning in so many data feeds. Data is not always shared efficiently. Many Banks operate in silos, for example the customers' service and sales departments do not share a customer relationship management database and employees don't often collaborate around the customer to ensure powerful customer experience. It is therefore no surprise that you can have an employee from vehicle asset finance asking the same type of information that already exists in the home-loans database. The problem is that an

employee in one department does not know or even use the data that spans the organisation. This often results in wildly inconsistent customer experiences that make Banks look disconnected and unfocussed. The fact of the matter is that the client should never be asked to reproduce data that already exists in the organisation's database. Validity, reliability, completeness, precision, integrity, availability and timeliness of data are all essential aspects of data quality. When companies lack one single version of the truth, teams across the organisation may create and store data they need in siloed repositories that vary in depth, breadth and formatting. Their data management is often done is isolation and with inconsistent requirements. The process is insufficient and expensive.

In our trip to Mauritius, we met with a newly appointed marketing manager of a pharmaceutical company who had just been appointed to support South Africa and other Southern Countries. In our conversation, her main reason for her trip was that since she was new in her role, she was looking for market-related data on how their products were performing in the market so that she could use it for decision making and crafting of marketing strategies. That kind of data was available in South Africa but it was not available in all the other Southern Africa Countries and she had to travel to such countries to try and gather that data. This is a data problem, if the company had systems in place where this data could be mined, there would be no need to travel to different countries and this would save costs for this company. Banks are not an exception when it comes to this problem. Our observation is that there is a problem of connection between different subsidiaries' systems for most banks. A typical example is when a client travels to another country and request services from their bank in that foreign country, they do not get services the way they would get in such in their own countries. The effect of this is bad client experience. However, when we were in Senegal, we discovered that there is a bank that has been able to overcome this challenge. The bank is present in a number of Western African Countries, when a client travels to one of those countries where it is present, they are helped seamlessly due to the fact that the banks' systems are integrated as each one of those subsidiaries is able to pull or view client's profile. In our conversation with its employees and CEO to understand how they are able to pull this off, we discovered that they have a full-fledged Business Intelligence Unit within the organization which has led their data-centric projects or investments which solve or answer core challenges that the organizations have.

To excel in data management requires what is called 'one version of the truth' to ensure enterprise transparency, auditability and executive oversight of risk. All business functions need one data source they can trust. With today's growing use of dashboards and the focus on managing though key metrics, having one version of the truth is becoming even more important (Mund, 2016) Banks struggle to manage data because they possess many disconnected legacy systems. This results in duplication of data across multiple systems and this can cause data inconsistencies if reconciliation is not done continuously. If data quality is not up to standard, this means for reporting purposes to the regulator and other stakeholders, like Board, a bank has to spend a lot of time working on cleaning the data and this will lead to increased costs and missing of deadlines. To remedy this kind of situation, PWC has done a study on how banks can improve data management. (Devil in the data. how banks can improve data management) They suggest that banks should improve in the following four components.

a) Data Ownership and Stewardship

- **i.** Empower the Chief Data Officer (CDO) with full support from Top management;
- **ii.** Create data governance council;
- **iii.** Align risk and finance teams; and
- **iv.** Oversee the execution of data policies and procedures.

b) Data Architecture

- **i.** Define, consolidate and standardize the blueprint for data sourcing to a single point of truth across the risk and finance functions;
- **ii.** Standardize definitions and classifications of products, customers and other deliverables; and
- **iii.** Reduce data replication.

c) Metadata management

- **i.** Develop Standards and systems to manage the source, quality, consistency, usability, security and availability of data;
- **ii.** Define a consistent business information model; and
- **iii.** Define standards to continually refine data attributes and better manage how data is sourced, collected and stored.

d) Data Delivery

- **i.** Assess reporting needs across the risk and finance functions;
- **ii.** Partner with business to refine reports; and
- **iii.** Partner with IT to take advantage of leading technologies.

