

# Cloud Strategies for Operational Excellence in Retail

## A Practical Approach for a Hybrid Cloud

ORACLE ENTERPRISE ARCHITECTURE WHITE PAPER | MAY 2015





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## Executive Summary

Today's retail consumers demand rich, customized content and seamless cross-channel experiences. They want to start a transaction on their home computer, pick it up from their smart-phone, and complete it in a brick-and-mortar store. They respond to customized marketing campaigns and expect customer support to know their questions before they are asked.

Consequently, retailers are forced to increase business capabilities and to mature technology at an astounding pace, a task made difficult when mired in corporate politics, managing hundreds or thousands of brick-and-mortar stores, and dealing with back-office functions stuck on legacy platform.



Figure 1: Cloud Promises

The stakes are incredibly high; those that survive and thrive will be those that are best able to focus on business innovation supported by agile yet robust IT systems. Moreover, IT must be a strategic partner to business in driving product innovation and agility. The cloud, if done right, can play a big role in making this a reality.

Unfortunately, many retailers have found that their cloud investments have fallen far short of expectations. Perhaps one area was simplified but at the cost of added complexity in another area. Worse, retailers have found that functions moved to early public cloud vendors are now stuck on proprietary systems devoid of industry standards and with no defined processes to bring those functions back on premise. Moreover, dealing with security concerns and back-office integration for point cloud investments makes for big headaches.

The key to realizing the full potential benefits of cloud for retailers is to embrace a *hybrid cloud model* from the beginning as part of a comprehensive cloud strategy and roadmap. Hybrid cloud is a model for extending on-premises business capabilities to the public cloud (the cloud vendor manages the IT), working incrementally towards agility and bypassing the hurdle of maturing your traditional on-premises architecture. A hybrid cloud architecture accepts the reality that select applications and functions, because of security concerns or a need for customization, will always reside in on-premises systems while commodity functions and advanced capabilities such as Mobile, Big Data, and Internet-of-Things are quickly brought to life in the Public Cloud.

Of course, implementation of a hybrid cloud is not without challenges. This paper will help retailers to navigate these challenges and to leverage Oracle's Enterprise Architecture framework and methodology to define a hybrid cloud architecture that works for the retail industry.

## Key Imperatives in Retail

The retail industry is in the midst of a massive storm causing major disruption. To weather this storm, retail executives must proactively drive and lead change initiatives focused on the following key imperatives.

### Get a 360-Degree View of the Customer, or Your Competition Will

Many industries require a 360-degree view of customers in order to compete. This is especially true for the retail industry where competition for customers is fierce and loyalty is easily swayed. Moreover, as online consumer insights have evolved over the last decade, traffic in brick-and-mortar stores has decreased significantly; retailers today cannot afford to let their competition know more about their shoppers and customers than they do.



Figure 2: Key Imperatives in Retail

### Omni-Channel Experience - and Beyond

Retailers must succeed in creating a seamless Omni-Channel experience for their customers. Large portions of retail sales are still finalized in physical stores; customer touch-points, any of which can make or break the customer experience, are numerous. A seamless experience requires consistency across in-store, online, phone, desktop devices, laptops, and handheld devices (including apps). That, in turn, requires integration across Customer Service, Pricing, Inventory Management and Supply Chain Management.

### Customer Acquisition through Customer Experience – Including Social

With so much buzz these days about new CMO imperatives like Customer Experience, a big challenge facing retailers is how to drive traffic to their websites and stores. At a macro level, store-based retail sales are not growing – virtually all growth in consumer spending is being captured by e-commerce. Therefore, evolving the store's role and function is critical as a means to add value to the consumer.

Customer acquisition through positive customer experience (CX) is crucial. In addition, the importance of Social Media is increasing rapidly. Millennials' constant connectivity and dependence on social media means that they trust their friends and social networks. However, when it comes to making purchasing decisions, they rely on strangers even more. Retailers can use insights like these to make targeted investments that drive traffic to their websites and stores. In addition, they can increase conversion of “browsers” or “lookers” into customers.

## Evolution of the Retail Enterprise

In the '80s, technology innovation meant that retailers focused on building out Supply Chain and Warehouse Management capabilities. Goals included: inventory management; maintenance of detailed purchase and distribution records; and streamlined warehouse administration.

