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A Guide to Gaining Advantage Through Data Warehousing

Cloud Foundations for Retail Banking

Introduction

> Banking is necessary. Banks are not.

Bill Gates

There's a revolution underway in retail banking and the stakes couldn't be higher. In the face of headwinds like greater regulation, the looming prospect of open banking, increased competition from fast and nimble fintech firms, and higher expectations from app-happy customers, the very definition of retail banking is in question. The services that banks provide are necessary, as Bill Gates so aptly pointed out all the way back in 1994, but who provides those services and how they are delivered is in a state of profound change.

In this environment, the cloud is both an external driver of change as well as a vehicle for leading and enabling transformation from within an organization. For financial institutions across the globe, the benefits of cloud adoption are undeniable. Such digital transformation brings with it a new agility, enabling a fresh acceleration of company strategies (Information Age). Cloud is clearly a key factor in the transformation; a recent survey from IDC found that financial services firms projected outlays of $20 billion on cloud services in 2019, putting the industry in the top three for IT spend in cloud.

Ultimately, the consumer will drive change and decide which firms prosper and which do not. The formula has clearly shifted as brick-and-mortar operations stumble and consumers demand a client experience that is intuitive, fast, and provides prudent suggestions for additional services. In the area of retail banking, incumbents clearly need to up their game. Ways in which banks have been compelled to raise the bar with analytics include:

- Predicting customer needs for specific financial products
- Ascertaining declining customer satisfaction and applying proactive customer retention mechanisms
- Determining a customer's desired channel of interaction
- Improving fraud detection methods
- Enhancing the performance of risk, pricing, and underwriting methods
- Streamlining customer service and issue resolution
- Maximizing customer acquisition by driving marketing effectiveness and sales conversion

While moderate progress can be achieved with an emphasis on existing analytical tools and streamlined interactions, exponential benefits are ultimately activated by machine learning (ML) and artificial intelligence (AI) as part of an advanced analytics program. For example, Contact Center AI can simultaneously improve customer experience and raise operational efficiency by combining the best of Google AI with existing contact center software. As a result, it is possible to deliver a more intuitive and personalized experience by applying natural language understanding, speech capabilities and search in ways that support customer service agents in real-time.

In all cases, a solid cloud and transformational foundation that includes everything from technology to development practices must be established first, and one key component of this effort is effective data management. Data is the fuel that gives life to the modern enterprise, and having a data warehouse to run fast and flexible queries that generate accelerated insights is a key to building the foundation for success. Results have shown that organizations can gain real dollar savings along with increased insight and improved performance with Google Cloud's modern data warehouse, BigQuery. Research findings show that organizations can expect to lower their three-year TCO up to 52% by migrating from their legacy on-premise and cloud data warehouses to BigQuery.[1]

[1] https://services.google.com/fh/files/events/esg_economic_validation_migrating_to_google_bigquery.pdf

Data Warehousing as a Foundational Business Decision

> Data, data everywhere and not a thought to think

John Allen Paulos, Professor of Mathematics, Temple University

The business world has seen an explosive growth in data, but traditional data warehouses are melting under performance constraints as they struggle to keep up with these rapidly growing data volumes. Traditional data warehouses were designed for an era of batch data ingestion and basic business reporting. Today's analytics demands have vastly evolved and businesses need real-time, predictive insights from both streaming and batch data to make data-driven decisions at speed and scale. Only a modern, cloud data warehouse can address these new analytics requirements and deliver accelerated insights. Consider the following business drivers in retail banking that a modern data warehouse helps address.

Cost:
The original impetus for the proliferation of cloud resources was cost reduction, and that remains true today. The move from fixed assets to variable resources is a shift from capex to opex that doesn't hinder a company but, in fact, more accurately represents the operating profile of the enterprise. In fact, IDC Financial Insights recently estimated that the banking industry would spend $20 billion on cloud in 2019[2] and earlier reported that the biggest global banks are saving $15 billion from cloud adoption, cutting technology infrastructure costs by 25%.[3] Traditional models that emphasize rigid development protocols and high cap-ex for infrastructure simply can't cost-effectively do the job while public cloud resources have flexibility in their base DNA.