In a survey conducted by McKinsey in 2016 (The need to lead in data and anlytics), it is evident that Senior-leader involvement and organizational structure plays a critical role in how effective (or not) a company's analytics efforts are. Many respondents in the survey (The need to lead in data and anlytics) say the primary responsibility for data and analytics agenda lies with the CEO. It can therefore be concluded from this survey that data management governance should be the CEO's agenda or better be the key strategy area focus for the Banks.

4. BIG DATA[3] TO ACHIEVE ENHANCED CUSTOMER EXPERIENCE

We live in a time in which big data seems to be the ultimate solution for data collection. The possibility of obtaining massive and segmented information through the internet, the fact of being permanently geo-localised through our smartphones or the huge amount of metadata we produce in our virtual chores (i.e. getting to popularise the saying "Google knows you Better than yourself"), have been the real revolution in every conceivable sector.

Because of big data, managers can measure and hence know radically more about their businesses and directly translate that knowledge into improved decision making and performance. As an example, consider retailing. Booksellers in physical stores could always track which books sold and which did not. Once shopping moved online though, the understanding of customers increased dramatically. Online retailers could track not only what customers bought, but also what else they looked at; how they navigated through the site; how much they were influenced by promotions, reviews and page layouts; and similarities across individuals and groups. Before long they developed algorithms to predict what books individual customers would like to read next. Traditional retailers simply could not access this kind of information, let alone act on it on timely manner. It's no wonder that Amazon has put so many brick and mortar bookstores out of business.

Therefore, there are opportunities to leverage big data in creating value for clients, in that operations can be improved and management be able to make better and more intelligent decisions. When big data has been captured, formatted, manipulated, stored and analysed can help a company to gain useful insights to increase revenues, get or retain customers and improve operations.

Big data, like analytics, seeks to glean intelligence from data and translate that into business advantage. Data driven decisions are better decisions. Using big data enables managers to decide on the basis of evidence rather than intuition. For that reason, it has the potential to revolutionise management.

Big data can be used to answer questions such as:

- Who buys what, when and at what price; and
- Can we link what consumers hear, read, and view to what they buy and consume?

And can actually help predict what would be the customer's next transaction, using predictive analysis.

To build a lasting advantage, to leverage on big data, Banks need to turn to more strategic questions about longer term customer stickiness, loyalty and relationships. The questions that need to be asked of big data are not just what will trigger the next purchase or transaction, rather, what will enhance customer experience and have the same customer remain loyal, not just at what cost will the funding be provided to a customer but focus on customer's life time value. Simply put, rather than asking how we can use data to better target customers, we need to ask how big data creates value for customers and that

[3] *Big data is defined is an evolving term that describes any voluminous amount of structured, semi-structured and unstructured data that has a potential to be mined for information. C2B – Consumer to Business*

is a shift from asking what big data can do for us as an organization to what it can do for our clients.

Professor Niraj Dawar suggests that every company **(Banks included)** should ask three questions to examine how its big data can create customer value: *(Review_Havard_Business, 2016)*

- What types of information will help my customers reduce their costs or risks?
- What type of information is currently widely dispersed, but would yield new insight if aggregated? and
- Is there diversity and variance among my customers such that they will benefit from aggregating others' data with theirs?

From the practical perspective of applied managerial economics, revenue growth and productivity improvement can only be achieved through more effective business processes, including better performance management processes. (Williams, 2016) In an era where better information and analyses have become factors of production and competitive differentiators, BI is the right tool at the right time. This calls for banks to create Business intelligence and Big Data Analytics Strategy.

Maxwell Wessel posits that it is not about big or small data but it is about the right data. He cites Uber success story in that Uber focused on the right data which enabled them to effectively and efficiently dispatch cars to its clients. He suggests that Leaders should ask the following questions so in order for them to drive rip benefits from data: (Wessel, 2016)

- What decisions drive waste in your business?
- Which decisions could you automate to reduce waste?
- What data would you need to do so?