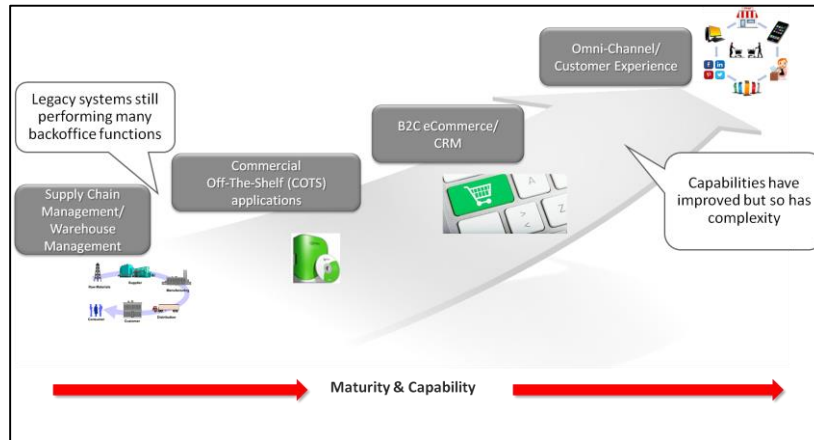


Figure 3: Evolution of the Retail Enterprise

Rapid innovation over the subsequent decade combined with Y2K fears saw retailers streamline processes, adopt COTS and open systems, and embrace Customer Relationship Management. As a result, Customer Experience, E-commerce (B2B and B2C) and digital marketing ideas were seeded and took root over the next few years. Brick-and-mortar retailers were challenged by online startups, many of which turned business models upside down. Retailers raced to compete and protect revenue through E-commerce initiatives. Those that did not or could not, failed to survive.

Of course, evolution did not stop, there. Over the last decade, large-scale consumer adoption of smart-phones and social media led startup-minded retailers to offer rich content in seamless cross-channel consumer experiences. Today's consumers now demand these capabilities and, once again, retailers must race to compete in order to survive and thrive.

Retailers are forced to increase business capabilities and technology maturity at an astounding pace. Unfortunately, many find this exceedingly difficult because they are hamstrung by complexities in back-office functions and are forced to deal with legacy structures and corporate politics while still running hundreds or even thousands of brick-and-mortar stores.

## Why Cloud Deserves a Closer Look

Cloud offers potential for rapid adoption of key business capabilities while greatly simplifying operations. Ultimately, this results in significantly increased agility, allowing focus on key business imperatives.

### How can the Cloud transform today's retail organization?

**Adaptability** – Businesses can scale to meet their changing business and computing requirements. In today's retail economy, this flexibility is a significant feature for LOB managers. Correspondingly, retailers can align their technology expenditures to meet the organization's tactical needs. Retail organizations no longer have to build computing capacity for the future, or be constrained by decisions made or contracts signed in the past. This is key to rolling out capabilities such as Omni-Channel Experience, Digital Customer Data Management, etc.

**Security** – Many retail IT departments struggle with rogue non-IT employee behavior. As an example, consider a set of servers sitting in an insecure "server room" or closet in a remote location. Such issues seem to proliferate across many retailers – large and small. In addition, some spectacular data breaches at large retailers have put this issue front and center in corporate boardrooms. In many instances, these breaches were enabled by insecure devices of suppliers connected to the retailer's network. While these retail organizations had secured their own networks and devices, they had been unable to enforce the same rigor on to their suppliers.

**IT Cost and Simplicity** – Using cloud technology reduces many hidden costs and fees. No more servers, software, and maintenance fees. Many of the costs typically associated with software implementation and updates, customization/extension, hardware and training are bundled into a simple subscription fee that retailers can account for under operating expenses. Moreover, the back-office complexities can be moved to the Cloud simplifying operations, retiring legacy systems, and avoiding costly upgrades and customizations. This all results in operations that are much more nimble.



Figure 4 Benefits of Cloud to Retail Organizations

**Hardware Infrastructure** – Organizations have to spend a lot of budget on human capital required to manage IT infrastructure. With cloud computing, retail IT can instead focus on how IT solutions will help business to deliver against the organizational mission; the infrastructure and software pieces belong to someone else.

**Open & Standards Based** – Internet standards and web services allow retail organizations to connect services to each other. This means that companies can centralize their information and access it from anywhere in the world, on any computer or mobile device, at any time. This is key for enablement of a 360-degree customer view and for taking on challenges such as Mobile and social that requires robust integration and data management capabilities.

## Challenges in Cloud Implementations

The latest innovations in cloud computing are making retail applications even more mobile and collaborative. Still, with cloud models and implementations constantly evolving, a smooth transition for the retail industry entails a thorough understanding of the benefits as well as challenges involved. Like any new technology, the adoption of cloud computing is not free from issues. Some of the most important challenges are as follows.

