Customer Experience Reference Architecture

Today’s Winners Are Defined by Customer Experience
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Executive Overview

Customers want a consistent, connected, personalized, and efficient experience throughout all phases of the customer lifecycle delivered seamlessly across all touch points. Exceptional customer experiences drive revenue and create loyalty, advocacy, and repeat business. The prevalence of social media today means that customer satisfaction may not only impact repeat business from that person, but frequently also impacts new or repeat business from their social media circle. Therefore, the customer experience is more important than ever.

Great customer experience is the sum of all interactions and experience throughout the customer lifecycle. Achieving great customer experience requires a complete, robust customer experience solution that delivers consistent information and functionality across all points of interaction throughout the entire customer lifecycle. This paper describes a reference architecture for just such a customer experience solution.

Figure 1 illustrates two important concepts for customer experience. First, the customer experience is a continuing process, not a one-and-done event. Second, there is the customer perspective (out-side-in perspective) and the company perspective (inside-out perspective). Figure 1 focuses on the customer perspective but introduces the company perspective (Market & Sell and Support & Serve). This distinction between customer and company perspectives is an important consideration for the reference architecture.

The reference architecture is described in a product neutral way so that customers can understand how to combine Oracle products with existing or legacy applications to create a complete, end-to-end solution that best meets their needs. Oracle products offer the best and most complete customer experience solution available on premise, in the cloud, or a combination thereof.
Introduction

In today’s connected world, the customer experience spans multiple different touch points throughout the customer lifecycle. Figure 2 illustrates an example of how a customer could move through multiple different touch points during the buying process.

It should be noted that the customer lifecycle terms used in Figure 2 (and around the infinity loop in Figure 1) are illustrative, not definitive, since different terms would be used for specific industries. For example, in the financial industry the term ‘purchase’ would be replaced with ‘apply’ when the product is a loan or account.

The challenge that many companies face is that the IT systems that support the business have been acquired or built piecemeal over time resulting in silos of information and functionality that, from the customer’s perspective, results in a fragmented customer experience. Additionally the explosive growth of social media has left companies scrambling to effectively leverage the opportunities and information from this new point of customer interaction.

The solution is to address customer experience holistically from both the business and IT perspective. This requires that the business and IT work collaboratively to acquire, build, and integrate the systems needed to support a truly cross-channel customer experience solution. This paper describes the architecture of a cross-channel customer experience solution by presenting several different architectural views of the solution.

Reference Architecture Conceptual View

The conceptual view for the reference architecture (Figure 3) uses business terms to provide a high-level description of the customer experience solution.
At the top of the illustration is support for the different channels that a company uses to conduct business with customers. Ubiquitous integration with social networks is also an important capability for modern customer experience solutions.

Business Functions

At this level of detail, customer experience consists of three primary business functions: Commerce, Marketing & Loyalty, and Support & Service. Each of these business functions is further detailed below.

It should be noted that although the customer experience reference architecture is organized into these three functional areas, the solution cannot be implemented as silos of functionality. Rather, the functionality must be available wherever needed throughout the customer experience lifecycle.

Commerce

Commerce focuses on selling a product or service to a customer. At a high level this includes:

- **Search / Browse** - The customer must be able to readily find the products of interest either by searching the product catalogue or via browsing of the catalogue. Great customer experience requires guided search and navigation to help customers rapidly find the right product(s) of interest.
- **Offer / Recommend** – Providing offers and recommendations greatly improves cross-sell and up-sell. Offers and recommendations must be real-time, personalized, and
relevant to provide a compelling shopping experience. Offers and recommendations should also incorporate business insight to specifically target customers based on past behavior or purchases from other customers with similar interests.

- Order Management – Once the customer has decided on particular products, the ordering process must be efficient and accurate even for complex products that require order orchestration.
- Business Insight – To consistently improve the customer experience, information needs to be collected from all interactions across all point of interaction and made readily available for both historical and near real-time analysis.