Scalability:
A major drawback to fixed, on-premise compute resources is just that: they are fixed and unable to meet the variable demands of a business. Public cloud resources, on the other hand, are variable by definition and can be easily spun up or spun down as demand warrants. The modern enterprise needs to be able to elastically grow and shrink compute resources based on the type workload and analysis required.

Google Cloud Platform offers scale insurance so you can start at any size and scale up or down cost effectively, as needed. Importantly, scalability is a two-way street: aside from the obvious capacity to expand in order to meet the demands of success, scalability also offers the opportunity to quickly and efficiently provision resources to test new ideas as well as wind down those experiments and other under-performing activities. Simply put, resources can be deployed much more efficiently using GCP.

Flexibility:
Flexibility goes hand-in-hand with scalability. Financial institutions do not have the luxury of Silicon Valley start-ups that can "move fast and break things" but in order to meet shifting demands from consumers and the new product offerings from fintech competitors they do need to embrace the "move fast" aspect of that dictum as much as possible.

[2] https://www.idc.com/getdoc.jsp?containerId=prUS44891519

[3] https://www.reuters.com/article/us-usa-finance-cloud-analysis/u-s-financial-firms-embrace-cloud-fat-fingers-notwithstanding-idUSKBN16O0FO

Speed:

Speed cannot be overemphasized because it enables a radical liberation of employee resources and brings the ability to innovate at a rapid clip. Potential new solutions can be spun up, tested and wound down if they are unproductive or immediately expanded if they have benefits. This allows an enterprise to innovate at the speed of the internet, which is not possible when data is scattered across multiple platforms in silos.

Simplicity:

The implementation of a cloud-based solution affords the opportunity to eliminate the unwanted complexity of traditional, constrained data solutions and the consequences that go with it. When data warehousing is part of a seamlessly integrated platform, you can ingest streaming and batch data with ease and rapidly share reports and datasets in a matter of clicks. A modern data warehouse also provides the ability to access data from hundreds of business apps and Business Intelligence Applications in a central location.

Security:

Contrary to popular opinion, a move to the cloud doesn't necessarily come with a sacrifice of data security. In fact, just the opposite is true. The embedded security posture of public cloud employs a suite of software-defined automation that offers advanced identity access management, data classification, encryption, perimeter defense, surveillance, patching, containment, and response. Google employs the most rigorous global security and privacy standards in order to help you protect all of your sensitive data, e.g. customer PII data and payment card information.

On the other hand, those who deploy traditional security postures knock themselves out in herculean, process-heavy efforts to protect proprietary and sensitive data, often with disastrous results. In a recent survey of banks, only 21% of respondents said that their security strategy/implementation is optimal[4]: cloud can help to show a better way forward.

Looking at security from a different perspective, access restrictions on data prevent teams from collaborating working effectively within traditional data warehouses security postures create silos. BigQuery removes these limitations with secure, rapid data-sharing you can users can rapidly rationalize sharing with a few clicks so that the right people have access to the right data at the right time.

The Pros and Cons of a Cloud Data Warehouse Migration

Too often, surveys of new technology place an overemphasis on the possible gains and too little time on the hard work that must be done in order to win and maintain the promised advancements. The truth is, transformation is hard work and the risks arising from poor implementation are all too real. It pays to go into a data warehouse migration with both eyes open and a transformation plan that firmly addresses risks and success criteria.

Looking at the "pros," here are some of the expected benefits:

Time to Value:

Without a doubt, the presence of a cloud-based data warehouse leads to a big increase in the velocity of change within an organization. Business leaders are now able to access the tools they need to build and deploy new solutions rather than fight over scarce, on-premise resources. BigQuery enables businesses to accelerate time-to-value with a serverless, self-tuning and highly scalable modern data warehouse, that is easy to set up and manage, and doesn't require a database administrator. This enables businesses to get up and running in seconds and gain faster insights due to blazing-fast queries.