### Security and Privacy

One of the challenges to cloud computing is how security and privacy will be handled. The fact that valuable enterprise data will reside outside the corporate firewall raises serious concerns - especially in some industries such as Finance and Healthcare – but also Retail. This is one of the reasons organizations may be compelled to keep part of the data in-house or on a private cloud.

### Service Delivery and Billing

It is sometimes difficult to assess the costs involved due to the on-demand nature of Cloud services. Budgeting and assessment of the cost could be very difficult unless the provider has comparable benchmarks to offer. The service-level agreements (SLAs) of the provider are not adequate to guarantee the availability and scalability retailers need. Businesses will be reluctant to switch to cloud without a strong service quality guarantee.

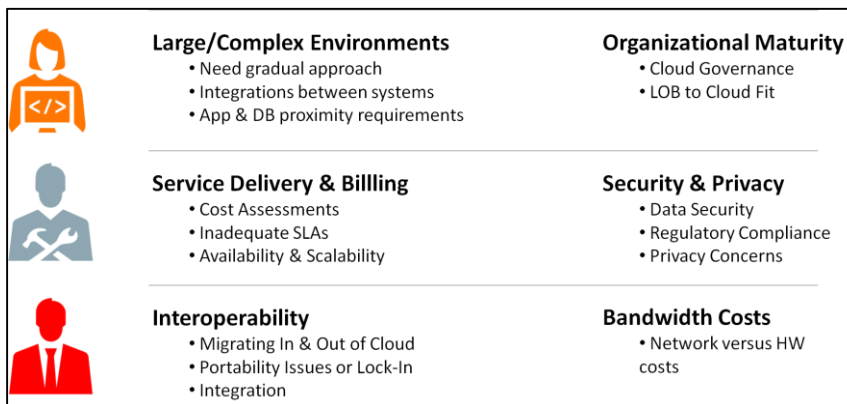


Figure 5: Challenges to Adopt Cloud

### Interoperability and Portability

Retail organizations should have the leverage of migrating in and out of the cloud and switching providers whenever they want, and there should be no lock-in period. Cloud computing services should have the capability to integrate smoothly with the on-premises retail IT.


### Reliability and Availability

Cloud providers still lack round-the-clock service; this results in frequent outages. It is important to monitor the service being provided using internal or third-party tools. It is vital to have plans to supervise usage, SLAs, performance, robustness, and business dependency of these services.

### Performance and Bandwidth Cost

Businesses can save money on hardware but they have to spend more for the bandwidth. This can be a low cost for smaller applications but can be significantly high for the data-intensive applications. Delivering intensive and





complex data over the network requires sufficient bandwidth. Because of this, many businesses are waiting for a reduced cost before switching to the cloud.

### **Cloud Maturity**

Cloud providers are still maturing and rolling out services at a brisk pace. While some services have substantially matured, others have a ways to go. Organizations may find that some functions or LOBs are very well suited to public cloud while others need to keep systems and data in-house due to security, performance or maturity concerns. Such in-house systems might best be suited for private cloud implementations.

## Hybrid Cloud for the Retail Hybrid Enterprise

Retail enterprises are constantly seeking to optimize how physical stores and e-Commerce work together. With the rapid growth of online sales, many have predicted the decline or end of the traditional store model. Does this mean retailers should close shop and focus all their energies to e-Commerce? Not yet. Instead, many retailers are retooling their strategies to bring together the advantages of their brick-and-mortar business and the online shopping experience – in other words, Retail Hybrid Enterprise. Customers appreciate the convenience and speed of online shopping. On the other hand, they still like talking in person to a salesperson and they still want to *kick the tires* for potential purchases, especially for big ticket items. The advantages of one model are the shortcomings of the other. Consequently, many retailers with an existing base of physical stores are rolling out true Buy Online & Pick-Up in Store (BOPUS).

Similarly, in the world of IT, Hybrid Cloud pulls together the advantages of private cloud and public cloud models for the Retail Hybrid Enterprise. The IT world largely recognizes IT Maturity by stages where an enterprise moves from Stage 1: application silos & fragmented data; to standardizing applications and infrastructure; to rationalizing applications and consolidating global data; to finally achieving business modularity via shared services, multi-tenancy, etc.. However, with heavy pressure on retail businesses to enable new business capabilities in a highly competitive world, retailers may not be able to afford a long wait for IT maturity.



Figure 6: Rapid IT Maturity Model

Apart from technology, scores of retail organizations are struggling to implement new systems due to limited IT skill sets and rigid change management processes. This is the prime reason organizations should take a closer look at Hybrid Cloud. A hybrid cloud strategy will help to enable new capabilities quickly while at the same time allowing for protection and preservation of core data and applications, on-premises. With new and innovative public cloud services built on the latest technology and architecture, maturity is instantly enhanced and integration with on-premises applications and data is made straight-forward. Consider one or more of the following hybrid cloud patterns to deliver new capabilities to stakeholders.