Marketing & Loyalty

Marketing & Loyalty drives demand for the company’s products and services and rewards customers for continued business. At a high level this includes:

- Marketing Automation – Rapidly launch targeted marketing campaigns across all channels, align marketing and sales to produce higher quality leads and increased closure rates, and measure the campaign performance and return on investment.
- Community Management – Building a community of customers that provide feedback, recommend products to others, assist new users, etc. The community management must also cover social media outside the direct control of the company.
- Loyalty Management – Integrated loyalty management to encourage and reward customers for their repeat business.
- Channel Optimization – Using the strengths of one channel to overcome the weaknesses in another channel can significantly improve the customer experience. Additionally, promoting less expensive channels (e.g. Web) where appropriate can reduce costs and improve the bottom line.

Support & Service

Support & Service provides help to customers throughout the customer lifecycle including product information, troubleshooting, warranty issues, configuration guidance, etc. At a high level this includes:

- Self Service – Providing comprehensive self service is essential for great customer experience, especially for the do-it-yourself type of customer. Comprehensive self-service also reduces costs since this is the least expensive form of customer support.
- Agent Assist – For some problems, and some types of customers, self service will just not provide the needed help. In these cases, a real, live agent is the only means to provide acceptable service. Agent assist must be available via multiple channels including phone, chat, and email.
• Account Management – Full featured account management is a must to provide acceptable levels of customer support. This functionality needs to be available both via self service and via agent assist.
• Knowledge Management – Collecting, correlating, and organizing product support information can dramatically improve customer service. A knowledge base of product support information should be available to agents as well as customers themselves.

Information

The three primary types of information needed for customer experience are:

• Customer – Customer information should be all encompassing (i.e. 360° view) and customer centric.
• Product – Product information needs to be complete and up-to-date.
• Content – Content provides the supporting material for all of the business functions across all touch points and includes wide variety of formats including documents, images, video, templates, etc.

All of the information included in the customer experience solution must be accurate, consistent, authoritative, and real-time. Stale, batch-propagated information is the bane of successful cross-channel customer experience. Likewise, multiple data storage systems containing overlapping but conflicting information leads to a poor customer experience.

Deployment

There are more options today for where to run a solution than ever before. At a high level the four options for deployment of the customer experience solution are:

• Public Cloud – In the public cloud model, a company rents resources from a third party. The most advanced usage of public cloud is where the business functionality is provided by the cloud provider (i.e., software-as-a-service). Public cloud might also be used as the platform upon which the business functionality is built (i.e., platform-as-a-service), or the public cloud may simply provide the infrastructure for the system (i.e., infrastructure-as-a-service).
• Private Cloud - Private cloud is the same as public cloud, but the cloud is owned by a company instead of being provided by a third party.
• Managed Services – In this model a company owns the components of the system, but outsources some or all aspects of runtime operations.
• Traditional IT – In this model a company owns and operates the system.
These various options for deployment are not mutually exclusive. The customer experience solution might be deployed in two or more different ways. Not only might the functional areas be deployed differently (e.g. Marketing & Loyalty as Managed Services with Support & Service deployed to a Public Cloud), but even a single functional area might span deployment options. For example, the on-line ordering experience might start (search, browse, recommend) with a system hosted in a public cloud but then transition to an internal system (traditional IT) for order management when the customer’s critical information is being handled.

Architecture Principles

In essence architecture principles translate business needs into IT mandates that the solution must meet. Because architecture principles span the entire solution, they are at a much higher-level than functional requirements. Establishing architecture principles drives the overall technical solution. Some key architecture principles for the customer experience solution are provided below.

<table>
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<tr>
<th>Common Business Execution</th>
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<tr>
<td><strong>Statement</strong></td>
</tr>
<tr>
<td><strong>Rational</strong></td>
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</table>
| **Implications** | • Provide an end user experience that is seamless when users switch between touch points.  
• Support common business processes across all touch points.  
• Monitor business processes to identify user behaviour across touch points. |

<table>
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<th>Service-Enabled Back-End Systems</th>
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<tr>
<td><strong>Statement</strong></td>
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<tr>
<td><strong>Rational</strong></td>
</tr>
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| **Implications** | • Decouple back-end systems from channels and business processes.  
• Support a customer-centric mode of operation rather than a product or systems centric mode.  
• Link all systems to a common customer view. |
Multi-Channel Support