[4] https://assets.unisys.com/Documents/Global/Brochures/BR_190124_DigitalBankingForACommunityConnection.pdf

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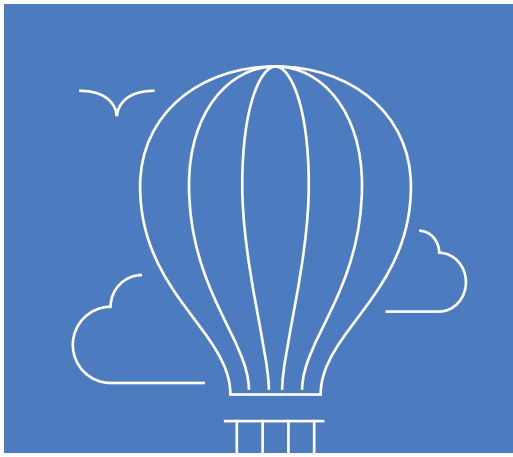
Real-time:

In addition to an overall increase, the type and nature of data has changed as well. Existing systems were generally built to handle batch, end-of-day data, but retail bankers today require insights from both batch and streaming data sources for holistic insights. According to IDC, this demand will continue to grow, as by 2025, roughly 1/4 of data will be streaming in nature. With a modern data warehouse, retail bankers can obtain real-time insights across business events as they unfold. The ability to operate in real-time is essential in order to compete in modern markets.



Predictive Analytics:

As the need for business to operate with insight in real-time as well as respond to needs such as fraud detection, it is necessary to move beyond simple, descriptive analytics and generate advanced illumination. As a modern data warehouse, BigQuery simplifies predictive analytics by enabling users to run machine learning models out-of-the-box with simple SQL. ANZ Bank reduces credit analysis time from 5 days to 20 seconds with parallel systems, using BQML.

ANZ

Enriched Insights:

Enterprises operating disparate data systems have struggled to gain holistic, enriched insights. Traditional data warehouses have contributed to the challenge because they are siloed solutions that contribute to this IT sprawl.

Today's organizations need a modern data warehouse that seamlessly interoperates across a platform of analytics solutions to generate holistic insights. BigQuery natively integrates across Google Cloud's smart analytics to deliver aggregate insights. For example, with BigQuery, users can run federated queries across external data sources from right within the data warehouse to generate even richer insights. Data analysts and data scientists can transfer data from over 100 business applications and tools, such as Marketo, YouTube, Salesforce, etc., to integrate and augment results.

Reliability:

Moving away from fixed, on-premise compute resources enhances reliability because it helps to remove geographical points of failure as well as the very real problem of a surge in demand (or denial of service attack) that can slow or cripple critical applications and functionality. Furthermore, the resilient automation capabilities enabled by cloud create an immutable infrastructure across geographies. In a certain sense, increased reliability in and of itself is enough reason to support the adoption of public cloud.

Data Protection:

As described above, public cloud can help increase the security posture of the enterprise to protect your data and enable you to operate with trust. One example is Cloud Data Loss Prevention (DLP), which can improve security by providing fast and efficient classification and redaction of sensitive data elements using techniques like masking, secure hashing, tokenization, bucketing, and format-preserving encryption. DLP is a prime example where the superior processes arising from the public cloud can significantly move the needle on improving policy and process.

Cost Optimization:

Many, if not most, conversations on migration to public cloud start with the promise of lower costs and for good reason. Not only does a "pay as you go" plan provide better economy, it also exposes the use of resources so that costs can be properly assigned and, at the same time, automated technical operations allow for your workforce to be deployed to new, more productive areas of endeavor when appropriate.

On the other side of the coin, migration to a cloud-based data warehouse is not without its challenges, which include:

Data Residency:
In some cases, there are regulatory restrictions that mandate that sensitive personal and financial data must be held in a specific geographic area or location. Care must be taken in such a situation because regulatory penalties for failing to meet these requirements can be severe. One obvious solution is to maintain some level of on-premise data storage to handle such requirements, but most public cloud solutions can also conform data storage practices to the requirements of geo-based storage regimes.

Project Complexity:
The scope and scale of the opportunity for data rationalization is both a blessing and a curse: the rewards are plentiful, but the size of the project can be daunting. Efforts that attempt to boil the ocean and solve all issues in one grand plan are bound to end in frustration. The best path is to be strategic in planning but tactical in execution. Taking smaller bites of the apple has the added benefit of helping to drive buy-in from stakeholders as the benefits of early efforts prove the efficacy of a planned strategic approach.