### Implement New Capability in OPC

With the *new capability* pattern, retailers can quickly enable capabilities such as Omni-Channel in the public cloud - while integrating those capabilities to on-premises (or private cloud) systems, supporting back-office functions like merchandising systems, supply chain or inventory systems. By using selective public cloud offerings, retailers can create a seamless Omni-Channel experience

across various channels. As an example, Oracle Public Cloud provides customer experience management capabilities like sales, service, e-commerce and marketing in a Software-as-a-Service (SaaS) model. Also, customers can enable mobile capabilities on Platform-as-a-Service (PaaS). Traditionally, these capabilities are hard to enable on-premises, especially if a retail organization is at the lower end of IT maturity curve.

### Extend Existing Capability to OPC

With the *capability extension* pattern, an existing capability is extended with functionality hosted in the public cloud. For example, a retailer seeking to extend existing on-premises sales and marketing capabilities to include a cross-channel-enabled digital marketing experience, could do so using Oracle Marketing cloud. The Oracle Marketing Cloud will help to create consistent and personalized experiences, messages, and promotions across web, social, mobile, email or any other digital channel.

### Move Dev/Test to OPC

The *dev/test* pattern involves moving Dev/Test to public cloud while production systems stay in an on-premises or private cloud model. Often, retail organizations face hurdles in providing modern infrastructure to support the latest development innovations. For such customers, it makes sense to use public cloud Platform-as-a-Service (PaaS) offerings to quickly provision infrastructure for Dev and Test. Once successful testing is completed, applications can then be deployed on on-premises production environments. Oracle public cloud PaaS services include: Database as a Service, Java as a Service, and Integration as a Service, among others.

### Innovate in OPC (achieve Revolutionary Agility)

The *Innovation* Pattern leverages public cloud to enable rapid innovation. This pattern is ideal for cases in which there is significant perceived value in a new innovative technology (e.g., Big Data; Internet of Things) but for which significant investment is not yet warranted. In these cases, public cloud offers rapid deployment and evaluation of such new technologies as a pre-cursor to significant investment. A great example in the retail industry is a proof-of-concept for a 360-degree view of the customer; in the public cloud, traditional structured customer data can be joined with unstructured data from web, social and mobile sources to enabling deep customer analytics.

Regardless of the hybrid cloud options under consideration, the following architecture concerns should be taken into account.

- Data Location, Volume, and Security – Demands for where data can reside, the volume of data to transfer, and security requirements will influence design choices
- Performance Requirements – Application and data transfer performance requirements will influence what can be moved into the public cloud and what will remain at private cloud or on-premises
- Competitive Differentiation – Intellectual property key to a business should be hosted on-premises.
- Seasonal Workload Demand – Seasonal workload demand that traditionally require excess capacity investments may best be deployed on public cloud resources that are built for rapid elasticity.
- Quality of Cloud Partners – Partners need to meet required SLAs for performance and uptime.



## Hybrid Cloud is Enabling Transformation at a Large Retailer

### *Play Offense and Defense with Hybrid Cloud*

As discussed, there are a number of challenges to be addressed if one is to realize the full potential benefits of Cloud. Understanding how to navigate these challenges and meet the demands of a specific retailer requires a robust cloud strategy and an actionable roadmap. In the below example, the Oracle Enterprise Architecture Framework (OEAF) and Oracle Enterprise Architecture Process (OEAP) were leveraged to assist such an effort.

### **Large Retail Company**

This is a case study of one of the USA's largest retailer who are in process of transforming their business to achieve innovation and business agility. This retailer operating over 1000 stores nationwide and they also has a large online presence (B2C E-Commerce). With 100,000+ employees, the organization primarily sells apparel and associated accessories.

### **Business Context**

Like any large retailer with hundreds of brick-and-mortar retail stores throughout the country, this retail company has been embracing innovation and change at a rapid rate. Sales were declining and there was significant focus on improvement of margin and reduction of operational costs. Additional emphasis was placed on better customer experience and, in particular, a seamless omni-channel experience that would cut across existing disparate channels. This retailer had little control over inventory and supply chain processes and, as a result, was struggling in planning and budgeting as well as pricing and promotion management. Additionally, there was no social interaction strategy so they were unable to neither communicate with nor collect feedback from mobile customers. Finally, while this company's marketing and E-Commerce organizations were rapidly rolling out capabilities in online, CX and mobile capabilities – geared towards their Omni-Channel Strategy – IT had been tasked with simplifying back office functions, cutting costs and simplifying operations, working closely with administrative functions.

