EXECUTIVE OVERVIEW

Whether for a CIO, VP of business operations, solution architect or director of development, day-to-day activities have probably taken on a greater sense of urgency with encroaching competition from not only other telecommunication companies, but also emerging wireless, cable and over-the-top (OTT) players.

As the competitive environment changes so too does the need to move from network-centric to customer-centric strategies. However, the perception of “quality service” by customers is greatly affected by latency in fulfilling customer orders or problems ensuing from lost, incomplete or incorrect orders. Too large a number of data service orders are cancelled before they are even fulfilled, and too much revenue is lost or mitigated because of manual processes and the cost of hiring new people when new services are rolled out.

There is a definite need for a solution that simplifies and modernizes fulfillment and order management stacks, such that Communication Service Providers (CSP) can achieve the business objectives of improving the following:

- **Offer Time to Market**: i.e. the time required to create offers, make service available;
- **Order Cycle Time**: i.e. the elapse time from order submission to when customer can use the service;
- **Operational Efficiencies**: i.e. the measure of productivity related to a CSP’s operating expenditures including systems and people.

This is not about replacing an order processing application. The solution is one that allows the CSP to selectively emphasize one or more specific business objectives, such as the offer time to market, right first time, order cycle time, manual content, operational agility, application consolidation.
With these goals in mind, IT and business heads must work together to create an integrated Offer Design and Order Delivery environment that is agile and flexible enough to quickly respond to changing business demands and to fulfill customer commitments.

In this paper, Oracle—the world’s dominant supplier of enterprise solutions, focuses on Order Management—the end-to-end orchestration of order fulfillment introduced under a Rapid Offer Design and Order Delivery (RODOD) solution.

A Closer Look At Order Management

Oracle, working with a large group of CSPs, has concluded that a prominent and distinct role exists for a Commercial Off The Shelf (COTS) solution to capture and fulfill orders efficiently and accurately and to provide visibility across the entire order lifecycle. This prominent role is called Central Order Management (COM).

COM refers to the series of activities involved in support of Offer Design and Order Delivery. COM is architected for a rapid Offer Design with a decoupled structure to deal with the diversity of a rapidly changing product catalog. It performs the activities to manage the Order Delivery process from the time of sales order submission through to order completion. All sales orders, including revisions/cancels, are received from any source. Un-fillable sales orders are prevented with the COM’s capabilities for Technical Service Qualification (TSQ). Unique order fulfillment plans are dynamically generated for all products. Each order fulfillment plan is coordinated across the enterprise, and any jeopardy is identified. All fallouts are managed. Additional OPEX is reduced because of COM being a convergent platform whose productized function is externally configurable.

RODOD transformations are complex programs, where success is highly dependent on sophisticated architectural designs well suited to their target scenarios. In this paper, we discuss robust architectural design principles for COM topologies — one in which the target scenario can be based on Oracle’s enterprise applications and middleware (e.g., Siebel CRM, Oracle Communications Order and Service Management, Oracle Product Hub for Communications and Oracle AIA for Communications).

With the combination of principles, technologies and deployment strategy, Oracle’s solution for COM will empower CSPs to design front- and back-office operations for new offers, as well as effectively manage provisioning tasks for end-to-end visibility across order processes.

The results of deploying COM are tangible, as faster system implementation and time to market, shorter order cycle time and lower OPEX are all benefits reaped by eliminating system silos built around individual products.
INTRODUCTION
This paper examines topics cited by CSP customers as the most pressing and important in terms of goals for order management and fulfillment—namely expedited time to market for new commercial offers and products, shortened time to accommodate customer sales orders, and enablement of operational efficiencies in those same processes.

This paper delves into a Rapid Offer Design and Rapid Order Delivery (RODOD) solution and the ways in which it satisfies those goals. It also offers specifics about how CSPs can successfully deploy Central Order Management for optimal results.

Whitepaper Objectives
In this document we want to share with the reader the following with respect to the Oracle solution:

- The main design principles, core function, flexibility necessary for a new generation of Central Order Management solution;
- Why a COTS solution for provides the Central Order Management capabilities required to meet the business objectives;
- The ways in which it simplifies deployment.

BUSINESS CHALLENGES
The telecommunications market is going through a substantial change in business models and even mindset, as encroaching competition ups the ante in reducing churn and improving brand loyalty. Simultaneous to these pressures are concerns about driving down costs while improving service quality; increasing customer bases while maintaining or reducing head count; and deployment of sophisticated/complex offers while expediting time to market.

In today’s climate of fierce competition in voice, data, video, IP TV and on-demand services, it is a competitive necessity to efficiently deliver and support complex, convergent services. With the proliferation of bundled offers, ever-expanding customer service channels, and increasingly complex provisioning and activation systems many CSPs are hampered by inefficient order management processes. Consequently, there are problems with slow time to market for new offers, as well as escalating order fallout due to manual processing, and prolonged order cycle time.