The real objective of Big Data Analytics is actually to seek for business intelligence (BI). It enables decision makers to make the right decisions based on predictions through the analysis of available data. Therefore, we need to clarify new attributes of Big Data and establish their relationship meaning across three aspects (or domain knowledge), namely:

- Data domain (gain hindsight i.e., metadata patterns emerging from historical data)
- Business intelligence domain (making predictions: insight i.e., deep understanding of issues or problems), and
- Statistical domain (making assumptions: foresight (i.e. accurate prediction in near future) (Big Data Technologies and applications)

When one searches the literature in famous journals, most use cases of big data are from America, Europe and Asia continents. As we travelled to different African countries, we discovered there are different organizations that already utilizing big data strategically to derive value out of it. Below are such examples from Senegal, South Africa, and Lesotho.

Wari in Senegal is an example of how the company actually utilized big data to come up with products that are tailor made for the customers. Wari gathered and analyzed the behavior of certain women in a particular village and how these women will combine monies, lend to each other and go buy fish and sell in the market place. The company then came up with a product, where instead of lending to one family member, money can now be lent to more than one family member and create more value for the clients. Effectively this is a company that strategizes using data and has plans to monetize data going forward.

A case study was conducted on Nedbank on Big data to enhance customer relationships and below is a summary of the study. Nedbank's continuous strive to deliver new and innovative technology to its clients was recognised at the global Efma Accenture Innovation Awards ceremony held in Amsterdam on 28 October 2015, as the bank clinched the Big Data and Analytics award for its first-in-market data analytics tool, Nedbank Market Edge™. (Nedbank's wins big at global innovation awards with SME tool, 2015) Nedbank also claims that Market Edge was the first "big data" commercial offering by a South African bank. Nedbank markets Market Edge as a data analytics tool that records customers' shopping behavior and offers behavioral insights mined through Big Data on a web-based platform. Merchants are provided with range of vital information such as a breakdown of clients' spend patterns, income segmentation, gender and age demographics to enable companies to analyse key trends as well as changes in their client's behaviour over time, making it easy to develop real-time responses. (Winig, 2016).

A manager was interviewed from one of the South African Banks. He suggested that in the forex business, big data and machine learning techniques can be used to

help clients get better prices in the forex market, just as another example. He further added that using data science capability, the Bank has built a lead generator that takes hundreds from social media sources which enables the relationship managers to get real time views/ news from clients.

An interview with Makeba's CEO was conducted and the output of that interview follows. Makeba is a start-up company which has presence in Senegal and other few African countries. Its main focus area is electronic money transfer. In our interview with its CEO, we gathered that data is the core competency for their company. They are building a powerful scoring engine which will gather data when users transfer and spend money. The scoring engine will help in building a scoring score for both merchants and end users. He further emphasised that this is important for Africa as access to credit is very limited and expensive. This makes it difficult for small businesses to borrow money and grow their businesses. So the credit scoring engine will help in managing financial credibility of both the merchant and the end user. The aim is for Makeba to be able to extend loans and lines of credit to clients at low rates and this is going to be feasible through accumulation of big data and building of profiles for clients. Big data is also going to be used for prediction purposes. It is going to help the company to plan in advance for their merchants to manage liquidity. For example, when a holiday is approaching, big data analysis and prediction is going to help in determining how much merchants need so that they do not run out cash. Furthermore, Makeba is going to use big data to prevent money laundering. They have developed an AML Module which uses big data. When a client signs up to use Makeba services, a profile is created and a user tells the merchant the amount of money he or she will be transferring or receiving per month. The module is going to be able to match clients profile with the usage and it will keep on updating such a profile and when the money being transferred or received is above a certain threshold, then questions are going to be asked so as to prevent money laundering. This module uses big data and it has detections mechanisms for detect money laundering red flags so that such can be handled quickly and due processes can be followed as prescribed by different anti-laundering standards and legislations. The CEO pointed out that one of the challenges that Africa is faced with is access to big data, underpinned by the fact that Internet connection has not fully penetrated most of the African countries. He further mentioned that the other challenge is the slow revolution of regulations in different countries and this makes it difficult to do business and help the under-served populations.