Multi-cloud Complexity:
The world might be much simpler if there was a binary choice between on-prem and one public cloud, but the reality is much more complex. Not only are there multiple public cloud providers, with Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) being the big three, but private cloud solutions are also present alongside on-premise solutions. Product and service differentiation between different cloud providers as well as corporate strategies that aim to avoid vendor lock-in or overreliance guarantee that vendor complexity will persist.

Cost Management:
The promise of dramatically lower costs with cloud solutions isn't always achieved because controls and policies that track and manage actual cloud resources are poorly formed, improperly implemented or both. Care must be taken to build strong monitoring capabilities for the management of cloud resources and rigor should be applied to make sure that these policies are strictly enforced.

Absence of Fundamental Change:
Too often, the arrival of cloud data management is viewed as a panacea that will solve problems simply because it is new, flexible, and more cost efficient. Such a view ignores the simple reality that failing to address the fundamental issues that lie at the heart of the data management problem will simply delay the inevitable and may, in fact, make matters worse. It is critically important that a change program takes a good, long look at capabilities, operating model, and incentives while attempting to form the desired future state in order to ensure that incremental changes are tailored to the enterprise, performance is measured, and results align to the business objective.

Best Practices in Cloud Data Management

Given the promise that the cloud brings to assisting financial services in managing opportunities in data management and the pros and cons listed above, what are some of the best practices that should be followed in such a program?

Establish Data Stewardship:
Building roles and responsibilities across the organization regarding who is to own the data will be key to effective data management. Many organizations think the ownership of the data quality will live with the IT organization, since they may own the tooling to perform the data management. This approach can be detrimental, as IT will lack the context of what the data means and how it is used. A strong partnership between IT and appropriately established data stewards from the business is a critical component of success.

Address Data Quality:
Most organizations have large amounts of ungoverned, disparate data that is critical to their business processes. This lack of process and tooling invariably creates a multitude of data quality issues. In nearly all cases, data quality is an issue that must be addressed. Years or decades of haphazard data management will likely have created a tangle that needs to be sorted out. The objective is to create robust comprehensive master data management protocols through comprehensive data discovery and assessment.

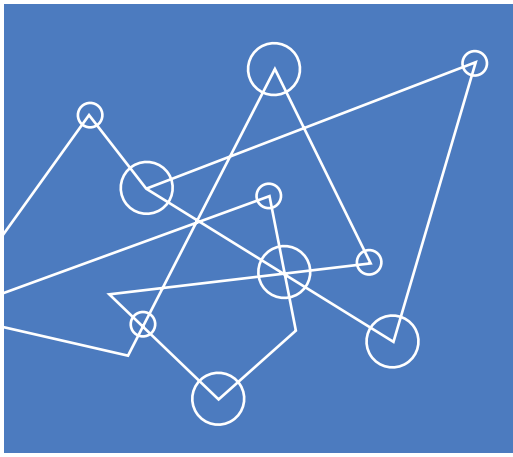
Maintain Data Lineage:
Once the data tangle is organized, it's important that lineage, catalog, and quality be used to maintain data going forward. Strong data lineage practices enable self-service data curation and data science by minimizing the dependence on data engineers for exploratory efforts. More recently, data lineage serves a new purpose as increasingly important regulations such as the "right to be forgotten" in GDPR and the California Consumer Privacy Act carry real and sometimes expensive repercussions if they are not followed.

Manage Data by Classes:
Further, creating classes of data such as bronze, silver, and gold can be valuable to discuss the phases of activities. Bronze would be considered the raw data, silver would represent the cleansed and governed data, and gold would be the blended, ready for reporting data. One key goal for IT should be delivering specific master data sets as an endpoint of the silver layer, such as a definitive customer master, security master, etc. Doing so allows for added efficiency as end-users can quickly and effectively gain access to only the information that they need and, at the same time, understand the source and lineage of the data. It is important to maintain both consistency and clarity so that all of data management is optimized.