Offer Design Issues
The average time to launch new services ranges from ninety days to one year, with an average of ten to twenty days for modifying offers, according to a Yankee
Group study. CSPs find this unacceptable, as customers want new services, now! Ubiquitous TV, video, voice and data services are creating expectations of real-time, on-demand services that offer “instant gratification.”
Legacy BSS have become much less agile because order capture, order decomposition, order management and billing function are spread throughout numerous silo’d applications and data stores. The function is not consistently used as its importance varies department by department, each developing its own flavor of manual procedures according to its own needs.

As each application attends to a specific product, it is quite common that each silo’d application have its own version of the product catalog. Introducing a new offer or products requires availability of staff that possess some esoteric knowledge (e.g., how the commercial aspects of the product are coupled with the fulfillment systems).

As a result, projects to introduce a new offer have become increasingly unwieldy. The activities of stitching together an end-to-end view of the required changes has become manual and very time consuming. Manual effort including the use of expensive IT resources is required to update and synchronize the many data stores. The lack of consistency in data views among different facets of an organization makes billing vulnerable to errors. A significant amount of time and cost is required to change/test applications, data stores, policies, and manual procedures.

For these reasons, the Offer Design process has become a daunting experience for most CSPs. In fact, it is not uncommon that the time and cost constraints of these “projects” are so enormous that they delay early flow of revenue. In some cases, the time and cost discourages and prevent the introduction of innovative services.

**Order Delivery issues**

Order delivery complexity has increased with bundled products/services according to seventy-seven percent of CSPs surveyed, with eighty-six percent of CSPs indicating that this is contributing to increased transaction failures. Twenty-five percent of data orders are cancelled before being fulfilled, according to a KRC Research. This last metric can be attributed to the fact legacy order processing takes far too long because of the one-two punch of inadequate automation and increasing content of manual processing.

Legacy applications struggle to create complete and accurate orders from different sources containing varied and complex service bundles. Order revisions and cancellations add to the complexity of decomposing orders into accurate orchestration plans. These issues, have been prominent in instances of high order fallout and resource intensive manual processing.

The processing landscape—with its increasing diversity in fulfillment systems (automated and manual, internal and partner)—creates difficulty in attaining order status on demand. No single application provides a comprehensive order tracking capability across all fulfillment processing. This lack of visibility makes internal SLA management arduous. Without sufficient visibility it also limits opportunities to satisfy customer demands for self-service opportunities.
Time latency is the result of these less-than-optimal processing conditions which produces a time lag between the time a service is made available for customer use and the time the service is interfaced into billing. This causes usage records to go into error logs, further delaying reporting of revenue.

High OPEX Issues

IT organizations are under pressure to do more for the business with less infrastructure and cost. The business is introducing new offers, products, sales channels, and fulfillment partners that would all benefit from significant automation in order to ensure profitability. IT is evaluating its BSS/OSS as to how to provide the agility required to respond to business needs while at the same time reducing operational expenses. Increasingly complex logic is made more complicated thanks to the numerous product-based applications, the overhead of integration among them and the inherent shortfalls of custom-built solutions.

In other words, the complexity of order processing logic is increasing because of the diversity of format, relationships and contents of sales orders coming in from varied order capture sources (e.g. kiosks, internet, partners, retail and CSR). The numerous product-based applications are also contributing to the complexity. The logic to decompose and order into a fulfillment orchestration plan becomes progressively more difficult and expensive with every product or service that is introduced. Function is duplicated over the applications which only escalates the cost of support, maintenance and enhancement.

Manual effort continues to subsidize the inadequate legacy IT applications in their attempts to process complex service bundles, revisions, cancellations, fallouts, and billing discrepancies.

Custom-built function tends to be short sighted in nature, as they focus on only currently understood business requirements as opposed to the longer-term requirements for processing a multi-product order environment. According to Dataquest, one-half of service provider solutions fail to meet evolving business needs because of the high degree of customization.

Integration among the silo’d systems creates an enormous overhead. According to a Yankee Group survey, the typical ordering process needs to interface with eight to twenty different systems, and according to Stratecast, more than two-thirds of CSPs’ IT budgets are dedicated to integration.