### **IT Current State**

From the technology perspective, enablement of new business capabilities was a big challenge. Current state of architecture was heterogeneous with numerous applications and hardware and software from various vendors. A number of applications had duplicate capabilities and were capturing duplicate data. Some capabilities had been deployed on modern and innovative software, but most were on older, legacy systems with niche functionality and silos of historical data. Additionally, a number of COTS application were heavily customized resulting in non-standard business processes and in non-standard data models leading to poor data quality and difficult data integration. Numerous previous attempts to standardize and maintain data were ultimately abandoned as initiatives became too burdensome.

The Oracle Enterprise Architecture Team worked with key stakeholders running retail and store operations; the team discovered that there was an enormous business need for analytics. However, reporting initiatives were getting bogged down in data integration resulting in creation of large reports with hundreds of columns but small in terms of delivering business insight. Thus, key LOBs lacked true customer and administrative insight and were thus falling behind the competition.

## Vision

Over several strategy discussions facilitated by an Oracle Enterprise Architect, executive leadership identified several business drivers that were needed to advance corporate goals. A sampling of these business drivers is paraphrased below:

- Improve Marketing Program Execution
- Improve Profitability Through Operating Cost Reductions and Adopting Simplicity in Backoffice Functions
- Optimize HR Processes in North America and Enable Consistency
- Agile Omni-Channel Execution & Streamline Preparation for Peak Periods

Based on the above business goals and in collaboration with executive leadership, the Oracle EA Team created the retail architecture vision shown below.

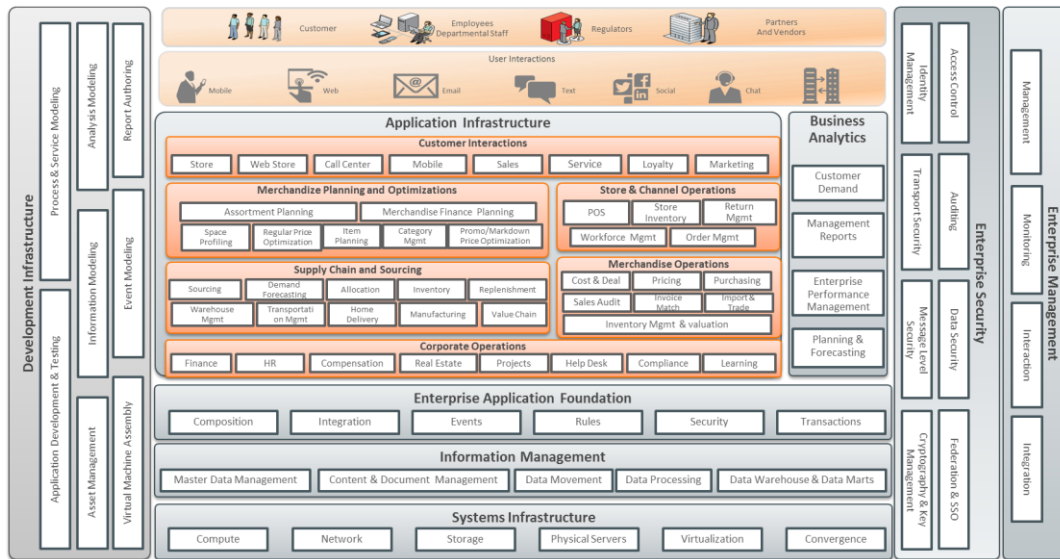


Figure 7: Retail Architecture Vision

Following are key aspects of the above architecture vision.

- Various users and stakeholders are accessing channels to access core retail business capabilities via user interaction layer. These channels should provide consistent user experience and information across various retail processes.
- Business reporting and intelligence will be provided via Business Analytics capabilities. Business Analytics should provide role based dashboards to access various reports which can also be accessed from other directed channels. Also, management should be able to use analytics for planning and forecasting.
- Business capabilities are provided via various applications
- Unified information architecture allows collection of data from various sources and provides for data cleansing, data analysis and a single point-of-access for data across all the channels. Data should be collected once and re-use across various processes. There should be a unified and high-level semantic business data model that organizes all types of information and their relationships to each other across the

business which is known as Single source of truth for key data. Information is provisioned and delivered through Enterprise Application Foundation capabilities.

- At the bottom of vision, all this runs on system infrastructure which provides compute and storage for applications. Entire architecture from user interaction to systems infrastructure must allow for data protection whether data is in motion or at rest.
- On the right hand side, key security capabilities are identified as well as the set of capabilities needed to manage, govern and monitor through a single dashboard.

