Analytics in Action with Teradata Cloud

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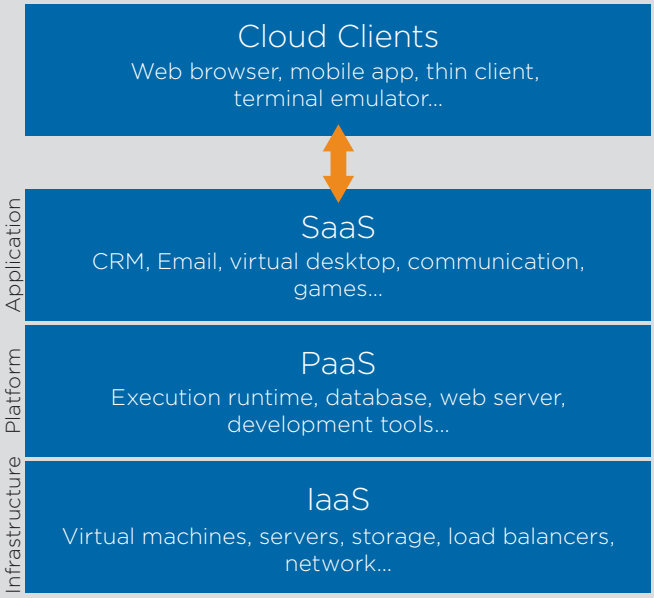

This study examines business use cases for Teradata Cloud. Our interviews surfaced a spectrum of business motivations for adopting cloud services, along with tradeoffs and challenges. The study illustrates that companies can leverage cloud services to rapidly provision innovative applications and exploit unanticipated business opportunities. The study concludes with recommendations to executives for assimilating the cloud mindset of "agile and quick" into their corporate culture.

Context

The term 'cloud' is often misunderstood, even by information technology (IT) professionals. The term implies that computer resources are treated as a service, rather than as a product that is purchased and owned as capital equipment. An apt analogy is of an electrical utility supplying electricity over a grid. One pays per kilowatt/hour every month for this service. If one discontinues their electrical service, no ownership has accrued in the power plant.

Cloud services are priced based on the nature and duration of the type of service. The services can be complex and wide-ranging, hence the cause of confusion. The industry generally divides cloud services into three layers, as shown at left.[1]

From bottom to top, Infrastructure-as-a-Service (IaaS) supplies access to the basic compute, storage, and networking equipment, along with power, cooling, and security. Platform-as-a-Service (PaaS) supplies access to a preconfigured platform with an operating system, development environments, database, web services, and the like. Software-as-a-Service (SaaS) supplies a certain software package for a business function, like email marketing campaigns. The three layers increase in functionality and complexity, with the exciting developments occurring in the top SaaS layer.

In this study, we interviewed companies who adopted Teradata Cloud[2] as a critical component of their IT architecture. Teradata provides cloud services in three core areas:

- Data warehousing (with the Teradata® Database platform)
- Big data analytics (with the Teradata Aster® Discovery Platform)
- Data management (with the Teradata Portfolio for Hadoop)

These cloud services range from basic platform support, to enhanced functions, to consulting services. Teradata Cloud is priced by monthly cloud compute units (CCU), which include hardware, database software, storage, and system management utilities specifically engineered for cloud computing. Teradata Cloud customers can focus on extracting business value rather than managing underlying infrastructure—and pay for services via a monthly, 1-year, or 3-year subscription.

Experiences

This section documents the experiences of nine Teradata Cloud customers based on anonymous interviews with knowledgeable persons. The table below lists the companies, along with their specific challenges.

These customers represent a potpourri of companies of various sizes, IT environments, and industries. The only common characteristic is that all chose to adopt Teradata Cloud as a significant component of their IT infrastructure. This study does not compare or contrast Teradata with other vendors. Instead, it probes the business and technical factors that motivated these companies to adopt these specific cloud architectures.

Explore each of their stories, and imagine that you are one of the participants. Would you have 'gone cloud'? The subsequent sections summarize each customer story as recurring themes, concluding with recommendations for executives.

Company		Company Challenges
A	Regional Healthcare Broker	Complex biz processes, rapid growth
B	Regional Commercial Real Estate Firm	Knowing clients' consumers, spreadsheet IT
C	National Satellite Entertainment Provider	Mature IT at capacity, looking for cost saving
D	International Internet Entertainment Provider	Be flexible and agile, move to cloud
E	International Video Gaming Firm	Manage revenue from many game players
F	National Cable Provider	Retain customers, IT uncertainty
G	Global Manufacturing Conglomerate	Drive brand loyalty, protect mature IT
H	National Nutritional Marketer	Rapid growth, IT at capacity, track loyalty
I	Regional Retail Discount Warehouse Chain	Do smart discounting via POS analytics

A – Regional Healthcare Broker

A rapidly growing healthcare provider found a unique business opportunity within the complexities of the U.S. healthcare system by providing two functions. In the first function, the company is a service broker that matches required patient services as specified by a hospital to the best service provider. In the second function, the company is a financial manager that negotiates rates with providers, collects payments from insurance firms or patients, and reimburses the providers.