<table>
<thead>
<tr>
<th>Statement</th>
<th>Development should not create channel-specific functionality; rather, functionality should be provided via shared services and exposed for each channel.</th>
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<tbody>
<tr>
<td>Rational</td>
<td>Consistent functionality and responsiveness is much easier to maintain if all touch points can be treated uniformly rather than uniquely.</td>
</tr>
<tr>
<td>Implications</td>
<td>• Write once and easily deploy across all channels and devices. • Monitor and manage SLAs and performance in each of the channels. • A common monitoring and management framework is needed.</td>
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Secure All Channels

<table>
<thead>
<tr>
<th>Statement</th>
<th>A comprehensive, integrated, centrally administered security framework is needed.</th>
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<tbody>
<tr>
<td>Rational</td>
<td>Piecemeal security is more difficult to configure and maintain and may leave gaps that can be maliciously exploited.</td>
</tr>
<tr>
<td>Implications</td>
<td>• Provide a centralised identity and access management solution. • Build in fraud detection to understand threats as a whole across all of the channels.</td>
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These are example architecture principles that a company might embrace. Ultimately it is up to each company to define the appropriate architecture principles to ensure that the customer experience solution meets the needs of the business while furthering the strategic direction of IT.

Reference Architecture Logical View

A complete, full-featured customer experience solution must cover all aspects of the customer lifecycle (Figure 1), i.e., the customer perspective. It must also cover the company’s business processes the support the customer lifecycle, i.e., the company perspective. This relationship between the customer perspective and the company perspective is illustrated in the high-level reference architecture shown in Figure 4.
Supporting both the customer perspective and the company perspective is a common set of business services as well as the information used throughout the customer experience. Using a common set of business services and common information model is what provides the seamless customer experience across channels and touch points throughout the customer lifecycle.

Social media is an important touch point between the customer and the company that must be considered as part of the complete customer experience solution, but the social media sites (and underlying systems) are not usually under the company’s direct control. All of the interactions with the customer, whether direct or indirect via social media, should be captured and analyzed to provide near real-time, ongoing business insight.

Subsequent sections in this white paper further detail the logical view of the reference architecture. Each of the three primary business functions from the conceptual view (Figure 3) is shown in greater detail to illustrate and describe the specific capabilities required to fully
support the business function. Once the capabilities have been presented in context of the business functions, the full logical view of the reference architecture is illustrated (Figure 8) and described.

Commerce Components of the Logical Architecture

Figure 5 focuses on the commerce aspects of the customer experience reference architecture.

Central to the architecture is the commerce capabilities that every customer will expect to find on a commerce site accessible from a variety of devices, including laptops, tablets, smartphones, and kiosks. The architecture includes a customer perspective of the functions that the customer uses including the ability to research products or services both via search and browse, the ability to select a product or service, and the ability to purchase the product and/or service and track its delivery. Additionally, the customer may desire live help from a customer agent, again accessed via any appropriate touch point.

Providing a compelling, seamless commerce experience for the customer requires many more back-end capabilities that are transparent to the customer. The interface into the commerce site must provide a complete, modern appearance that is easily navigable and can be customized and personalized for the particular customer or customer segment. As the
customer researches products and services, the site should provide guided navigation and recommendations based on current activities and past purchases by both the individual customer and other similar customers. Once the customer has selected one or more products, the site must provide accurate pricing, including any discounts or coupons. When the customer decides to purchase, a whole new set of capabilities is required to ensure the customer has a positive experience with their purchase - from the billing to the delivery of the purchased products. In the case of complex products, the capabilities required include management of the business process that configures, provisions, and delivers the products or services purchased from the right fulfillment location.

Underlying the commerce solution is the information used throughout the process. Central to the commerce solution is the product information and content used to populate the commerce site. Supporting the customer’s product research may require an extensive knowledge base of product usage, configuration, comparisons, etc. When the customer decides to purchase, accurate inventory for the product must be available in real-time and might include inventory available on-line as well as inventory for physical stores near the customer’s location. And, of course, information about the customer - all aspects of the customer – must be readily available.

Finally, all interactions with the customer need to be collected and made available for analysis to better personalize the experience and identify hidden opportunities. This includes interactions the customer has with social networking sites as well as the direct interaction with the commerce site.