Summary of Issues

Oracle has solicited and received input from many CRM and BSS customers, which have shared their concerns and priorities as summarized in Table 1:

<table>
<thead>
<tr>
<th>Operational Environment</th>
<th>Issues To Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
Massive number of commercial offers
- Product catalogue of tens of thousands of products, bundles and offers
- Multiple product catalogs to update

Demand to launch offers in days and weeks, not months
- Discrepancies between products being sold, billed, and fulfilled

Diversity of sales order contents and formats to fulfill
- Customer orders contain many combinations of products and services that appear as order line items
- Different fulfillment for different products
- Multiple dependencies within and between products on a sales order

Evolving fulfillment systems and suppliers in the business
- Fulfillment varies from product to product across a typically complex topology of systems
- Multiple instances of a fulfillment system type are common
- New LoBs may change systems
- Mergers and acquisitions change systems

Push to manage unique fulfillment needs of every customer order
- Customer Orders contain many combinations of products and services as order line Items
- Different fulfillment for different products
- Dependencies within and between order items
- Fulfillment spans a diverse topology of systems and suppliers

Large number of revisions, changes and order types to accommodate
- Customers make revisions to a number of in-flight orders
- Order can have dependencies between line items and between orders
- Fulfillment spans a diverse topology of systems

More complex order status and fallout management
- Provide visibility to order processing fallouts
- Cannot provide customers and CSR’s with real time visibility of order status

Table 1 – Business Concerns and Priorities

**SOLUTION: RAPID OFFER AND RAPID ORDER DELIVERY**

A CSP’s ability to introduce new products and services quickly (and frequently) are necessary in order to enhance customer satisfaction, augment existing and new revenue streams, and improve brand image and competitiveness. When so many companies are racing to boast innovation and the “cool” factor, it is imperative that CSPs embrace Rapid Offer Design for introducing new products and services. Doing so requires two intertwined elements: a BSS architected for agility around newly introduced products and services; a process of Offer Design that is highly automated and enabled (not hindered).

Naturally, CSPs are not deploying a new COM solution for the sake of replacing an existing order processing application. They already have a fragmented set of order processing applications, so why would they increase the problem with yet another siloed order processing application? CSPs have each voiced an explicit set
of business objectives (including those from IT). Typical metrics provided by CSPs show a need to close the chasm between Present Mode of Operation (PMO) and Future Mode of Operation (FMO), as presented in Table 2.

<table>
<thead>
<tr>
<th>Offer Time to Market Objectives</th>
<th>PMO</th>
<th>FMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to introduce new offer</td>
<td>Weeks</td>
<td>Days/Hours</td>
</tr>
<tr>
<td>Time to Introduce a new Product/Offers</td>
<td>Months</td>
<td>Weeks/ Days</td>
</tr>
<tr>
<td>% of Revenue from new Product/offers</td>
<td>15%</td>
<td>60%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order Cycle Time Objectives</th>
<th>PMO</th>
<th>FMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right First Time: Order Submissions to completion (end to end)</td>
<td>60%</td>
<td>99%</td>
</tr>
<tr>
<td>Cycle Time: Order Submissions to completion (end to end)</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Billing Discrepancies</td>
<td>25%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational Efficiency Objectives</th>
<th>PMO</th>
<th>FMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Content in Order Delivery</td>
<td>65%</td>
<td>5%</td>
</tr>
<tr>
<td>Manual Cost in Order Delivery</td>
<td>$40m</td>
<td>$5m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT Efficiency Objectives</th>
<th>PMO</th>
<th>FMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of IT order processing applications to operate</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>IT support of business configuration</td>
<td>90%</td>
<td>20%</td>
</tr>
<tr>
<td>IT cost to customize, support, enhance &amp; maintain</td>
<td>$25m</td>
<td>$4m</td>
</tr>
</tbody>
</table>

Table 2 – Business Objectives: Gap between PMO and FMO

Oracle’s Rapid Offer Design and Rapid Order Delivery solution (RODOD) has been designed to bring together PMO and FMO through an efficient and cost effective design that delivers new products and services with present capabilities and future goals in mind. With RODOD, CSPs can effectively manage front- and back-office operations for new offers, as well as capture and efficiently manage order provisioning tasks for end-to-end visibility across the order life cycle processes as summarized in the Figure 1.
RODOD is a comprehensive solution consisting of Oracle's Siebel CRM, Oracle Communications Order and Service Management, Product Hub for Communications and AIA for Communications. Complementary products include Oracle BRM, and service fulfillment Oracle UIM and Oracle ASAP. The components of the Oracle RODOD solution are depicted in Figure 2.
- Oracle Siebel as CRM provides sales catalogue definition, multi-channel order capture and customer support;
- Oracle Siebel Service provides support for trouble ticketing;
- Oracle Order and Service Management (OSM) performs order mapping, decomposition, TSQ during order capture and orchestration and central management of order changes, fallouts and status;
- Oracle Billing and Revenue Management (BRM) provides account management, offer purchase, rating and billing;
- Oracle AIA for Communications provides productized and extensible integration between the Oracle components for Offer Design and Order Delivery.
- Oracle OSM plays the role of Central Order Manager (COM). Oracle, along with a large group of leading CSPs, concluded that a prominent and distinct COM role exists for a Commercial Off-The-Shelf Solution (COTS) such as the capture and fulfillment of orders that provides visibility across the entire order lifecycle. A COM system has the role of managing the fulfillment of a customer sales order from the point at which the sales order is received from the order-capture system (typically a CRM), through to its completion, which includes the orchestration of all major functions performed by local fulfillment systems. The COM also ensures the CRM system is informed of the status of orders being fulfilled, from inception to completion.