An example is when a hospital orders an oxygen bottle for a discharged patient. The company obtains approval from the patient's insurance company, contracts with the appropriate service provider to deliver the bottle to the patient's home, receives payment from the insurance company, reimburses the service provider, and then repeats this process weekly as long as the patient requires oxygen.

The company must handle a complex sequence of transactions requiring medical knowledge and precise data management. This is a fast growing business driven exponentially by the various combinations of patients, providers, and services. To support services monitoring and billing every week, the simple example of an oxygen bottle generates "lots of data," resulting in many terabytes of operational data monthly. Finally, the processing of this data must progress beyond descriptive reporting and involve analytics to understand the changing dynamics of their business. For instance, the analysis of revenue margins among providers for the same service is critical to maintaining the company's profitability.

Company Challenges

- Critical and complex biz processes
- Rapid unpredictable biz growth
- Growth limits with on-premises facility

Business Problem

- Critical operations mixed key analyses
- Concern for data privacy/security
- Elasticity to acquire capacity quickly

Cloud Solution

- Managed cloud services via SLA
- Custom data architecture and apps
- Future: cloud-based disaster recovery

> "We are not sure what we will need in 18 months because tomorrow we may need twice the capacity."

To be successful, the company must expand rapidly amid a future of unexpected IT demands. The challenge is creating an agile IT infrastructure that supports their complex business. When asked about an on-premises computing facility, the thought of maintaining the required power, cooling, lighting, and staffing was overwhelming. Further, the company viewed the rigidity of an on-premises facility and its staffing as a serious limitation to their growth. They explained, "We are not sure what we will need in 18 months because tomorrow we may need twice the capacity."

With the uncertainty of business growth as a major consideration, the company pursued a cloud architecture by adopting Teradata Cloud. In particular, managed cloud services with Teradata relieved the company of most of the care and feeding of its data warehouse, such as data loading routines, performance tuning, and the like. They could have both production and development systems, with the option to add disaster recovery systems in the future. The elasticity of cloud architecture enables the company to lease additional nodes within a few days. Further, the company requires a service level agreement (SLA) for operational transactions (such as three seconds to process 95 percent of certain queries), thereby minimizing the impact of analytic processing on its operations.

Security and privacy of healthcare data was a major concern for the company. After working through the legal and technical issues, that concern was resolved and the company approved a contract for Teradata Cloud. The company is currently starting the migration of their Oracle system into the cloud. Future phases will refine the data model to enable deeper analysis.

In summary, the company chose managed cloud services from Teradata to sustain their unpredictable growth in a rapidly expanding business. As a healthcare provider with plans for increased growth, the company views the cloud as an opportunity to focus on its core competencies and maximize the delivery of critical healthcare services.

B – Regional Commercial Real Estate Firm

A commercial real estate firm, providing office and retail spaces, needed to enhance the value of its property management services. The company decided to pursue a digital strategy to establish a direct one-to-one relationship with the consumers coming to its properties. For instance, the company manages many large shopping malls, each with hundreds of stores that may attract thousands of people per day. For each mall, the company wants to understand the interests of those people as a way to maintain a competitive advantage over nearby malls.

Eventually, the company will use location-based social data, such as Facebook, Twitter, and Foursquare, to detect people shopping at other malls and send messages to attract them back to their mall. By driving traffic to their properties, the company can maintain higher occupancy and justify higher rental fees. By tracking demographics, the company is able to match clientele to stores and suggest appropriate store locations to retail clients to maximize their sales for specific brands. Large consumer goods firms have coined this approach as consumer relationship management.

Company Challenges

- Value-add knowing clients' consumers
- Spreadsheet IT infrastructure

Business Problem

- Consumer relationship + social media
- Retain data ownership with third parties

Cloud Solution

- Excel fork-lift as initial DW in cloud
- Future: Extend with geo-social media

> "We have not traditionally had significant IT needs."

The company has not made large investments in IT or in creating a data warehouse. "We haven't traditionally had significant IT needs." The company's business is mainly managed by outsourcing specific functions to third parties and by many Excel spreadsheets for the rest. Hence, the company decided to search for a managed-service IT solution that avoids purchasing on-premises equipment.

The company wants to avoid "locking up data" in systems controlled by third-party agencies. If the company terminates a key contract with an agency, that data may be technically and legally difficult to retrieve. They remarked, "At the end of the day, we should own the data." If the company decides to change agencies, staff can simply change passwords and supply the login to the new agency.

The company researched the IT options during the fall of 2014 and selected Teradata Cloud. The company plans to put its digital strategy into production in summer 2015. Long-term plans involve performing business analysis on corporate financial data as an initial step for a data warehouse strategy. When asked about the key motivation for a cloud solution, they cited the Consumer Relationship Management strategy as being aligned to their future directions.

In summary, the company is proactive in establishing direct relationships with the consumers patronizing its property clients. With little IT infrastructure, the company chose a cloud architecture as a quick and flexible solution while maintaining ownership over critical data. The company is striving to increase its rental/leasing revenue by understanding consumers, while creating profitable commercial environments for clients.