Loyalty and Marketing Components of the Logical Architecture

Figure 6 focuses on the loyalty and marketing aspects of the customer experience reference architecture.
The primary actor in the loyalty and marketing logical architecture is product marketing. The product marketer needs to be able to design and author a consistent, connected, and personalized brand experience across all touch points and devices. With respect to the customer lifecycle, the focus for these components is on the Need and Recommend phases of the customer lifecycle. Marketing is fundamentally about driving need for products and services. The highest form of loyalty is for the customer to recommend both the company and their products/services to others.

In order to respond quickly to customer trends or competition, the marketer needs a full set of business intelligence tools that can be used to analyze data and generate intuitive reports. The underlying data that is used in the analysis comes from a variety of sources including all previous direct interactions with customers across all touch points as well as indirect interactions such as postings on social media sites.

The marketing interaction via social media needs to be two way. Social media should be used to build communities and promote the company’s products and services. Social media sites should also be monitored so that references to the company or the company’s products/services are collected and analyzed as part of a comprehensive approach to social media.

Regardless of the source of data, acting on the business insight gleaned from the data may take a variety of forms that includes product campaigns, issuing coupons, rewarding loyalty,
or community outreach and interaction. For example, the business insight might determine that particular products are likely to be of interest to a specific customer profile in which case a targeted advertising campaign, including specific coupons conducted via print, email, and/or social media sites, could be used to attract customers that fit the profile.

In most companies the product marketing function encompasses a large number of people each focused on specific products, audiences, channels, etc. Therefore, successful end-to-end marketing requires considerable coordination across divisions or individuals within the company.

Ultimately the goal of the loyalty and marketing endeavor is to increase customer acquisition and retention by targeted engagement with customers and potential customers across multiple channels and devices.

Service and Support Components of the Logical Architecture

Figure 7 focuses on the service and support aspects of the customer experience reference architecture. This centers around the activities that a customer may need to accomplish while using or maintaining the product purchased.

Common self-service activities include updating account information (e.g. phone number, address, credit card number), tracking the status of an order, and checking on payments (both past and pending). The customer may also be experiencing a problem with a product. Providing rich self-service capabilities not only increases customer satisfaction, but also
reduces call center costs. Providing a searchable knowledge base of known problems, issues, fixes, and work-arounds can significantly improve the self-service experience. When self service will not suffice, the customer must have access to a customer service representative (e.g. click-to-call, click-to-chat, click-to-email) who has access to all the same information that the customer used during self service activities. For complex product issues, it may also be necessary to open a trouble ticket and track that trouble ticket through multiple steps to resolve the customer problem. Customer service and support also provides the opportunity to up-sell or cross-sell, especially if the customer has a positive service/support experience.

Again all interactions with the customer, both the direct service and support interactions as well as the social network interactions, should be captured for analysis. In the case of service and support, this data can also be used to populate the self-service knowledge base as well as to identify hidden opportunities.

Customer Experience Reference Architecture Logical View

The previous sections described the customer experience reference architecture by focusing on particular areas of functionality that the solution must provide. Of course, the customer experience reference architecture must describe a unified solution covering all necessary functionality across all touch points. Figure 8 illustrates the complete customer experience reference architecture.
The top layer in the diagram shows the various devices and touch points that are supported by the customer experience reference architecture. The Interaction Layer provides the consistent interface across the devices and touch points.

The Business Process Layer includes the business processes provided by the solution from both the customer perspective (red) as well as from the company perspective (grey) all supported by the Business Process Management capability. Likewise the Business Service Layer shows the necessary capabilities from both the customer perspective (red) as well as the company perspective (grey). Underlying the business services is the Data and Service Integration capability that provides the glue that brings all the data and services together into a comprehensive, unified solution.

The Information Layer illustrates the information required to support a consistent, seamless customer experience. Fragmented, silo’ed information cannot yield a compelling customer experience. The bottom layer, Shared Infrastructure, is the compute, network, and storage that supports the entire solution. This might be on-premise, hosted off-premise, private cloud, public cloud, etc.