Although not detailed in this paper, OSM can also play the role of Service Order Management (SOM). A SOM system manages more “coarse-grained” logical functions necessary to fulfill an order such as provisioning.

**Design Criteria Matched with CSP Business Objectives**

RODOD is a new-generation solution in that its design criteria has been matched with sought-after business objectives. Oracle’s extensive work with customers and prospects revealed specific business needs, such as faster time to market, superior visibility, lower-cost fallout, enhanced customer experience and low-cost/agile deployments.

Table 3 presents the alignment of RODOD design criteria with CSP business objectives.

<table>
<thead>
<tr>
<th>Business Objectives</th>
<th>Design Criteria</th>
</tr>
</thead>
</table>
| Faster time-to-market  
• Once identified by marketing, introduce more of the same commercial | Decouple commercial offerings and fulfillment flows. |
offerings within hours.

- Once identified by marketing, and the infrastructure is ready, then introduce new services within days.

<table>
<thead>
<tr>
<th>Low-cost, agile deployment</th>
<th>Enable product and order-driven fulfillment flows.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior visibility and experience</td>
<td>Decouple fulfillment topology and fulfillment flows.</td>
</tr>
<tr>
<td>Lower cost of fallouts and enhanced customer experience</td>
<td>Enable a configurable and streamlined order fulfillment status.</td>
</tr>
<tr>
<td></td>
<td>Control fallout conditions. Manage fallout incidents.</td>
</tr>
</tbody>
</table>

Table 3 - Alignment of RODOD design criteria with CSP business objectives

Although the business drivers may vary in priority among CSPs, the total set are reflected directly in the design criteria adopted by Oracle for RODOD. In addition, there is common theme underlying the design criteria and the resulting functional capabilities described in this section. The theme is one of enabling convergence, hence a solution that can reduce the number of siloed applications, and one that can be easily configured (and reconfigured) in support of evolving business needs.

A CSP’s product and service definition methodologies have the greatest effect on time to market and on the cost/agility of deployment. Probably the most important design criterion is to decouple the fulfillment topology from products and fulfillment flows to increase the operational agility of the solution, reduce costs of maintaining fulfillment flows, and decrease time to market when introducing new products.

**Decoupling Fulfillment Flows & Fulfillment Topology**

A CSP’s ability to decouple fulfillment topology from products and fulfillment flows increases the agility of the solution, reduces costs for maintaining fulfillment flows, and decreases the time to market when introducing new products. The fulfillment topology shown in Figure 3 is typical of most CSPs with a few products. Each additional product would increase the complexity of the topology with more siloed fulfillment system stacks.
OSM recognizes fulfillment systems by type, which allows CSPs to abstract fulfillment topology in such a way that fulfillment flows and product specifications are not affected by common changes to fulfillment topology. In figure 4, an overlay of system types are place on the typical topology depicted in Figure 3.

The various fulfillment systems are first recognized as different fulfillment system types. Each fulfillment system type is recognized to support one or more fulfillment functions. These fulfillment functions are the seeds used to build fulfillment flows. Only at the time of interfacing with a fulfillment function a particular provider is designated and invoked. With this approach, fulfillment flows are not sensitive to number and domain of a CSP’s fulfillment providers.

When executing the fulfillment flow, the system uses routing rules to guide a fulfillment function request to the relevant fulfillment system provider. This
approach abstracts the fulfillment topology such that fulfillment flows either are not affected or only minimally affected by fulfillment topology changes.

As adding fulfillment system types and new fulfillment functions can have a substantial impact on the number and complexity of the fulfillment flows, the routing rules in OSM would need to be extended by a simple configuration (if the additions are relevant to existing fulfillment flows). However, Oracle believes that the OSM design is much more efficient than any other known approach.

**Product Definition and Mapping**

Often, products and services are defined in different network, IT, and business departments to serve the specific interests of individual departments. This approach creates a challenge for bridging the gaps at runtime. Oracle recommends a balanced approach that would require departments to make calculated compromises—the result of which is a simplified overall product life cycle and business flows.