C – National Satellite Entertainment Provider

A large entertainment service provider has aging hardware systems, some of which are nearing their limits or facing reduced support from vendors. The company has a mature IT group that operates its own data center. In addition to maintaining a large corporate data warehouse, their production applications range across all the corporate functions, including managing a large service fleet to install and repair devices among their customer base. The company faces major capital investments in hardware upgrades, which is referred to as a "floor sweep" of the data center.

As a leading technology-driven firm, the corporate board urged executives and IT managers to consider cloud architectures as a cost-saving measure within the IT function, along with enabling the company to scale rapidly to meet future business opportunities. In 2013, executives started discussions with Teradata to provide cloud services for development and testing. The executives viewed this as a learning phase for understanding cloud architectures and evaluating the transition of their production systems to the cloud. Teradata performed a user acceptance test as a proof-of-concept for the development services. The performance results were positive, showing a doubling of capability over their existing development system. The elasticity test started with two nodes of processing power, increased to eight nodes, and then reduced to four nodes. All went smoothly, demonstrating linear scalability. The company could vary that processing power of the Teradata Cloud with 24-48 hours of notification.

Company Challenges

- Mature IT is at capacity
- Cost saving with IT function

Business Problem

- Avoiding large capital expenditures
- Exploring cloud for enterprise systems: dedicated circuits, privacy, DBA tasks

Cloud Solution

- Development system in cloud
- Future: moving toward full cloud IT

The company faces a "floor sweep" within its datacenter to replace aging hardware systems.

Executive support was strong, and a contract was signed with Teradata. However, the IT group remained skeptical. In particular, there was a broad concern over the following three issues.

First, the IT group felt that data should flow over dedicated circuits and not over the public Internet. Acceptance testing did not measure the eventual security of data flow to/from the cloud since it would take several months to provision a dedicated circuit.

Second, confidential data (especially personally identifiable information) should be 'masked' within the cloud data warehouse services using encryption or tokenization. Since the current databases were hosted within the company-owned data center, this data masking was considered unnecessary. Even if Teradata could demonstrate that its external security was stronger than that of the company's data center, there was the possibility that a Teradata employee might see data about customers. The company is investigating the expense and effort for data masking as a solution.

Third, database administrators (DBAs) are allowed full administration rights ("root access") to on-premises data warehouse systems. As trusted and skilled personnel, they can perform their low-level DBA tasks easily and quickly. With cloud-based data warehouse services, the DBAs would submit such requests for routine DBA tasks to the Teradata Cloud operations team, adding a coordination layer. For a dev/test system, the DBAs were concerned with such limitations.

The corporate datacenter is located one hundred miles from the IT group, while the Teradata Cloud data center is seven hundred miles away. The meaning of on-premises systems becomes fuzzy since neither case allows DBAs to "watch the lights flicker." The issue with DBA tasks is not physical location but responsibility for these tasks. The Teradata Cloud operations team now handles routine DBA tasks, such as backup/recovery and software maintenance, while the company's DBAs can focus on performance tuning and other application-specific problems.

In summary, the company faced a limitation in IT capacity, investigated the issues with cloud architectures, and decided upon Teradata Cloud for its development system. The company realizes that it must investigate cloud solutions to supplement its traditional IT systems. A development system is an excellent place to start for this company.

D – International Internet Entertainment Provider

An international provider of internet entertainment is moving fast and is constantly "figuring out what it needs to be." Responding to market pressures and opportunities, the company has rapidly changed core business processes over past years. The company stated, "We will make mistakes but that's okay if we fail forward," recovering fast with innovative solutions. The company views being flexible and agile as essential to its business success.

Learning from a major data center outage several years ago, the company made a strategic decision to move its entire IT infrastructure to the cloud and eliminate its data center. The company concluded that it should not be "in the business of managing a data center nor tied down to the IT limitations of the physical data center."

The company migrated its entire suite of production applications and customer-facing operations to Amazon Web Services (AWS). Their opinion was, "AWS has given us so much flexibility to do things that could not have been done in our data center." Teradata Cloud supports all corporate reporting and analytics, using MicroStrategy, Tableau, and homegrown visualization tools. Analytic applications are now operational on Teradata Cloud, such as A/B testing to detect trends in customer behavior, retention metrics to reduce customer churn, customer segmentation to target email campaigns, and accurate Sarbanes-Oxley Act financial reporting. The company stresses the importance of A/B testing throughout its customer-facing applications to "prove the value of our services to our members."

> "We are a highly data-driven company that considers the data warehouse as a single source of truth."

The company is pleased with "achieving a seamless integration between Teradata Cloud and our AWS infrastructure." Teradata is collaborating with the company to ease the migration of large IT infrastructures into the cloud by enabling easy provisioning of cloud services and enhanced scalability of computing resources.

The company advised that other firms exploring cloud architectures should have the proper "mindset." The company's view is that cost should not be the primary motivation when deciding on cloud architectures. In contrast, the preferred motivation should be flexibility to meet those unexpected business demands that suddenly require bold action. Cloud architectures are more scalable in meeting those demands, avoiding hard limits imposed by physical facilities. Because of the company's goals of being flexible and agile, executives are "completely sold on the cloud and excited about the potential of emerging cloud technologies."

In summary, the company is a fast-moving business requiring flexibility and agility as provided by cloud architectures. The company has created seamless integration between Teradata Cloud and AWS to couple its corporate data warehouse with its customer-facing operations. As the company expands its customer base globally, it will push the limits of cloud technology.