Finally, but certainly equally important, is the security, monitoring, and management layer that spans the entire customer experience reference architecture. This is another area where a piecemeal, fragmented approach is unacceptable since it will inevitably lead to customer experience issues or inconsistencies resulting in customer dissatisfaction.

Oracle Product Mapping View

This section describes how the logical architecture can be implemented using Oracle products. The relationship between architecture components and products is not intended to reflect a one-to-one mapping since products have multiple features. Products are mapped to the logical component(s) with the greatest affinity. Likewise, components will map to multiple products that support different deployments or unique sets of capabilities. The desired deployment for the customer experience solution may drive certain product selections or eliminate certain products from consideration. For example, Oracle RightNow CX Cloud Service is only available via software-as-a-service public cloud offering.

The list of products presented in this section is not intended to be a comprehensive list of all products available from Oracle that could be applied to customer experience. Rather, they represent a best match to the scope of the architecture that is addressed by the conceptual and logical views. Likewise, not all products listed are required for any particular customer experience solution. The actual products required depends on the individual company’s functional requirements as well as their existing customer experience IT assets.
For more information on Oracle customer experience products, or further information on product features, please consult the Oracle customer experience website or an Oracle product specialist.

**Commerce Product Mapping**

Figure 9 maps the Oracle products onto the commerce components of the logical architecture to illustrate how the capabilities required for commerce can be realized using Oracle products.

![Commerce Product Mapping Diagram](image)

**Social**

**Oracle Social Network** is a secure private network that provides a broad range of social tools designed to capture and preserve information flowing between people, enterprise applications, and business processes. Oracle Social Network provides contextual, real-time communication within and across enterprises.

**Oracle Social Marketing Cloud Service** provides easy to use, scalable, and efficient tools and technology needed to execute social marketing strategies. Oracle Social Marketing Cloud Service enables marketers to publish content, engage fans, and customize a brand’s character.
Oracle Social Engagement and Monitoring Cloud Service provides a single interface to monitor what customers are saying, reply to posts and messages, keep tabs on your competitors, schedule posts, publish to multiple Facebook and Twitter accounts, and converse at scale.

Interface

Oracle WebCenter brings together the most complete portfolio of portal, Web experience management, and collaboration technologies into a single integrated product suite delivering a next-generation user experience.

Oracle ADF Mobile uses a component-based development approach to create rich user interfaces for iOS and Android from a single code base. Build or extend enterprise applications incorporating native device services, built-in security, and connected and disconnected modes.

Commerce

Oracle ATG Commerce boosts business growth by providing personalization, business user control, cross-channel support, and a flexible platform. Advanced features help your customers quickly find desired products, learn about new offerings, comparison shop, register for gifts, preorder products, redeem coupons, and easily complete their purchases.

Oracle Endeca Commerce complements Oracle ATG Commerce by delivering, analyzing, and targeting just the right content to just the right customers to guide navigation, encourage clicks, and drive business results across touch points.

Oracle Recommendations on Demand automates and personalizes online shopping by recommending the products that match each shopper’s current needs and the company’s merchandizing strategies, presenting the recommendations at the right time in the right channel.

Oracle Siebel Quote and Order Capture simplifies the complex and often frustrating process of tracking thousands of products across multiple catalogs and systems. It delivers deep customer insight that enables businesses to dynamically present targeted product bundles, offer intelligent cross-sell and up-sell opportunities, and achieve optimal prices for products and customer segments.

Oracle Retail provides retailers with a complete, open, and integrated suite of business applications, server, and storage solutions engineered to work together. In the context of the commerce logical architecture, Oracle Retail provides inventory management and connects the dots between channels for the purchase capability. For example, if a customer purchases
a product on-line but prefers to pick up the purchased item at a local store, Oracle Retail delivers (among other capabilities) inventory and point-of-sale functionality for the store.

**Oracle E-Business Suite** delivers hundreds of cross-industry capabilities including order capture, financial management, resource planning, and supply chain management. In the context of the commerce logical architecture, Oracle E-Business Suite provides the back-end capabilities that are integrated with the customer facing commerce components.

**Dialog**

**Oracle Click-to-Call Cloud Service** turns a traditional telephony service into a smart interactive voice experience. A powerful targeting engine proactively engages visitors based on their online behavior and intelligently routes them to the best available agent for personalized assistance.