Vodacom Lesotho was closely studied outputs of such study are as follows. Vodacom Lesotho has published in the newspapers its new Brand Positioning Strategy. This is strategy is to be implemented in 36 countries where Vodafone brand is present. Their new brand positioning reflects a fundamental shift in the way Vodacom does and will do business. It also aligns with their 2020 vision and strategy of becoming a leading digital company. They aim to be the customer champion when it comes to customer experience using big data and Internet of things (IoT) to better connect and service them. In my interview with an employee of Vodacom Lesotho, he emphasised that big data and Internet of Things (IoT) is the main focus area. Vodacom has recently opened IoT Lab in Johannesburg which provides a controlled test environment and framework for customers and developers to develop hardware and applications as well as test their end point devices on the NB-IoT network. Most of the use cases of big data and Iot have been tested and deployed in South Africa. Vocacom Lesotho is in the process of doing feasibility studies on how best they can use big data to solve customer problems. There is collaboration with different departments to come up with use cases but there is one main focus of trying to build a robust subscriber profile which will gather data from different sources like social media, spending patterns from Mpesa, etc. and this is going to help Vodacom to come up with targeted offers to its subscribers. This is a key to other services that could be offered to Subscribers.

Below are other examples on how banks can use big data to improve customer experience:

4.1 SENTIMENTS ANALYTICS

Social media has opened a new avenues and opportunities for banks to connect with their customers, but sheer volume of communications about brands, products and services, discussed, shared, criticised or liked on different social platforms can be overwhelming. Sentiments analytics helps to rapidly read all this data, providing an executive summary of what people like and don't like about the company brand or its products. The reasons behind sentiment can be easily extracted, providing valuable business insights. Sentiments analytics is simply the study of customer's sentiments toward any object of interest.

This will include:

- Monitoring what customers say; (An Example is that of Nedbank that realised the great advantages by using

social media analytics. Analysing various social media platforms in almost real time provides Nedbank's marketing department information about the marketing campaign, customer preferences and complaints. An easy source of customer sentiments is from the social sphere, including social networks, blogs and review sites. This data is naturally unstructured and dynamic as new text is generated simultaneously. This data is then suited to measuring sentiment over time such as before and after an organisations branding efforts. Internal data gathered from past consumer surveys and call logs may also provide good source to measure the customer sentiment toward particular product

- Identify key customers; internal customer profile may reveal which customers or clients give a high number of referrals. This database may also contain the attributes that can be used to determine if the customer is influential, such as demographic information. Link analysis strongly depends on highly unstructured social network data and data from third party blogs and review sites; if highly influential customers are already known, such as those that have been flagged for a high number of referrals then decision trees can be used to determine the most important attributes of an influential customer; and
- Examine customer feedback to improve products and services: Nearly all sources of customer sentiment will be available in a text based format either from social media networks or comments written by staff in call centres. (An example is that of Barclays wo was able to derive actionable insights from real time social media analytics after they launched their new banking app. Initially the app did not allow young consumers under the age of 18 to transfer or receive money. This created negative comments from teenagers as well as from their parents as they could not transfer money to their kids. After the data revealed this problem, Barclays improved their app promptly, adding access for 16 and 17 year olds.

4.2 CUSTOMER 360

Understanding customer as a whole is important to stay ahead of competitors. The customer's transactions and travel habits are also important to build a lifestyle and discover new insights.

This will include:

- Identify the customer profile;
- Understanding the product engagement of the customer; to accurately assign a product lifecycle stage to a customer, profile data and transaction data is needed to determine how they use the products. Metrics such as customer engagement ca be gained from this data. Recent clickstream URL referrals and cookie data gives information if the customer is in the research stage of the product cycle. and
- Detect when the customer is about to leave. Customer profile and transaction data can be used to analyze how the customer is using the product which in turn can be used as behavioral indicators of potential churn.