Oracle OSM uses a product model that is aligned with terminology and guidelines from TM Forum’s Information Framework. Oracle’s product model covers the three fundamental entities: Product, Service and Resource. Commercial products are core sellable entities. Commercial bundles and commercial offers are a packaging of commercial products for the purpose of re-use and of meeting marketing goals. Commercial bundles group products and discounts either for direct sales or for re-use in multiple commercial offerings. Commercial offerings group commercial products. Figure 5 depicts the Oracle product model.

![Oracle Product Model](image)

**Figure 5 – Oracle Product Model**

OSM uses Product Specifications to core product definitions and acts as the anchor point for mapping order lines to fulfillment actions and for mapping order lines to service specifications in the Service Order Fulfillment layer. Oracle recommends that product specifications be nested in a class hierarchy for best
optimization. OSM’s approach ensures many product classes map to one, and only one, product specification in order to simplify mappings in the Customer Order Fulfillment layer.

Sophisticated, Centralized Metadata

Metadata provides OSM with the agility required for the BSS to introduce rapid change. OSM’s core function is controlled by externally configurable metadata that stores the business rules so that the application behaves according to specific policies and procedures. Examples of core function that is controlled by metadata are the processing orders received from order capture sources, handling order revisions, decomposing orders, and interactions with fulfillment systems.

Canonical Data Model

The order management solution will be deployed in the middle of the BSS and integrating with many new and legacy systems. OSM uses a canonical data model provided by Oracle’s AIA that is based on TM Forum’s Information Framework. AIA provides out-of-the-box productized integration using the canonical data model to be shared among all the solution component application participating in the fulfillment process. This greatly reduces the time for deployment as it mitigates the complexity of supporting varied interfaces, eliminates data adaptation logic.

Solution For Rapid Offer Design

CSPs are introducing new offers for their customers at an extremely rapid pace as they respond to the competitive pressures described at the beginning of this paper. In many cases, a new offer consists of minor variations of existing product offerings or the bundling of these products into packaged offerings. The RODOD solution provides the ability for business users to introduce these offers in days or perhaps hours. The components of RODOD involved in Rapid Offer Design are depicted in Figure 6.

![Figure 6 – Rapid Offer Design: Solution Components](image-url)
Master Product Catalogue

To provide Rapid Offer Design, the solution must have an enterprise product catalog that is the master of all marketing related product and service information. This master would be used by all applications (e.g., CRM, Billing, Order Management) that require product-related information. If a master catalogue to replace all other siloed product catalogs is not feasible, then the alternative is to deploy the master to update and synchronize all other product catalogs. Either of these approaches would reduce the time and effort dedicated to updating and synchronizing product data across applications.

As depicted in Figure 6, RODOD provides Oracle Product Hub for Communications to help CSPs master product information from heterogeneous systems, thus creating a single view of products. This master can be leveraged across the entire solution footprint, as data can be published to siloed legacy and vendor catalogs. This function brings benefits such as:

- Reduction in time and cost of updating data stores
- Enables consistent processes
- Improves accuracy of data used by the order delivery process

End-to-End View Of Business Rules & Data

The Rapid Offer Design solution should have an automated tool that provides an end-to-end view of the business rules and data used by BSS order delivery applications. This tool would assist in quickly assessing the impact of marketing’s introduction of new offers, bundles, products and services on the BSS. It can also make visible the opportunities for re-use of previously created and proven business rules and data. OSM provides Design Studio, a design time configuration tool for providing a single, comprehensive view of all existing rules and data attributes used for Order Management.

Zero Configuration

A Rapid Offer Design solution supports two different Offer Design processes.

The first Offer Design process involves the introduction of a net new offering, for example a new product such as WiMax, can take up to one year and can cost a CSP a lot in terms of time and resources and lost revenue. Typical business requirements now call for a net new product to be introduced in a three- to four-month timeframe with far less resources. With OSM, there is a one-time configuration of the fulfillment process when launching a new product class, such as WiMax. Once product catalogs are synchronized using the solution, then:

- Offers and bundles, and service eligibility can be defined in Siebel CRM;
- OSM’s Design Studio is used to configure (and re-use) fulfillment workflows, orchestration and decomposition rules and order management procedures.
With RODOD, the steps, sequence and automation to configure a net new offering is depicted in Figure 7.

The second Offer Design process - the introduction of a new market offer or price plan, is a frequent request and needs to be relatively instantaneous. Today, it can take several days and perhaps weeks, as numerous siloed data stores need to be updated and tested. Typical business requirements now call for these actions to be accomplished within a day or even hours. With OSM, the product-class matching capability allows users to reuse business rules for products under the same class, (where a class is e.g. broadband, mobile, IP Phone). This capability allows similar products to be launched without redefining additional provisioning rules. In these cases, there is no impact to fulfillment flows with RODOD when launching:

- A new price plan for existing services;
- A new offer combining existing services;
- A new product within an existing product class (e.g. adding 8 Mbps DSL to existing 2 & 4 Mbps DSL).