**Insight**

**Oracle Business Intelligence** is a complete, open, and architecturally unified business intelligence solution for the enterprise that delivers best in class capabilities for reporting, ad hoc query and analysis, OLAP, dashboards, and scorecards.

**Oracle Real-time Decisions** combines both rules and predictive analytics to power solutions for real-time enterprise decision management. A high-performance transactional server automatically renders decisions within a business process and reveals insights, creating actionable intelligence from data flowing through the process in real time.

**Oracle Endeca Information Discovery** is an enterprise data discovery platform for advanced, intuitive exploration and analysis of complex and varied data (structured, semi-structured, or unstructured). Data is stored in a faceted data model that dynamically supports changing data allowing an iterative “model-as-you-go” approach.

**Information Management**

**Oracle WebCenter Content** is a unified repository that removes content silos; manages updates to documents, images, and rich media files; and manages the end-to-end content lifecycle from creation to archiving.

**Oracle Master Data Management Suite** consolidates and maintains complete, accurate, and authoritative master data across the enterprise and distributes this master information to all operational and analytical applications as a shared service.

**Oracle Database** delivers industry leading performance, scalability, security, and reliability on a choice of clustered or single-servers. It provides comprehensive features to easily manage
the most demanding transaction processing, business intelligence, and content management applications.

Loyalty and Marketing Product Mapping

Figure 10 maps the Oracle products onto the loyalty and marketing components of the logical architecture to illustrate how the capabilities required for loyalty and marketing can be realized using Oracle products.

Since the reference architecture is for the customer experience solution, it is not surprising that most of the products mapped onto the loyalty and marketing logic architecture are the same products that were mapped onto the commerce logical architecture. The additional Oracle products for this logical architecture deliver the capabilities for loyalty and marketing. Two products, Oracle Real-time Decisions and Oracle Endeca Commerce, included above are also described in this section but in this section the description focuses on the capabilities they provide to the product marketing role.

Loyalty & Marketing

**Oracle Eloqua Marketing Cloud Service** transforms the way a company markets in the digital age by targeting prospects, easily executing campaigns, sending leads to sales in real time, increasing lead quality, and increasing close rates.
**Oracle Siebel Enterprise Marketing** is a comprehensive, closed-loop solution that empowers organizations across industries to achieve excellence in marketing and is tailored to the needs of business and consumer marketers across more than 20 industries.

**Oracle Siebel Loyalty** enables organizations to create loyalty campaigns without the help of IT staff. It delivers a full range of analytics, marketing, and service capabilities that help to better understand each customer's lifetime value and design service levels and promotions that maximize the potential of all each customer relationship.

**Oracle Real-time Decisions** includes a collaborative web-based application that enables business stakeholders to manage the lifecycle of their decision logic from inception to execution.

**Oracle Endeca Commerce** allows business users to guide and influence customers across multiple touch points without having to predict their path, set up scenarios, or engage IT. Integrate with technologies like Web analytics, recommendations, and user reviews to automatically drive elements of the experience including data-driven, dynamic, and static content.

**Service and Support Product Mapping**

Figure 11 maps the Oracle products onto the service and support components of the logical architecture to illustrate how the capabilities required for service and support can be realized using Oracle products.
Most of the products mapped to the service and support capabilities were described above in the commerce product mapping. This section describes the products that are specific to the service and support capabilities.

Service & Support

**Oracle RightNow CX Cloud Service** combines Web, social, and contact center experiences for a unified, cross-channel service solution in the cloud. RightNow’s service enterprise platform provides transparent reliability, unmatched security, and total cloud freedom for mission critical customer experience delivery.

**Oracle Siebel Contact Center and Service** helps businesses deliver quicker, better, and more-efficient customer service. Whether a company needs hosted, mobile, or on-premise solutions, these applications provide optimal resource deployment, speedy issue resolution, one-and-done request handling, warranty management, service scheduling, etc., integrated with powerful tracking and analytics capabilities.