4.3 CUSTOMER SEGMENTATION

Using big data and machine learning can help banks to perform deeper and broader segmentation of its client-base. This segmentation can help banks to design targeted marketing programs, create loyalty programs based on card usage habits, optimize pricing strategy; and Build relationships with valuable customers.

4.4 NEXT BEST OFFER

By applying machine learning to big data can help banks with predictive analysis. Such an analysis will assist in enhancing loyalty through targeted offers, increasing product propensity; and product bundling to uplift revenue.

4.5 CHANNEL JOURNEY

Through analysis of channels usage by different client segments banks can be able to provide more relevant content in the preferred channel, recognize multi-channel behavior that leads to sales and Measure marketing effectiveness across channels. Banks can also harness information from their mobile apps. Some use location data from mobile devices to determine where to put new ATMs by identifying places customers frequent, says Khan, of A.T. Kearney.

Decision making. Banks are also using Big Data to make lending decisions, in addition to traditional measures such as credit reports. For example, loan officers can look at an applicant's spending behavior to see whether he or she splurges on vacations or buys high-end brands. That may suggest the person is prone to overspending, which can result in a higher interest rate, Newman says. "They're looking to offer you the highest interest rate you'll accept," he says.

Study conducted by Randy Bean, depicts that over 1000 executives reported that big data initiatives have helped their organizations to decrease expenses, find new innovation avenues, launch new products or services, add revenue, increase speed of current efforts, transform business for the future and establish a data-driven culture. (Randy, 2017) Benefits from those who have successfully unlocked potential that big data has are evident, however, Leandro Dallemule and Thomas H. Davenport ask a critical question: "what is your data strategy? (Dallemule & Davenport, 2017) They suggest a framework which looks at Offence and Defence as two ways of looking at data strategy. Data defense and offense are differentiated by distinct business objectives and the activities designed to address them. Data defense is about minimising downside risk and activities include ensuring compliance with regulations, using analytics to detect and limit fraud, and building systems to prevent theft. In summary data defense is about ensuring data security, privacy, integrity, quality, regulatory compliance and governance. Offensive activities tend to be most relevant for customer-focused business functions such as sales and marketing and are more often more real-time than is defensive work. It is about improving competitive position and profitability. Banks are heavily regulated and require strong data defense. But they operate in dynamic markets and typically devote equal attention to data offense.

5. TECHNOLOGY AS AN ENABLER IN DATA MANAGEMENT

Customer Experience is one of the top ingredients in winning and retail clients in banking industry. In an Africa banking Industry Survey conducted in 2016 (Africa Banking Industry, Retail Customer Satisfaction Survey), the key takeaways are that banks should improve the quality of interactions between employees and customers, increase the focus on delivering fast, accurate and timely transactions, rethink the mix of products and services to respond to shifting customer preferences, focus on satisfaction to drive recommendations and loyalty, encourage further adoption of alternative channels and deliver value for the fees and interest rates that are offered. These takeaways combined help to improve on the customer experience which is named the net effect of the emotions that the customer is left with after interacting with the bank.

Data are the cornerstone upon which companies are launching their digital transformations- investing in analytical capabilities, machine learning, robotics and other technologies to boost their odds of success (Using agile to accelerate your data transformation, 2016).

The financial services sector is going through dramatic change in today's highly connected digital environment. With heightened customer expectations, ever-increasing customer touchpoints, and the advent of new technologies, banking institution have been forced to enhance their digital capabilities to stay relevant, whether it be though front-end features such as mobile apps or self-servicing tools for customers and staff. (Pallas, 2016).

In today's digitized economy, the ability to use data represents a real and essential competitive advantage. To get to a future state of mature analytical competency, there's real work to be done in integrating the data you already have. This is a strategic goal for the entire company and when addressed properly, will lead you to develop experience and a data infrastructure that unlocks every next step. (Wilder-James, 2016).