Solution For Rapid Order Delivery

CSPs are under pressure to significantly improve customer order delivery for customer and competitive reasons. Improvements are required to process orders right the first time, within reduced delivery cycles and with less cost. A Rapid Order Delivery solution must also support a consistent Order-to-Activate business process. This process extends from the time a quote or order is created to the time when the services and goods are delivered and properly billed. The components of RODOD involved in Rapid Order Delivery are depicted in Figure 8.
Flexible Order Capture

There are multiple channels by which sales orders can be submitted – call center, retail store, online self-service, solution sales, a partner, door-to-door and increasingly from non traditional such as from social networking. Each channel may capture the order in a different format. To provide flexible and convergent order capture, OSM is be capable of accepting all types of orders, any format with any product complexity from any order capture source.

OSM provides out-of-the-box core functionality for situations more complex than the traditional order types described as MACDs, (i.e. Move, Add, Change and Deletes). OSM supports the new-generation CRM solutions and business operations that require more granular requests, such as order, create, find, get, update, suspend, resume, cancel, abort, fail, and resolve. OSM can recognize and automate the processing of more complex order types, such as future-dated, follow-on, TSQ, revision/cancel, cross-order dependencies and job (batch and bulk), priority and single or multi-phase billing of orders.

Technical Service Qualification (TSQ)

To eliminate orders that cannot be fulfilled because, for example the service is unavailable at the desired location, OSM will perform a TSQ. Because OSM can be configured to perform a TSQ for any and all items on an order, TSQs are especially effective on orders with offers of bundled products where any one product could be unavailable and cause the complete order to be unfilled. By performing the TSQ at time of contact with the customer, if the order proves to
be incapable of being fulfilled, then the customer perhaps can be offered alternatives. At least customer expectations can be managed.

Capabilities will include in-flight revisions and cancellations; technical service qualification across all channels; identification of order fall-outs and submission to an enterprise trouble ticketing process.

**Dynamic Orchestration Plan Generation**

OSM has the capability to dynamically change its execution, its fulfillment logic and behaviour depending on the data contained in the order, (e.g. products, locations, customer) and the CSP provisioning business rules and policies. Once validated, the order is decomposed. Order de-composition refers to the ability of OSM to dynamically identify the various components of an order – its individual line items and generate a unique orchestration plan for the fulfillment of this order and all its line items. OSM then uses the orchestration plan to manage the fulfillment activities specified in the plan, taking into account any identified dependencies and constraints.

**Order Change management**

It is quite common for customers to make changes to their order once it has been submitted. The ability to automate the processing of all revisions/cancels is important for customer satisfaction. OSM provides a clean way of handling such changes through its Order Change Management capability. OSM recognizes all revision/cancel order to an in-flight order by evaluating key values on the order. OSM allows appropriate compensation actions depending on the nature of the change. OSM will automatically create a compensation plan for each revision by determining which fulfillment interaction tasks require and undo/redo and handling point of no returns (PONR).

**Interaction With Fulfillment Systems**

OSM manages the interactions with Fulfillment Systems by honoring the system contracts for all fulfillment functions, including requests, responses and compensation logic. A critical element of system interactions is that they accommodate processing granularity for each fulfillment function separately. In addition, OSM also accounts for all possible responses and allows for multiple updates in the course of a single fulfillment function, including mapping of responses to an order line and order status updates.

**Fallout Management**

Fallouts are increasingly a large cost to the CSP. Many fallouts can be reduced by the previously discussed OSM capability for Technical Service Qualification (TSQ). However, fallouts will occur perhaps a breakdown in process or problems with a fulfillment application. As part of its COM role, OSM performs the function order fallout management. It receives internal notification of fallouts and sends them to a
trouble ticketing application. OSM will create and route trouble tickets to systems such as Oracle’s Siebel Service application which provides rich and robust support to a user for investigating and resolving the fallout.

During order fulfillment, a given action may not complete successfully. This may be due to a number of reasons – inconsistent information, external application issues, etc. In such cases there is a need to provide a streamlined process for managing these errors – or fallouts – and enable successful order completion. OSM provides out of the box support for the creation of a trouble ticket in an error management system. Using Siebel's Service module as the error management system provides the operations teams with a single point of information to learn about these failures and take necessary corrective actions. Once completed, the order can be resubmitted for processing to continue.

Order Status Management
Management visibility into performance of order processing is essential to attaining business objectives. To provide order status management, OSM provides a comprehensive set of events that can be configured to a CSPs specific objectives and OSM tracks progress of orders during order fulfillment, thereby providing real-time updates to CRM on order milestones and providing operations management updates for event and jeopardy notifications. OSM also provides an API by which a BAM can retrieve the order processing activities of interest.