**Oracle Knowledge** offers simple and convenient ways for customers and agents to access knowledge that was once hidden. To understand the true intent of each inquiry it uses techniques such as natural language processing, real-time contextual data, and industry-specific libraries to quickly pinpoint the most-relevant answers.
Infrastructure Product Mapping

The product mapping sections above describe many different Oracle products that can be used to realize the business functionality that is required for a customer experience solution. Additionally, there are infrastructure capabilities included in the reference architecture that provide the foundation for, and unification of, the business capabilities. These essential infrastructure capabilities include: Business Process Management, Data and Service Integration, Security, and Management and Monitoring.

**Figure 12. Infrastructure Product Mapping**

### Business Process Management

**Oracle Business Process Management Suite** simplifies achieving process management success with a complete solution for all types of processes (e.g. system-centric workflow, human-centric workflow) by providing a unified process foundation, user-centric design, and social BPM interaction.

### Data and Service Integration

**Oracle Data Integrator Enterprise Edition** delivers high-performance data movement and transformation among enterprise platforms with its open and integrated Extract, Load and Transform (E-LT) architecture. An easy-to-use interface combined with a rich extensibility framework helps improve productivity and lower development costs.

**Oracle GoldenGate** is a high-performance software application for real-time transactional change data capture, transformation, and delivery, offering log-based bidirectional data replication.

**Oracle Service Bus** is a lightweight Enterprise Service Bus (ESB) specifically designed for the task of integrating, virtualizing, and managing services in a shared services infrastructure.
Oracle Service Bus connects, mediates, and manages interactions between heterogeneous services, legacy applications, packaged applications, and multiple ESB instances.

Security

**Oracle Identity and Access Management Suite Plus** provides an integrated, modular architecture that enables customers to deploy a complete access solution for securing applications, data, Web services, and cloud-based services. It provides a broad feature set including: authentication and single sign-on, mobile and social sign-on, entitlement management and fine-grained authorization, fraud detection and risk-aware authentication, security tokens services, and identity federation.

Management and Monitoring

**Oracle Enterprise Manager** provides end-to-end, integrated application monitoring and management including user experience management, performance management, change and configuration management, patching, provisioning, testing, integrated diagnostics, and automatic tuning. Oracle Enterprise Manager also provides a comprehensive management solution for Oracle and non-Oracle middleware technology including out-of-the-box availability and performance monitoring, robust diagnostics, configuration management, and lifecycle management.

Systems Product Mapping

The product mapping sections above describe the Oracle software products that can be used to realize the customer experience solution. Of course software must be hosted on hardware and, since the Oracle software is standards based, it can be hosted on a wide variety of hardware systems in a traditional IT environment, a Cloud environment (public or private), or a combination.

Oracle has developed hardware systems specifically for Oracle software – engineered systems. These engineered systems incorporate hardware and software designed and built to provide the best possible performance and scalability. Additionally, the engineered systems provide top to bottom management and monitoring (via Oracle Enterprise Manager) and, due to the predefined configuration, include industry leading product support. Thus, although the customer experience software products can be hosted on a wide variety of hardware system, the Oracle engineered systems provide a uniquely capable hosting platform.

Figure 13 illustrates four types of engineered systems that would provide a superb platform for the customer experience solution.
From left to right, the systems shown in Figure 13 are:

**Oracle Exalogic Elastic Cloud** is designed, optimized, and certified for running Oracle applications and technologies and is ideal for mission-critical middleware and applications from Oracle and third-party vendors.

**Oracle Exadata Database Machine** is a complete package of servers, storage, networking, and software that is massively scalable, secure, and engineered for redundancy that provides extreme performance for both data warehousing and OLTP applications.

**Oracle Big Data Appliance** combines optimized hardware components with new software to deliver the most complete solution for acquiring, organizing, and loading unstructured data into an Oracle Database.

**Oracle Exalytics In-Memory Machine** is the industry's first in-memory BI machine that delivers the fastest performance for business intelligence and planning applications.

Figure 13 illustrates how the engineered systems can leverage the included InfiniBand network capabilities to provide a high-throughput, low-latency connection between the...
engineered systems. Where latency and throughput are less critical (e.g. connecting to the rest of the datacenter), the engineered systems also include 10GB Ethernet capability.