The Banks should consider becoming the C2B[4] businesses, meeting customers' real needs and developing a portfolio of new GO digital businesses within the framework of what we call GAFA Banking Approach, and that is meeting customer engagements standards set by Google, Apple, Facebook and Amazon). To accomplish this, however Banks will need digital enablers that equip them to provide these new services effectively and efficiently.

It has always been argued that digitizing front end client interactions and processes can further improve client experience and reduce costs.

An excellent example of a company finding innovative ways to leverage existing, well established technology to simplify and streamline its processes for its customers is

[4] *C2B – Consumer to Business*

that of HSBC Bank. The clients and potential clients always had one complaint about Banks and that is on opening a new Bank Account. The amount of forms to sign and other paperwork to fill out is cumbersome. HSBC has managed to change this and become the first Bank in history that allows business customers to open a bank account with a selfie. Using a facial recognition software, the Bank can now use your selfie to verify your identity. No forms, ID or extraneous paperwork necessary. To make it work, a client simply downloads the HSBC app from the Bank's website, and take a selfie using their phone's camera. The image is uploaded onto the Bank's website, compared to an image of the ID photo that is uploaded t the system (i.e. driver's license, passport etc.) and that's it.

Data can provide huge insights for companies, but making the most of big data being generated is no longer possible without the help of machine learning. Machine learning offers one solution, if organizations can overcome their silos enough to implement it correctly. Each new customer action feeds back into the analytics engine, which helps inform the next best steps for a positive customer experience. For example, if a customer indicates through her online browsing habits that he/ she prefers an Android phone instead of an Iphone, she/ he will immediately start seeing an upgrade offer the next time she/he goes on Facebook. By leveraging automated analytics, customer interactions can fuel a continuous feedback loop that adapts real time to add value at every touch point.

Another example comes from the Royal Bank of Scotland ("RBS"). The Bank used to focus on aggressive sales goals- specifically, generating 200 000 new credit card customers per month. However, through a new culture and technology strategy, the company went through a transformation focusing on becoming a more trusted advisor to the customers than a typical bank would be. For example, analytics helped the bank identify customers that were in need of financial advice. Now when RBS sees a customer that is continuously overdrawing their bank account, the bank will flag that customer and give them a call to provide financial advice. This again is an example of using analytics with the objective of creating enhanced customer experience and the African Banks can leverage from this example and implement in their own environment. By using artificial intelligence to make sense of data pulled together from multiple sources (i.e. emails, social media, web behavior, contact center records etc.) organizations can derive enough insight to deduce the number of direct surveys they send out. Furthermore, applying deep learning techniques to this big data will also surface insights that you would never have thought to ask. If companies can balance the need to ask with the power to know, they can better engage customers in shorter, higher value interactions that deliver a much more rewarding customer experience.

Asian Banks have been able to unlock the potential that customer data has through use of advanced data management technologies to create actionable insights. (Four innovative ways to create actionable insights from customer data) They have been able to analyze customer composition to define and prioritize the relationship approach for different customers, based on the customer value to the bank. They have been able to identify and size untapped cross-product opportunities among particular type of customers, using bank and benchmark data. Furthermore, they have an approach they use to help front line with an up-to-date "propensity to buy model' which demonstrates the historical probability for the next-product purchases by existing customer type. Also, they are able to identify underused channels by product, to expand opportunities for cross-and up-selling.

In South Africa, Banks have been able to use data and biometrics to enhance client experience and lower identity theft. (Biometrics make life easier and safer for customers - A South African Case Study) Biometrics refers to the technology that is utilized to verify a person's identity through their biological attributes like fingerprints, voice print, retina and facial structure and DNA. One of the banks in South Africa named Capitec was the first to incorporate biometrics as part of the account opening process with finger print scanners and by taking webcam photographs of customers. Other banks still in South Africa followed suit, Absa / Barclays Africa is using Digital Wacom tablet to digitally store customer signature. Standard bank and Investec have also launched their biometric mobile banking solutions that utilize Apple's TouchID technology. The benefits that are ripped by the banks are improved security because it is hard to steal someone's identity when this technologies are used, cost effectiveness; banks will reduce paper consumption, improved ease of use; with biometrics in play, customers require less documentation to transact as customer identification and verification can be tedious with the traditional processes that banks use and lastly customer experience is enhanced as banks are able to identify and verify customers quicker with biometric systems when customers interact and transact with banks.