Company Challenges

- Mandate to be a flexible and agile biz
- Strategic decision to move into cloud

Business Problem

- Eliminate limitations of data center

Cloud Solution

- Multi-cloud: Teradata + AWS
- DW as the hub for analytics
- Future: Leveraging cloud innovations

E – International Video Gaming Firm

A mobile games studio, publishing top-ranking games, surpasses more than 500 million downloads and serves nearly 50 million players. Each game is published on all leading mobile and web platforms including Google Play, iTunes, Amazon and Facebook. The company's games use the freemium model, implying they are free to download but also offer in-game purchases of premium content, power-up items, and accelerated game play features. The company's revenue comes directly from these in-game purchases. Delicately crafted gameplay mechanics within its games are critical to the company's overall success. Each game is playable and challenging, offering a rewarding and compelling experience. By ensuring an optimal gameplay experience, the company keeps players engaged and loyal to its game titles while enhancing its revenue. The business challenge is to acquire, engage, and retain players for longer durations than competitors and to provide value from the in-game purchases.

Through social media integration and deep social graphing, each game play returns a treasure trove of analytic data about its player base, gathered by a real-time tracking server on the back end. Types of data gathered include play duration, high scores, achievements, social graphic, demographics, and much more. Leveraging this data, the company can provide detailed and in-depth data about its overall player base to its executives, investors, and board members. Further, by listening to the heartbeat of its users, the company monitors its data in real time to consistently adjust and refine its games in real time. These adjustments ensure optimal playability and player loyalty and ultimately maximize revenue generation in a long-tail fashion.

> "We need to listen to the heartbeat of our users."

Company Challenges

- Millions of players and hundreds games
- Manage revenue from game players

Business Problem

- Monitor game play quality in real-time

Cloud Solution

- DW in cloud for financials and ops
- Future: Analytics on life-time value

The legacy data warehouse was under extreme stress, requiring eight hours to generate useful results. The company was under a tight timeline to provision a new solution. Because of positive experiences with data warehousing solutions from Teradata, the company selected Teradata Cloud as its data partner. In particular, the company cited Teradata Cloud for its accessibility and nimble architecture as the perfect solution for its demanding data requirements.

The tracking server now captures game play data in CSV files and loads it every fifteen minutes into Teradata Cloud for immediate reporting. The company intends to expand its reporting into predictive, lifetime models for players who spend the most on in-game purchases. The analytics inform the developers, ultimately yielding higher engagement and lifetime revenue per user.

In summary, the company is achieving financial success by simultaneously developing new and engaging games, as well as innovatively managing its intellectual property. The ability to generate timely financial reports, along with concurrently running predictive analytics, was a key motivation for adopting Teradata Cloud.

F – National Cable Provider

A large national cable provider has a business-critical application for price elasticity, which predicts customer churn based on consumer billing history, income, and credit scores. The results optimize pricing of service contracts.

The price elasticity application has complex logic written by a third-party contractor several years ago and currently takes 80 hours to generate weekly/monthly batch reports using a complex algorithm. Further, it executes on hardware nearing its end-of-life for which system reliability is failing and vendor support is fading. The company needed a quick replacement.

Company Challenges

- Biz depends on customer retention
- Corporate uncertainty in IT function

Business Problem

- End-of-life for critical churn app
- Long replacement time for on-premises
- Avoiding large capital expenditures

Cloud Solution

- Cloud for a quick replacement
- Delays from VPN security and IT reorg
- Future: Cloud as bridge to on-premises

Consider cloud solutions as a 'temporary bridge' to a future hardware purchase.

For its traditional big-box data center, the hardware purchase and installation of an equivalent system would take close to a year to become production ready. The company started to consider cloud solutions as a 'temporary bridge' to a future hardware purchase. In 2014, Teradata offered a creative cloud solution that met the company's requirements from usage and financial perspectives.

The company was pleased with the rapid implementation, successful benchmarks, and payment model using operational expenses, along with Teradata's flexibility to customize a solution for its specific use case. As of January 2015, the company is migrating the price elasticity application to Teradata Cloud, delayed by security policies with VPN protocols and a possible reorganization of IT functions.

In summary, a large mature IT shop has a critical business application that is nearing end-of-life on its existing infrastructure, while the typical purchase and installation solution was cost and time prohibitive. The Teradata Cloud solution provides the company the ability to extend the life of a critical application, enabling a medium-term bridge to continue operations and allowing the option to bring the application on-premises at a future time.

G – Global Manufacturing Conglomerate

A global manufacturing conglomerate sells an array of branded products through various retailers and distributors. Hence, detailed data about its consumers is not directly available to the company. However, the company does regularly interact with consumers via its websites, social media, and contest. The company launched a major initiative for consumer relationship management to integrate this data, segment its consumer base, and market directly to consumers via digital channels.

The goal is to drive loyalty by having a meaningful and timely relationship with many of its consumers. The justification was based on shifting part of its large advertising budget to directed digital marketing, which is judged more efficient.