Structure and Flexibility Drives Deployment
As a new-generation, COTS-based order management solution, OSM provides the structure and flexibility that contributes to a quick and successful deployment. This section describes how the core functional components and the metadata focuses the activities of the deployment team and provides simplicity and guidance for organizing the team.

Unlike custom-developed solutions, OSM has been designed for simplification based on a convergent order management function out of the box. Custom-developed solutions such as those based on middleware-based BPM workflow must first design an emulation of core order management functions before tailoring specific business rules.

With OSM, the core order management function already exists. Therefore, deployment activities can immediately start with the gathering of the CSP’s particular business policies, rules and procedures. The structure of OSM metadata further guides the activities to enable OSM core function per the specific requirements of the CSP.
The enablement process should be viewed as a simple two-step process:

1. Information gathering as guided by OSM’s structured metadata;
2. Configuration of information into the metadata using OSM’s design time configuration tool - Design Studio.

Focus for Enabling Order Management

To enable OSM, the deployment team must focus on gathering information and enabling four key functions:

1. Synchronizing OSM with CRM Product Catalog;
2. Interfacing OSM with CRM;
3. Centralizing Order Management;
4. Interfacing with Fulfillment Systems.

To enable synchronization of OSM with the product catalog, the product classes need to be specified. This activity is of great importance to Rapid Offer Design as OSM uses product classes to simplify the synchronization with the CRM product catalogue. The CRM product catalogue may have thousands of commercial offers and bundles, typically built on 50 to 100 products. In most CRM applications, product classes define the “specification” (i.e. attributes, templates) for commercial products. A commercial product is an instance of a product class. In OSM, the same product class information stored in the CRM is stored in product class metadata. The team needs to gather information about product classes, their data attributes, and relationships among product classes and commercial products.

To enable interfacing between OSM and CRM, “Recognition Rules” are specified to provide the flexibility to receive and validate any and all types of orders from all order capture sources. Guided by metadata, the deployment team needs to gather information about order sources, types, data structure, rules for validations and data enrichment.

Also for interfacing with the CRM, OSM uses metadata called “Order Item Specifications” to provide the flexibility to recognize and examine line items on an order for any service and order type. Guided by metadata, the team needs to gather information on how to identify Order (line) Items—their hierarchies and dependencies, rules to extract items, and data from the order, and the relationship between order item and products enrichment.

OSM uses a consistent but flexible structure to decompose and generate the orchestration plan. To attain the consistency but provide flexibility to support any kind of order decomposition, several metadata entities are used. Product Specification metadata provide an indirect link between the order item and fulfillment flows. These specifications are core product definitions of a technical service and are also the anchor point for identifying the fulfillment flows. Other metadata controls the decomposition stages, processes, sequences, and
dependencies. Combined with the data from the incoming order, the metadata dynamically controls the generation of a unique fulfillment plan for that particular order. The team needs to gather information that describes the product, the use cases for a sunny-day orchestration plan in terms of stages, process, etc. along with identifying the data required for the interactions with the fulfillment systems.

For order revisions/cancels, the team must define the desired interaction required, including point of no returns, with each fulfillment system. No need for definition of exception management workflows. The team must then gather information about the processing rules for revisions/cancels and the policies for PONR. This is a configurable capability – no need for custom code development.

For order status management, the team must gather information about the sales order status and order jeopardy notifications required by CRM and business operations systems. The team needs to determine what data to extract and interface to the BAM and then the team has to perform the configurations accordingly.

For automated interfaces with fulfillment systems, the team must gather information about the fulfillment system topology, the interactions required between OSM and each of the fulfillment systems (e.g. requests, data, responses and message formats). Similar information is necessary for manual fulfillment activities, if required.

OSM's structure also guides the deployment team as to the sequence of gathering information and configuring the metadata. The sequence of activities and dependencies for enabling the four key functional areas of OSM are depicted in Figure 9.

Figure 9 – Sequence for Gathering Information and Configuring Metadata
Team Organization For a Successful OSM Deployment

Defining the deployment team structure—its staffing and alignment with stakeholders—is a key decision for successfully implementing any solution. The importance of the solution to attaining business objectives combined with the structure, flexibility and externally configurability of OSM, there is a need and an opportunity to emphasize the deployment team’s skill, knowledge and responsibilities in favor of the business.

The organization of the team should be such that certain business factors are strongly represented in addition to the required IT knowledge. Examples of such factors are a focus on the business objective, leadership by the process owner and an abundance of business knowledge. A simple and effective way to demonstrate these factors to the deployment team is to create sub-teams based on the four functional areas of OSM as depicted in figure 10.

Figure 10 – Deployment Team Structure

The result of mapping the business factors and IT knowledge to this sub-team structure is provided in Table 4.