Only one of each type of engineered system is shown in the illustration but, depending on the computational load, multiples of the engineered systems might be used to host the customer experience solution. For smaller workloads, Exalogic and Exadata also come in quarter and half rack configurations.

Organizational Impacts

In many companies, the customer lifecycle spans multiple organizations or divisions within the company’s organizational structure. For example, Web commerce may be a different line of business than in-store retail while service and support might be in yet another division. Unfortunately this type of organization structure means that no single person is responsible for providing an end-to-end customer experience. This in turn usually results in a fragmented customer experience.

In order to deliver exceptional customer experience, an emphasis within the business must be put on customer experience specifically from the customer’s perspective i.e. a customer-centric approach. This requires that the company take a holistic approach to address the total customer experience as opposed to a siloed approach. Thus, both the business and IT need to be organized and incentivized to deliver exceptional customer experience.

Implementation

For most organizations, the journey to a complete, modern, and truly differentiating customer experience solution is best taken in steps. Given the scope of the effort, this is also a path best not traveled alone. To help you devise a plan, quickly achieve success in each phase, and build with a consistent architecture from start to finish, Oracle Services and the Oracle Partner Network offer expertise and experience to complement your in-house skills and competencies.

Oracle’s services span all phases of the lifecycle. From early questions about what to do first and what to deploy on-premise or in the Cloud, Oracle can provide decision models and best-practice-based recommendations. Regardless of whether your solution involves upgrades, migrations, new installations, integration, or all of the above, Oracle Consulting is uniquely qualified to help – delivering Oracle expertise and a single point of accountability with strong connections to Oracle Development, Oracle Support, Oracle Technology Partners, Oracle Integration Partners, and other important players in your implementation. Oracle provides your staff with the knowledge and assistance needed to get the most of your Oracle solution
through world-class product training and global enterprise support. With Oracle as your strategic partner, you can count on continuous innovation and ongoing enhancements fueled by Oracle’s unparalleled investment in research and development. As a result, your solution can evolve even as we extend it to improve other business processes shaping your customers’ experience.

Conclusion

Companies today operate in an environment where traditional methods of differentiation are less effective and customer experience has become the primary differentiator and driver of business value. To successfully compete, companies need to create consistent, connected, and personalized brand experiences across all touch points and all devices.

The cross-channel customer experience reference architecture described in this paper delivers:

- A full set of commerce capabilities including guided navigation, targeted and personalized recommendations, and accurate order fulfillment
- Integrated loyalty and marketing capabilities
- Service and support capabilities to quickly resolve customer questions, issues, or problems via self service or agent assist
- A consistent, accurate, real-time view of all relevant information
- Predictive and semantic analysis of all customer interactions that can be leveraged across departments to enhance the customer experience

The Oracle products that provide the capabilities were described and mapped onto the logical architecture to illustrate how Oracle products can be used to realize the customer experience reference architecture. The breadth of Oracle’s products related to customer experience is unmatched in the industry today and, therefore, Oracle can uniquely help companies deliver exceptional customer experience.

Further Reading

IT Strategies from Oracle

IT Strategies from Oracle (ITSO) is a series of documentation and supporting material designed to enable organizations to develop an architecture-centric approach to enterprise-class IT initiatives. ITSO presents successful technology strategies and solution designs by defining architecture concepts, principles, guidelines, standards, and best practices.

There are several documents in the ITSO library that are particularly relevant to the customer experience reference architecture including:
• *Oracle Reference Architecture User Interaction*
• *Oracle Reference Architecture BPM Foundation*
• *Oracle Reference Architecture BPM Infrastructure*
• *Oracle Reference Architecture Service-Oriented Integration*
• *Oracle Reference Architecture Security*
• *Oracle Reference Architecture Engineered Systems*
• *Oracle Reference Architecture Management and Monitoring*

All of these topics are important to customer experience but were only briefly discussed in this paper. Please consult the [ITSO web site](http://www.oracle.com/us/products/index.html) for a complete listing of documents as well as other materials in the ITSO series.

Other References

Further information about the products described in this paper can be found on Oracle’s web site at: [http://www.oracle.com/us/products/index.html](http://www.oracle.com/us/products/index.html)