Although the company has considerable IT infrastructure on-premises, it decided that the Teradata Cloud approach provided the desired flexibility and speed required for this new initiative. The company could also avoid any impacts on the existing production environments and IT staffing. In the future, any deployment on Teradata Cloud could be migrated back, if needed, to on-premises facilities since all the software is compatible.

Company Challenges

- Drive brand loyalty of consumers
- Mature on-premises IT infrastructure

Business Problem

- Consumer relationship + social media
- Privacy concerns over personal data
- Avoid impact on operational systems

Cloud Solution

- Analytics in cloud
- Anonymized personal data
- Future: Dev/test system, Hadoop data

> "Impacts on the existing production environments and IT staffing could be avoided."

Privacy concerns about consumer data are a priority since the company collects consumer data throughout the world. Because some countries have legal restrictions to prevent personal data from leaving national boundaries, the company has established AWS instances that physically reside in each country. Before the data is analyzed at the Teradata Cloud facility in Las Vegas, it is anonymized with a non-personal identifier tag.

The company's digital advertising agency performs a segmentation of consumers into similar groups based on brand and country. The analysis is currently descriptive, using Tableau and Roambi with SAS and R advanced analytics in the planning stages. This working solution is necessary for establishing internal credibility, thus increasing participation by internal units responsible for the various brands.

A challenge is the compatibility of VPN connections over the company's corporate network, which has limited internal access. In the future, it is also considering Teradata Cloud for a development and testing (dev/test) system. The elasticity of Teradata Cloud was ideal since realistic stress testing to production levels requires many times the power of a typical dev/test system. Often new systems are not truly stress tested until they are switched into production status. In contrast, dev/test systems sit idle most of the time, waiting for the testing of the next production release. Hence, a cloud-based dev/test system can be mostly supported at a low level with brief periods of peak capacity, thus resulting in saving costs.

In summary, the company is driving brand loyalty via consumer relationship management by supporting this initiative with Teradata Cloud, which captures and analyzes consumer-related data. By anonymizing personal data, the company has alleviated privacy concerns about personal consumer data crossing country borders. Moreover, the Teradata Cloud solution avoids impacts on operational systems on-premises.

H – National Nutritional Marketer

A multi-level marketing firm focused on selling health-related nutritional products by word-of-mouth has a rapidly-growing business that is putting demands on the current IT system. It needed the usual range of typical management reports, along with data on customer loyalty trends and key performance indicators for commission payments.

The current Microsoft SQL Server infrastructure, however, was nearing its limits and required additional server hardware and ETL (extraction, transformation, and loading) software. In addition, the company wanted to add social media data to better track loyalty trends. After surveying the alternatives, the company realized that a managed cloud solution from Teradata and MicroStrategy is less expensive than upgrading the current on-premises system. Hence, their Teradata Cloud has been in production for three years.

Company Challenges

- Rapid growth pressuring IT capacity
- Biz dependent on customer loyalty
- SQL Server requires h/w upgrade

Business Problem

- Increase IT capacity economically
- Track customer loyalty trends

Cloud Solution

- Multi-cloud: Teradata + MicroStrategy
- Future: Social media to track loyalty

The company has a unique multi-cloud architecture. Teradata provides data warehouse services via Teradata Cloud, which is responsible for data loading from the Microsoft SQL Servers and for data warehouse administration. MicroStrategy provides a second cloud service supporting the report generation. Thus, it is a true cloud-to-cloud architecture dividing the responsibilities of database management from report generation.

For instance, if a new column is required on a report, the company requests the MicroStrategy service to perform the change. If that data is not already available in Teradata Cloud, then the company must request Teradata to add the new data to the data warehouse, ensuring that the new data is properly transformed and loaded. Then the MicroStrategy service can perform the report modifications.

The company was initially concerned that limited network bandwidth between the Teradata and MicroStrategy cloud services would affect performance. This problem did not materialize since the bandwidth is more than adequate.

The vision is to add more data sources, especially in social media. At this time, the company is exploring how to utilize this new data so that it demonstrates a credible ROI for the business.

In summary, the company illustrates a solution using a multi-cloud architecture where two vendors have divided responsibilities. The company is also able to support its IT operations economically with a small staff.

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I – Regional Retail Discount Warehouse Chain

A discount warehouse chain with about a hundred stores over ten states has a simple sales strategy. As customers enter the store, large signs over big boxes of items advertise all the items on sale that day. It is critical for store managers to know which items are selling or not so that they can adjust daily the items on sale. In addition, corporate managers needed to see the big picture of how stores are performing and then drill down into problem areas. There was a past incident where an item sold at an unintentional loss for several weeks before the company detected and corrected the situation. The company concluded that better information and coordination was required between store and corporate managers.

Two years ago, the company hired a new manager of IT services from a larger retail company. He knew the potential business value that could result from data analytics, but he needed to demonstrate that value within his new company. By analyzing all point-of-sale (POS) log data, he could generate more insights into the shopping basket for each customer so that the company could understand purchasing trends, promotion effectiveness, and product profitability to guide daily promotions and store layout better.

The company is a long-time IBM iSeries (aka AS-400) shop, which is inadequate to support POS analytics. The traditional approach of purchasing the proper systems for their data center would incur high initial costs and long implementation times.