<table>
<thead>
<tr>
<th>Sub-Team</th>
<th>Process Owners</th>
<th>Business Objective</th>
<th>Required Business Process Knowledge</th>
<th>Required IT Application Knowledge</th>
<th>OSM Configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface with CRM</td>
<td>Customer Relationship Management</td>
<td>Order cycle time, Efficiencies</td>
<td>Business Process: Order Submission,</td>
<td>Legacy Order Processing, OSM, ESB</td>
<td>Recognition Rules, Order Item</td>
</tr>
</tbody>
</table>
Table 4 – Business IT Factors Mapped to Deployment Team

OSM's configurable metadata provides an important benefit to individual CSPs, as it allows them to selectively emphasize their specific business objectives when configuring core functionality. For example, the deployment team can emphasize improvement objectives with synchronizing the product catalog, or status reporting, or fallout management, or convergence of applications or actions to minimize manual content. The team can emphasize the processing rules and function for any one of the configurable capabilities in order to attain business objectives such as reduced time to market, shortened order cycle time, and operational efficiency for business/IT.

RODOD with OSM brings innovations to order management that will provide tremendous value to a CSP struggling with today's operational environment. Those innovations and their value are summarized in Table 5.

<table>
<thead>
<tr>
<th>Operational Environment</th>
<th>Order Management Innovations (OSM)</th>
<th>Value</th>
</tr>
</thead>
</table>
| Need to support massive number of commercial offers | • Synchronize product class information from master product catalogue | • Keep product definitions in lock-step among CRM, BRM, OSM  
• Reduce in fallout due to product discrepancies |
| Expectation to launch offers in days and weeks, not months | • Decouple commercial offerings from fulfillment flows  
• Re-use of fulfillment flows across many products | • Launch new offers and products that are within the same class with zero changes to fulfillment  
• Reduction in maintenance and management  
• Faster time to market with offers |
| Accommodate diversity of sales order contents and formats to fulfill | • Optimize fulfillment re-use with product specifications  
• Understand how to fulfill each line item on the order  
• Enforce line item level dependencies within and between product orders | • Dramatically reduced configuration and maintenance |
| Interface to | • Fulfillment flows are | • Faster adoption of changes to |

Table 4 – Business IT Factors Mapped to Deployment Team

<table>
<thead>
<tr>
<th>Interface with Fulfillment</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfillment, Billing, WFM, logistics, Trouble Ticketing</td>
<td>Order cycle time, Efficiencies</td>
</tr>
</tbody>
</table>

OSM automation framework, Processes, Tasks
evolving fulfillment systems and growing number of suppliers in the business
decoupled from fulfillment topology
fulfillment systems and suppliers, such as adding a new provisioning stack; consolidating two billing providers into one, etc.
- Simpler, highly reusable fulfillment flows that contribute to lower implementation costs and faster time to market

Manage unique fulfillment needs of every customer order
- Dynamically generate the orchestration plan for any combination of products on a customer’s order
- Orchestration plans that are tailored to the customer’s order every time
- Dramatically reduced configuration and maintenance

Satisfy large number of revisions, changes and order types
- Productized capabilities for delta-analysis and compensation plan generation
- Productized support for related orders, change orders and follow-on orders
- Dramatically reduced manual effort to deal with exceptions and revisions
- Eliminate need for custom coding to deal with revisions

Support order status and fallout management
- Configurable “notifications” ability to provide any-time visibility of order status at a line-item level
- Productized support for trouble ticket creation in Siebel
- Greater customer satisfaction with real-time order status visibility
- Reduce revenue leakage and loss through streamlined fallout management

Table 5 – Oracle OSM Innovations and Their Value to the CSP

**CONCLUSION**

CSPs are under tremendous pressure to compete for customers with a new generation of complex products and services to attain their revenue and profit goals. Business objectives of rapid time to market, rapid order delivery and improved operational efficiencies cannot be attained by the fragmented and siloed legacy BSS/OSS. Priority is now being focused on selecting a new generation of COM solution that simplifies and modernizes fulfillment and order management stacks, such that Communication Service Providers (CSP) can achieve those business objectives of improving:

- Offer Time to Market: i.e. the time required to create offers, make service available;
- Order Cycle Time; i.e. the elapse time from order submission to when customer can use the service;

- Operational Efficiencies: i.e. the measure of productivity related to a CSP's operating expenditures including systems and people.

The new generation of order management is not replacing an order processing system. The solution is one that allows the CSP to selectively emphasize one or more specific business objectives, such as the offer time to market, right first time, order cycle time, manual content, operational agility, application consolidation.

Oracle wants to demonstrate the benefit of an innovative approach of Order Management to any CSP starting to face the transformation journey.