Focus on Security:
Public cloud offers a superior approach to data security along with a comprehensive suite of tools with which to implement policies, but a number of steps must be taken so that maximum protection is assured. Areas to be addressed include rigorous and regular audit protocols, access control based upon strict governance policies, and tokenization of data such as PII/NPI, an issue that we addressed in our white paper: "Securing PII Data in the Cloud for Financial Services."

Additional Emphasis on Data Protection:
If data is the new oil, then a data breach is akin to an oil spill: messy, expensive, difficult to clean up and something to be avoided at all costs. Beyond the security steps highlighted above, it is important to adopt additional methods of protecting data including encryption both at rest and in transit, data masking and permanent deletion of data that is no longer needed. This step cannot be overemphasized!

Tackle Cost Efficiency:
Too often, the promise of cloud-enabled efficiency is unfulfilled because the consumption model is not well thought out. In the simplest sense, it is inexpensive to store data in the cloud but expensive to retrieve it. The best solution will recognize this fact and create a framework whereby compute in the cloud will be maximized and data extraction minimized.



Enable Frictionless Consumption:
One way to maximize efficiency and, at the same time, provide optimized tools and processes for end users is to work towards enabling frictionless consumption. Take the time to understand how the data will be consumed and by whom by working with the data engineering teams and end users. It is critical to establish detailed profiles of the users and downstream processes using the data. Lowering friction means for some users simplifying tools, for others providing more complex tools with more robust features. Doing so leads to a greater democratization of data while maintaining the proper guardrails in terms of security.

Adherence to best practices that include robust data lineage, rigorous data cleansing, transparent data quality and thorough data cataloging will lead to direct benefits for the enterprise that include:

- Inherent trust in data
- Maximum data availability
- Efficiency through reuse over redundancy

As opposed to traditional platforms where value is lost from the source data in each step from ingest to secure and on to transformation and insights, a modern data warehouse approach adds more value at each step in the process and spreads that value further and further across the organization. The result is transformative.

The Cloud Advantage in Data Warehousing

Change is coming to retail banking and it's likely going to be big and fast rather than incremental and slow. As Adam Dell predicted, the change is going to affect everyone, whether they think so or not.

New technology in all its forms and manifestations is at the foundation of this change and none is more central to the shift than the emergence of the public cloud. From lowering costs to accelerating the pace of innovation and delivering exciting new functions and features, the public cloud is at the root of the changes that promise to shake-up the retail banking industry.

Data warehousing lies at the heart of this movement as the foundation upon which profound transformation can take place. Modern data platforms make it possible to unlock new capabilities and provide more efficient management of data. Improved capabilities and efficiency are essential to achieving your competitive advantage. Make no mistake: doing so takes hard and careful work, and it's essential to leverage relevant experience to evaluate the journey that is upon us.

Anthos as an Answer for Data Platform Complexity Challenges

The adoption of new technology should always come with an asterisk: what is simple on paper is usually complicated in the real world. In the case of cloud, it would be easy if public cloud was the starting point for data management but the reality is that on-premise, private cloud and multiple public clouds are all part of the mix of available and utilized resources.

As discussed in "Multi-Cloud Complexity" above, there are important questions that need to be addressed for data management that utilizes multiple, diverse types of technology solutions. One incredibly powerful tool that can help manage this mix is Anthos. Simply put, Anthos is a comprehensive cloud platform that acts in this case as the unifying technology to bridge diverse and disparate data management sources in one powerful and seamless deployment across all solutions.

Anthos serves as an invaluable platform as an enterprise tackles the task of infrastructure modernization. It facilitates the safe and controlled migration of data from existing to cloud deployment as well as serve as the central management component between an optimized blend of on-premise and cloud-based resources.

For further information on Anthos, please download our Enterprise Guide to Getting Started With Anthos.

Companies seeking to accelerate performance rely on Maven Wave, an Atos company, for innovation-driven digital transformation. Maven Wave is a leading Google Cloud Premier Partner, guiding businesses through every stage of their cloud journey. Google Cloud enables companies to rapidly and cost-effectively scale up infrastructure while capitalizing on advanced analytics, machine learning, and other powerful capabilities in the cloud.

To learn more, contact us now.

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