Company Challenges

- Biz depends on smart discounting
- Limited IT based on IBM iSeries reporting

Business Problem

- Lack of point-of-sales data analysis
- Low-cost alternative for enhanced IT

Cloud Solution

- Hosted DW extending current system
- Future: Biz analytics & mobile apps

The company chose Teradata Cloud as an alternative with a low-cost.

The company chose Teradata Cloud as an alternative with a low-cost. As a PaaS offering, Teradata hosts a Teradata data warehouse appliance on a private cloud, allowing the company to maintain full control of the system. The company's IT staff connects directly to the cloud appliance to perform data administration and application development tasks. The implementation was quick. Beginning in the fall of 2013, the company was able move its data, users, and analytics from the IBM iSeries to Teradata Cloud in eight months.

Capturing and analyzing the POS data now enables the company to track trends. Using MicroStrategy, the company can understand their sales trends by the entire company, regions, stores, and even departments within stores. The company is providing better service to their customers by offering the "right products at the right price and right location," along with seeing the impacts of product discounts to profit, shrinkage, and product mix.

The company realizes that they have just started a journey into business analytics. Current capabilities are limited to desktop applications with descriptive multi-dimensional analyses. However, its goal is to evolve its infrastructure to support predictive analytics and mobile applications. For instance, the company wants its store managers to predict accurately which sales will be profitable during specific seasons and have access to that information on mobile tablets while they roam the store floors. Moreover, corporate managers need to understand the dynamics of their customer segmentation using affinity analysis of market basket data.

In summary, the business requirement to introduce analytics into traditional IT infrastructure required the non-traditional approach of a cloud architecture, resulting in lower initial costs and fast implementation times. In addition, the cloud approach will support future plans for advanced analytics and mobile applications.

Why Cloud?

These case stories describe the experiences of nine companies that adopted cloud services, specifically Teradata Cloud. What were the recurring themes that motivated these companies?

Product vs. Service

The age-old distinction of "X-as-a-Product versus X-as-a-Service" clarifies the variety of motivations as to why these companies adopted cloud services for their information architectures. Cloud technology has matured to the point that a company has the choice of supporting their IT architecture by purchasing hardware and software to reside on-premises within their data center, or by purchasing cloud services that reside within a virtual data center, or by mixing any combination of these options.

Five years from now, this product-service choice for IT will be as mundane as whether to purchase or lease office space. You would do the math and choose the most economical alternative that satisfies the requirements. For any complex corporation, the choice for managing office space is usually some creative combination of purchasing and leasing. Likewise, the same corporation will probably find their optimal IT choice within these creative combinations. Moreover, it is likely that this creative IT combination will be constantly changing as it is with office space based on business factors, financial issues, and technology evolution.

The table below compiles the motivations for each company for 'why cloud.'

There is a healthy spectrum of motivations, as summarized in the following three themes.

Crazy Business Growth

Several companies remarked that they must plan for crazy business growth. This growth was rapid, unexpected, and unpredictable, along with being disorienting and even scary. This growth was not normal.

Consider this: How long would it take your IT infrastructure to change radically in response to crazy business growth? Days? Months? Years? For most companies, major IT changes that occur in less than a few months are unthinkable. As these companies illustrate, the previously unthinkable has become normal business strategy. Managing crazy growth enables these companies to realize business opportunities that competitors continue to believe are unthinkable.

Company		Why Cloud?
A	Regional Healthcare Broker	Rapid business growth
B	Regional Commercial Real Estate Firm	Data resides in cloud, retain data ownership
C	National Satellite Entertainment Provider	Cost saving (maybe)
D	International Internet Entertainment Provider	Need for flexible & agile > Must be in cloud!
E	International Video Gaming Firm	Business is in the cloud
F	National Cable Provider	Critical app at end-of-life, datacenter limits
G	Global Manufacturing Conglomerate	Data resides in cloud, firewall for personal data
H	National Nutritional Marketer	Rapid growth pressuring IT capacity
I	Regional Retail Discount Warehouse Chain	Limited IT on older h/w, need for POS analytics

Managing crazy growth enables companies to realize business opportunities that competitors believe are unthinkable.

The companies often cited elasticity of cloud services as the agility to react to major IT changes quickly and at scale. For instance, several companies mentioned, "Can't wait: deploy now and provision quickly" as their desire for cloud elasticity to expand/contract both compute and storage capacity. Company D has a corporate mandate to be a flexible and agile business, which resulted in a strategic decision to convert its entire IT infrastructure into the cloud. Company A did not want to deal with the limitations of an on-premises facility.

Ask yourself... Is there is a plausible situation where your company would experience crazy business growth? What would be the implications to your IT infrastructure? Would the expected business value mandate a huge increase in IT capability quickly? If plausible, be prepared by understanding alternatives for cloud architectures and gain experience early by adopting a small-scale cloud solution for noncritical applications.

IT Infrastructure Limitations

Several companies experienced capacity and technology limitations in parts of their on-premises IT infrastructure, which would have required major capital investments. These companies decided to switch to a cloud solution using Teradata Cloud rather than upgrading on-premises equipment and software.