### Future State

With the vision defined, the next step was to align an IT solution. The Oracle Team took the above defined vision and aligned with potential products as illustrated in the following figure. Additionally, an inventory of current solutions/applications was established, noting for each whether modernization, retirement, or consolidation was appropriate.

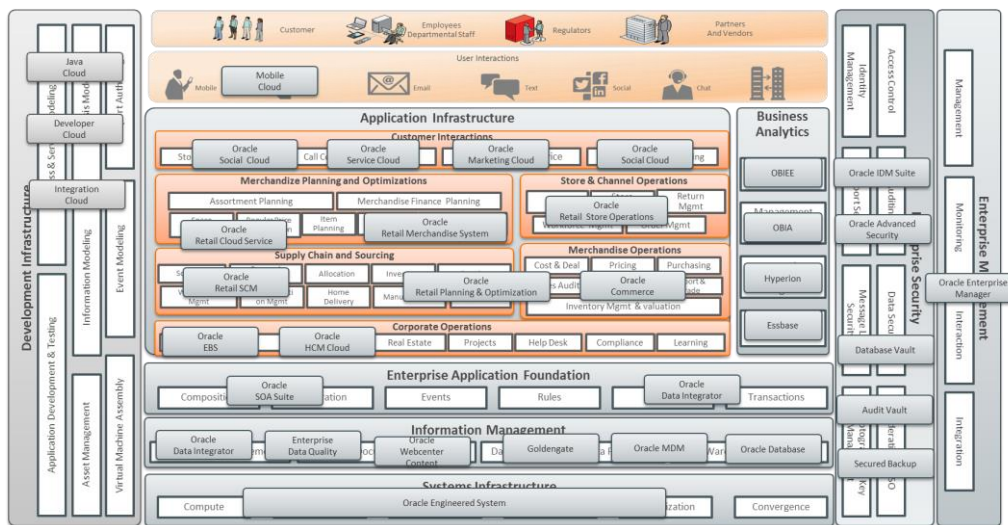


Figure 8: Retail Architecture Vision to Product Mapping

During discovery sessions, it was readily apparent to key LOB and IT stakeholders that current environment complexity, legacy processes, and stretched business and IT resources would bog down the transformation. As they started exploring options and opportunities, promise of cloud innovation and its benefits were enticing. However, stakeholders struggled with many of the same *challenges* discussed in this document. As an example, stakeholders wanted control over HR data but wanted to avoid complexity of hosting and implementing HR in-house. Similarly, stakeholders needed to get off a “burning platform” for marketing and instead explore innovation from nimble Public Cloud providers while ensuring integration to their on-premises systems and processes. Finally, there was an urgent need to streamline and simplify IT infrastructure – and while benefits of a private cloud were apparent – they didn’t have the wherewithal to architect and operationalize a private cloud.

Ultimately, a hybrid cloud architecture was needed that could balance aggressive pursuit of some initiatives (offense) while acting more conservatively in other areas (defense). Oracle Enterprise Architects worked in collaboration with key stakeholders to determine specifics. The resulting hybrid cloud architecture is depicted, below.

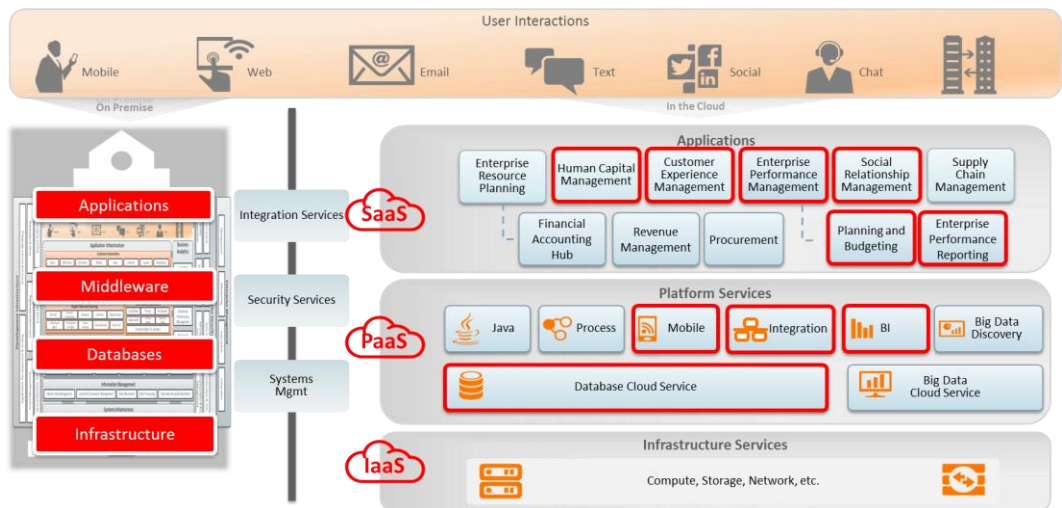


Figure 9: Hybrid Cloud Architecture

Following are key aspects of the above hybrid cloud architecture.