In as much as investment in customer experience is important, banks should be careful how they invest and measure the financial return on that investment. Banks should develop alternative scenarios on how the new experience for clients will be delivered, then consider the people, process and technology dimensions associated with each dimension and create prototypes to test the selected delivery scenarios against specific customer segments. (How much is customer experince worth;) Then, Banks should establish effective governance model to monitor and manage customer experience and report on client experience Journey Economics. From Mckinsey survey that was conducted across different organizations (The need to lead in data and anlytics) it is evident that most of the organizations say they invest in data management and analytics to build competitive advantage or improve customer experience, and High performers say their analytics activities had a greater impact on company revenue generation in the past three years.

Feeding inaccurate data into your data warehouse or mastering systems will not only make it difficult to obtain clear business insights and gather actionable information, it will also damage good data. Advanced organizations realize business professionals need to take ownership of the data they are helping to create and feed into IT systems. This prompted many companies to create data governance role to manage data quality from end -to -end. Successful data governance starts with solid, well defined data management strategy and relies upon the selection and implementation of a cutting edge data quality management solution.

From an interview conducted from one of South African Banks, a live example where data management can be linked to enhanced customer experience include:

Customer onboarding, KYC is very painful for big corporate clients, as most of them are multi banked, and therefore producing the same documentation every time the bank wants to KYC is painful for these entities.

The Bank has worked in partnership with Thompson Reuters to develop a KYC documentation utility where clients load their documents once and every bank that needs to KYC that client can go to T&R to extract the KYC documentation from T&R. That in itself is not data management but is enabled by data management. It means that the pieces of information required for KYC needs to be standardized and are clear.

From an interview conducted from one of South African Banks, he provided the following caution when it comes to technology as an enabler:

"With technology being an enabler the challenge is when we use technology to capture data from the word go we need to be clear on what standards to apply to that data. Technology is a key enabler when you already have clear ideas on what you want captured, what you need validated about that data and what are the non-negotiables about the data. There are normal business rules and exception rules. Technology needs to accommodate exception rules".