For example, Company C is 'testing the cloud waters' with a new dev/test system, investigating a possible migration entirely to a cloud architecture. Company F had a critical application at end-of-life, with the vendor withdrawing support. Company H had a Microsoft SQL Server system in need of an upgrade but wanted to add analytic capability. Finally, Company I has an IBM iSeries system that was not designed for POS analytics.

In these cases, infrastructure limitations present an opportunity to consider alternatives like cloud solutions.

Ask yourself... In the coming years, which applications-system combinations will need upgrades? Would a cloud solution be a better alternative for your company?

IT Revitalization

Every IT system requires periodic revitalization, for which cloud services can be effective.

Company G noted that a cloud solution would avoid any impacts on the operations of their data center, especially given the new requirement to analyze large amounts of social media data.

Company F is in the process of replacing a critical churn application with a cloud solution. If needed, they can bring that application back on-premises in the future. The cloud solution solves an immediate business problem and provides an optional bridge to an on-premises solution.

Company C had a data center that was nearing its capacity limits. Thus, management wanted to consider cloud architectures. A cloud-based dev/test system is a low-risk step to exploring alternatives for cloud architectures. Moreover, the company can now leverage cloud elasticity to deliver high compute resources for brief periods of full-scale testing, while reducing compute resources for the long periods of low demand.

Notice that these three companies explored hybrid on-premises and cloud solutions, which exploited the flexibility to move in either direction as technology and economics change.

Ask yourself... Without risking stability or reliability of your data center, would cloud solutions provide ways of revitalizing that data center by augmenting or relieving existing infrastructure?

Why Teradata Cloud?

The previous section summarizes the motivations for choosing a cloud solution for part or all of the companies' IT architecture. This section will focus on their motivations for choosing Teradata Cloud rather than a generic cloud service. This is not a comparison for choosing a particular vendor over another. The motivations for this choice are much deeper, as detailed here.

Note that commitments to data warehousing and business analytics are central to choosing Teradata Cloud.

Data-Warehousing-as-a-Service

For emphasis, the section heading uses the term "data warehousing" instead of "data warehouse." Rather than a place or thing that stores data, the emphasis should be on structuring data to generate business value. The act of structuring gives context and purpose to the data that is specific to the company.

This is a continuous, never ending and often frustrating process. In the past, we referred to the objective as achieving a "single version of the truth" (SVoT). We now realize that such an objective is naïve. SVoT changes every

Company		Why Cloud?
A	Regional Healthcare Broker	• Custom (not canned) business processes • Complex, changing data relationships • Managed SLA on DW services
B	Regional Commercial Real Estate Firm	• Track record for Consumer Relationship Mgt • DW creation from Excel migration
C	National Satellite Entertainment Provider	• Teradata customer testing cloud waters • Cloud option with data center return
D	International Internet Entertainment Provider	• DW as SVoT and hub for business analytics • Alternative (AWS) did not do DW as well
E	International Video Gaming Firm	• DW with real-time analytics
F	National Cable Provider	• Quick replacement for critical app • Managed database (not DW) services • Cloud option with data center return
G	Global Manufacturing Conglomerate	• Track record for Consumer Relationship Mgt • Analytics that is separate from data center
H	National Nutritional Marketer	• Teradata as database, not data warehouse
I	Regional Retail Discount Warehouse Chain	• Creating DW with analytics • Also going mobile

The data warehousing journey has the objective of generating business value by giving context and purpose to data.

minute of every business day. Further, multiple versions are in play and in tension most of the time. SVoT is not a destination. SVoT is a journey without a final destination. The journey of data warehousing is the objective, in of itself.

Most of the nine companies have this mentality about data warehousing. For instance, Company D is the most extreme in its up-front executive policy to adopt cloud solutions. However, they chose Teradata Cloud because it delivered the best data warehousing service, as compared general-purpose cloud solutions. At the other end of the size scale, the motivation of Company A is its need to manage complex and changing data relationships, driven by rapid business growth. In contrast, the motivation of Company H is its need for database management for reporting, rather than embarking on the data warehousing journey.

Ask yourself... Is your company convinced that data warehousing (if properly managed) will generate business value from its data? Has your company made tangible commitments to this journey? If so, then focus any search for cloud services on data warehousing offerings.

Business Analytics-as-a-Service

Business analytics is much more than discovering brilliant insights into business dynamics. Business analytics is a complex value chain ending with operationalizing the analytics so that these insights make a difference in business strategies and processes. Insights that do not result in making this difference have no business value. Data science teams often focus on the early stages of the analytic value chain using separate specialized systems honed for data discovery and then stumble in the latter stages.

Two companies emphasized the business need for consumer relationship management to understand and market to the consumers who purchased from their clients. Company B wants to understand the consumers visiting their commercial properties, especially shopping malls. Company G wants to understand the consumers of their branded products, as bought at retail stores.

Emerging is the fact that a mature data warehousing tradition is a critical ingredient for realizing business value from business analytics. There are two reasons. First, the data within the data warehouse should be the best organized and officially certified information about the key dynamics of your business. This data should be the reference base for deciding what is important (i.e., what makes a difference) to your business. Second, the data warehouse is the hub to disseminate analytic results and to deploy changes ("smarts") to operational processes.