- Play offense by aggressively pursuing Sales, Marketing and Omni-Channel initiatives to grow revenues, market share and share of wallet.
- Play defense by reducing complexity in back office functions such as HR and IT, thus reducing overhead and cutting costs.

Beyond the essential Hybrid Cloud Architecture depicted above, additional focus was given to integration and security, two key aspects of a hybrid cloud architecture. Note the below figures that give high-level architecture models.

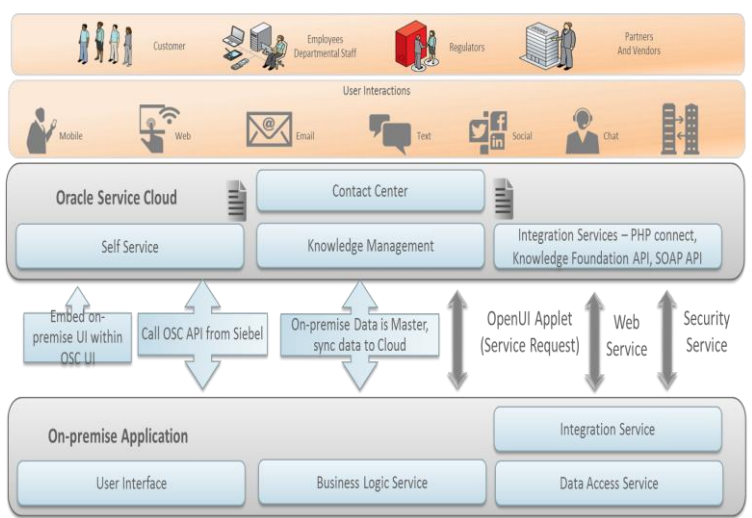


Figure 10: Hybrid Cloud Integration Model

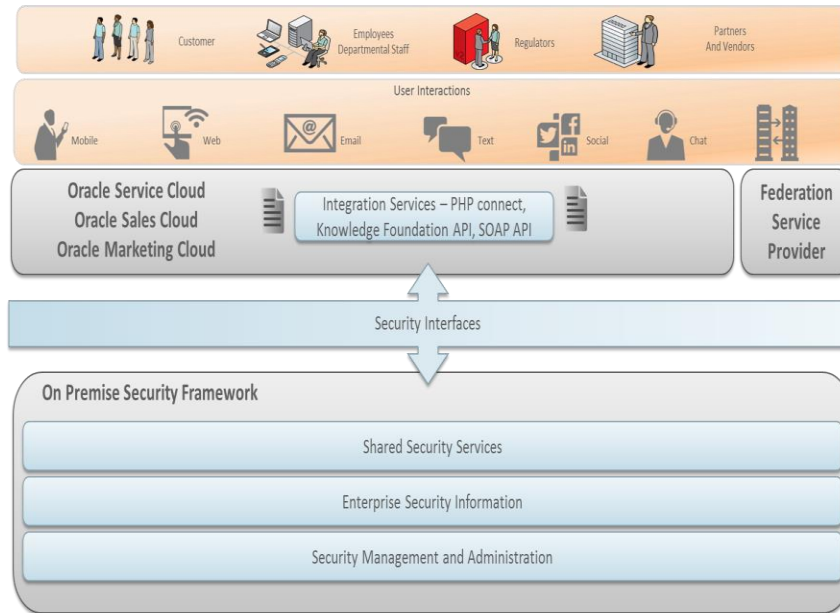
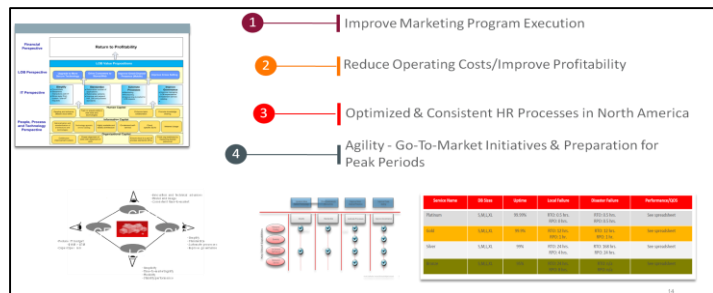


Figure 11: Hybrid Cloud Security Model

## Roadmap

A phased, step-by-step approach was created to streamline the journey to the Cloud for this retailer. This approach is depicted in the figure below. Key elements of this phased approach are elaborated below, as well.