6. CONCLUSION

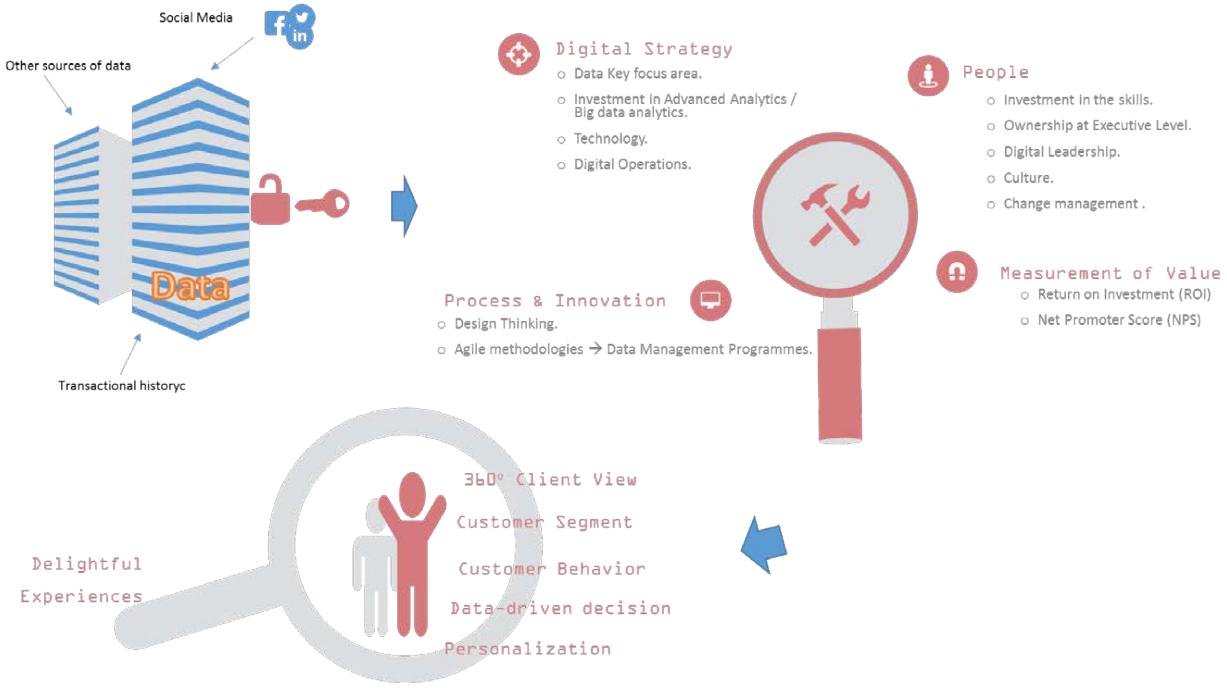


Figure 2 - Framework on using data as an enabler to achieve delightful client experiences

Figure 2 is the framework that we have developed which shows how an organization can unlock the potential that available internal and external data has. The framework has 4 major components namely Digital Strategy, People, Process and Innovation and Measurement of Value. We believe that as part of digital Strategy, banks should put data as a key focus area and invest in advanced analytics or big data analytics. However, we have gathered through literature and through Interviews we have done with different C-Suite executives that it is of utmost importance to define use cases or sources of value before one embarks on data and analytics project. Furthermore, investment in technology and transforming manual operations into digital operations is crucial as it would easy to gather data and quickly make decisions that impact the client.

Developing data management strategy and investing in world class dynamic solutions is not enough. Banks need to develop a compelling talent retention of the right people with right competencies when it comes to data management and unlocking business value that data has. It has been noted through research that there is high demand for data scientists and business translators, and it is projected that the demand is going to be higher than the supply. Furthermore, there is a need for digital leadership and ownership of data management programmes or projects at executive level. This is the key ingredient to successfully delivering on data-centric projects or programmes. Culture and way of doing things has to change as decision making process would no longer be based on past experience and gut feel but it would be based on insights that are gathered and mined from data. Under Process and innovation, banks have to adopt agile methodologies when landing data management programs as it is evident that such methodologies help in releasing products that meet client needs quickly and help in saving costs. With fail fast to succeed fast principle in agile banks can continuously improve on products that bring value to clients. We believe that blending design thinking and agile methodologies would bring ever better results as banks walks on the journey of being data-driven as both methodologies have a strong focus on putting the client at the center and focus on resolution of client pain-points.

In our interviews with different executives, one main comment is around how data management or big data can bring business value to banks. We therefore recommend that banks should put Return on investment measures at the beginning of the programmes and monitor such through implementation and post implementation of data management projects or programmes. Banks can measure value by using client experience metrics like Net Promoter Score (NPS) and Client Satisfaction Scores.

When all the four components of our framework are in place, banks will be in a position to have 360-degree view of the client using internal and external data. Banks will be able to do even deeper segmentation of clients which will lead to strong relationships and higher client's retention.

Furthermore, banks will be in a position to monitor client's behavior which can influence certain decisions and propensity to buy other products in a bank. Furthermore, when banks have more data on clients this can help with personalization of most of the services and this can also help in channeling marketing efforts instead of following blanket approach when it comes to marketing.

With believe that with adoption of the above mentioned framework, banks will be able invest in the right tools or platforms that will help making banks more client-centric and incorporate the voice of the customer in designing new products., improve on cross-selling current products and improving or optimizing current processes in order to deliver delightful customer experiences.

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