These companies used the cloud services to combine social media data with analytics, the results of which enhance data in the data warehouse. Cloud services can be a mixing bowl for new data sources that are analyzed in new ways within the context of reference data from the data warehouse. The data warehouse indicates which pieces in the mixing bowl have business value, such as by highlighting the customers to whom the company should be paying extra attention.

Ask yourself... What is the business value to extending your current application suites with new data sources (like social media) with analytics to discover interesting patterns? Could we identify the important patterns with past customer behavior in the data warehouse?

Recommendations

For executives, this discussion suggests the following to assimilate the cloud mindset of "agile and quick" into their corporate culture.

Be Aware

It is easy for executives to dismiss discussions about cloud technology as not applicable or even nonsense for your company. Cloud solutions, such as Teradata Cloud, are providing a spectrum of alternatives to support enterprise IT in ways that were impossible until recently. As the companies described here illustrate, it is time to be serious about cloud technology and its implications for your company. One should pay attention to cloud innovations, learn about cloud technology, and investigate cloud solutions relevant for your company. It is likely that cloud solutions can enable your business to create and deliver products and services in ways unimaginable by your competitors.

As with any new technology, you should be cautious about its adoption. There is sufficient documentation about high-visibility corporations making huge commitments to cloud solutions with both positive and negative results.

Understand what is working or not in similar industries. Ask questions of your colleagues. Assign internal staff or external consultants to monitor developments. Do not be blind-sided by some startup that uses cloud technology to flip your business economics, as Uber has done in the transportation industry. Be aware, and acquire (or imitate) these startups early in their development.

Be Agile and Reliable

An executive should challenge the IT group to be both agile and reliable. In other words, your legacy systems must continue to be reliable while at the same time becoming more agile in responding to new business opportunities and threats. Both are necessary to your future success. The global business climate is demanding companies be more agile and flexible, pressuring IT to be likewise. Cloud solutions are a viable approach to ease this transition for corporate IT.

Change Mindsets

Do not, however, blindly equate cloud (or any) technology as a surefire solution for business agility or IT revitalization. Think deeply about widely held assumptions about your business and about its IT infrastructure. The barrier to business innovation is often not the technology but a corporate mindset constrained by long-held assumptions whose relevance has faded.

Test the Waters

The best way to change mindsets is for you and your staff to have direct hands-on experience with cloud solutions. The good news is that there are numerous ways of testing the cloud waters. You can mitigate the risks and minimize long-term commitments. Regardless of whether your company has a large mature IT infrastructure or very little, expand your repertoire of alternatives for cloud architectures so that your company can maximize its ability to choose and deploy IT solutions quickly and effectively.

Ponder Data Warehousing

There are three decades of history that have matured the technology and, more importantly, proven the business value of data warehousing. Then, understand the difference between having a data warehouse and having a corporate strategy for data warehousing. The former is a thing, and the latter is a mindset, which is more important in the long term. Formalize this strategy and make it an imperative for your IT group. Later, when you are considering cloud solutions, use this strategy to drive your efforts.

Add Smarts to Your Business

The way that you operated your business twenty years ago is archaic, as judged by the expectations of today's current customers. Over those decades, your company has steadily improved its products and services, utilizing the best practices and technology available. Business analytics have accelerated this evolution, manyfold, toward smarter and smarter business practices.

The good news is that advances in cloud services are allowing simpler and economic ways of managing crazy business growth, reducing the limits in IT infrastructure, and revitalizing IT architectures. Become well informed about cloud architectures, and mold the relevant aspects into your corporate culture.

About the Methodology

The methodology for this study was to listen carefully to pioneering companies in big data analytics and to report accurately on their perceptions. The intent is to contribute to professional education—to share the experiences and best practices with other IT professionals so that we can mature as an industry, amid escalating business challenges and rapidly evolving technology.

The primary author is Richard Hackathorn of Bolder Technology, who appreciates the insights shared by a spectrum of IT professionals. Dan Graham of Teradata deserves special credit for his constructive criticism that resulted in substantive improvements to this study.

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About Bolder Technology

Bolder Technology Inc. is a twenty-year-old consultancy focused on business intelligence and data warehousing. The founder and president is Dr. Richard Hackathorn, who has more than thirty years of experience in the Information Technology industry as a well-known industry analyst, technology innovator, and international educator. He has pioneered many innovations in database management, decision support, client/server computing, database connectivity, and data warehousing.

Richard was a member of Codd & Date Associates and Database Associates, early pioneers in relational database management systems. In 1982, he founded MicroDecisionware Inc. (MDI), one of the first vendors of database connectivity products, growing the company to 180 employees. Sybase, now part of SAP, acquired MDI in 1994. He is a member of the Boulder BI Brain Trust (BBBT). He has written three books and has taught at the Wharton School and the University of Colorado. He received his degrees from the California Institute of Technology and the University of California, Irvine.

About Our Sponsors

Teradata helps companies get more value from data than any other company. Our big data analytic solutions, integrated marketing applications, and team of experts can help your company gain a sustainable competitive advantage with data.

Endnotes

1. NIST Definition of Cloud Computing, Publication 800-145, September 2011. Figure from WikiMedia Commons as File:Cloud computing layers.png dated May 25, 2015.
2. **http://www.teradata.com/cloud**

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