- Marketing Roadmap:** The Marketing Team had an immediate need for a stable environment to run triggers and events as their existing platform had ongoing problems. Oracle recommended migrating to Responsys in Oracle's Marketing Cloud. This would allow for not only immediate access to Oracle's innovative marketing tools in Oracle Public Cloud but also allow focus on marketing strategies – both short term and long term – instead of IT infrastructure planning, setup and maintenance. It would also take away the tactical headache of managing an unwieldy platform. Additional functionality such as running campaigns, marketing orchestration and cross-channel marketing would be added in phases.



- Omni-Channel Roadmap:** There was a need to rollout innovation at a rapid rate towards the company's goal of achieving its Omni-Channel Strategy. Several initiatives including upgrade and enhancements to its dot-com website, accurate SKU and inventory display, personalization, customer data management, etc.



needed to be executed with tight time lines while ensuring intermediate peak periods were not disrupted. Oracle recommended use of Platform-as-a-Service including Database-as-a-Service and Middleware-as-a-Service in a public and private cloud model to achieve this goal. As part of this effort, the customer would immediately deploy sandbox, development and test environments in Oracle's Public Cloud. Based on workload characteristics, integration requirements, etc., a decision would be made on whether production environments would be deployed in the public cloud or in the private cloud. This work was done in conjunction with the IT Cloud Infrastructure Roadmap and served as input to that roadmap.

- **HR Roadmap:** As mentioned earlier, there was a strong need to optimize HR processes and procedures and streamline payroll. The current HR platform was getting outdated and it was difficult to leverage functionality that HR needed to be effective. An additional constraint was that HR data needed to be owned by the customer in a private non-shared environment. Oracle recommended implementing HR in green-field managed cloud environment. Data integration would be accomplished using Golden Gate Data Service to allow for HR analytics to be run out of on-premises Oracle Business Intelligence Enterprise Edition (OBIEE) environment.
- **IT Cloud Infrastructure Roadmap:** Enabling agility of Omni-Channel strategy and simplifying operations were key objectives of the IT Infrastructure Cloud initiative. Based on detailed discussion with key IT staff, Oracle EA helped put together a solution architecture with agreements to focus on DBaaS initially. Based on existing SLAs and future requirements, a detailed Service Catalog was created and socialized. This Service Catalog served as the foundation for future cloud discussions and design. While initial discussions focused on DBaaS, the team quickly realized value of using it for Java-as-a-Service. On-prem and public cloud DBaaS and WLaaS were part of the design for the Logical Architecture. Upon execution of a quick proof of concept; the team is now ready for actual implementation of Dev/Test systems in public cloud and actively considering migration of some systems to private cloud.

### Change Management and Governance

Finally, as with any significant transformational effort, change management and governance are key success factors. Cloud implementation failures can often be traced to a simple misunderstanding of who is responsible to manage change. With Hybrid cloud it is even more critical to define the *right* change management strategy as now you are spanning your processes across two data centers. For this particular case study, an Oracle Enterprise Architect worked with stakeholders to elaborate detail for the four key areas illustrated in Figure 12. This provided a strong start in detailed planning for this large retail customer, providing for rapid transformation focused on new business capabilities and providing for rapid maturity of IT architecture.

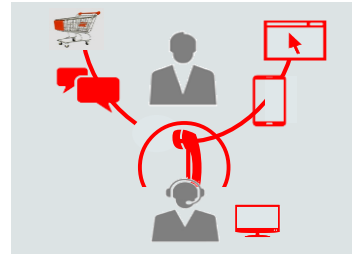


Figure 12: Change Management Areas

## Final Thoughts

Retail organizations face immense competitive pressure and constantly increasing expectations from consumers. To survive and thrive, retailers must offload IT complexity where possible and leverage new and innovative technologies quickly while ensuring existing operations run smoothly. Hybrid Cloud can help to achieve these goals and can be a key competitive distinguisher. However, this approach is not without its risks and challenges. Without the right strategy and roadmap, retail organizations may end up with new complexities and new application and data silos that actually serve to decrease agility and stifle business innovation.

Oracle's proven Enterprise Architecture Methodology for the cloud is already helping many customers take advantage of cloud innovations. Specifically, the hybrid cloud approach of using SaaS and PaaS in the public cloud and PaaS in private cloud is a game-changer. Retail organizations would do well to explore this opportunity to address their key customer and back-office imperatives.





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Oracle Enterprise Architecture Whitepaper – Cloud Strategies for Operational Excellence in Retail

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