

Simplifying Complexity of Customer Premises Equipment Provisioning for Business Users

Powered by Dynamic Logical Order
Processes



A Joint BT & Oracle White Paper
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EXECUTIVE OVERVIEW

British Telecommunications (BT) is a global leader delivering innovative IT and network solutions to business customers worldwide. BT is transforming its business, leveraging its next generation 21CN¹ network platform to build a customer-centric organization focused on innovation and speed to market. It has adopted an 'Oracle First'² approach to strategically use COTS applications from Oracle to help it deliver and accelerate standardization and process re-engineering across its entire IT infrastructure.

Large Enterprise Services are an economic growth engine for BT requiring a flexible Operations Support System with the capacity to handle customer demands efficiently, since enterprise services are inherently complex to deliver and support a vast spectrum of different types of customer-premises equipment (CPE) that can range from a simple desktop device to a complete trading floor for a bank. BT CPE portfolio has over 20,000 products supported by over 40,000 order processes in the existing CSS system. Additionally, BT added another 2,000 new products in 2008.

There are the two primary compelling drivers that underpinned BT's CPE Transformation Program. First, BT's existing Custom Service System (CSS) to deliver the CPE service portfolio required a high level of customisation effort

1 The 21st Century Network (21CN) programme is the network transformation project of BT to support PSTN and other many services over a next generation IP system. Principally 21CN is to enable the customisation of services through software-driven innovation with the focus on customer centricity.

2 'Oracle First' approach is to use Oracle products suite to achieve business objectives and build a long-term strategic partnership between BT and Oracle.

leading to long lead time to introduce new or modify existing products. The second compelling event was BT needed to align with the Office of Communications (Ofcom) regulatory requirements to provide an open and equal service of provision and repair in the "last mile" of network access which applies the same operational conditions to all BT CPE products.

Instead of using the traditional automated order fulfillment systems to deliver a large variety of communication services with thousands of order processes defined to meet the requirements of Small-Medium Enterprise (SME) and Enterprise users, CPE transformation program deliver a new and innovate approach that enabled BT to replace 40,000 order processes with a single generic but dynamic order process as well as have provided operations team with the ability to create custom processes on demand in real time.

This whitepaper describes BT's innovative approach to leveraging COTS capabilities to deliver the transformational change across its very important line of business. This paper discusses

- Being Customer Centric means absolute focus on Customer Satisfaction
- Building an Operations Support System that is adaptive to rapidly changing product environment that is
- Transforming BT's business through intelligent use of COTS based products.
- It walks through a real example of a transformation project using 100% COTS-based Oracle Communications Order & Service Management and Inventory applications

PROJECT OVERVIEW

At the heart of this major transformation is CSS. It is at the very heart of the organisation and has been for some 27 years. Migrating from this huge legacy system to a new architecture is not a trivial exercise.

The Office of Communications (Ofcom), the independent regulator and competition authority for the communication industries in the United Kingdom, requires BT to separate its systems stack and has to provide an open and equal service of provision and repair in the "last mile" of copper wire. BT OpenReach has greater separacy from the rest of the business in order to facilitate local loop unbundling (LLU) and is designed to ensure that other CSPs have exactly the same operational conditions. As such, BT Global Services (BTGS), BT Retail (BTR) and BT Wholesale (BTW) have become part of this major transformation.

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BTGS used CSS to deliver the Customer Premises Equipment (CPE) service portfolio. This incorporated some 20,000 products and over 40,000 order processes. In terms of contribution to the BT business, CPE generates around \$1.2 billion of revenue per year. This required over 2,000 office staff and some 3,000 field engineers.

CPE is any terminal or other service provider equipment that is located at a customer's premises (physical location) rather than on the provider's premises. CPE can range from telephone handsets through to Digital Subscriber Line routers to more complex products covering an entire bank's trading floor. Today, almost

any end-user equipment can be called customer premise equipment and it may be owned by either the customer or the provider.

As the key objective of this transformation project was to migrate the provisioning of CPE portfolio from CSS to a new COTS based Order Management solution built on Oracle Communications Order & Service Management (OSM) for decomposition and orchestration, and supported by Oracle Inventory³ for resource and service management.

Even though we were migrating to COTS based solution architecture (supported by Oracle Siebel CRM, OSM and Inventory) the project was a major undertaking with large inherent risk because of the level of complexity being managed by CSS. This project had to address the following challenges:

- BT's continued need to offer a full range of CPE and associated equipment that would be located at a subscriber's premise delivering scalable, cost-effective, high-performance network connectivity, such as broadband access for high-speed data and video services to small, medium and large enterprises.
- Like most incumbent telcos, BT used automated order fulfillment systems to reduce the time and costs for service deployment. These traditional automated order fulfillment systems had so far met business needs and expectations to deliver BT's product offerings. But over the years, BT had extended the CSS solution by many tens of thousands of order processes, in many instances custom developed, to deal with different product types as well as the need to configure a very large variety of CPE. A typical CPE order can range from a single order line to hundreds. To manage such a large, diverse and constantly changing portfolio of products, a new innovative approach was needed that would transform BT's capability to execute provisioning tasks interactively and allocate CPE settings dynamically based on the unique needs of each type of CPE.
- The new solution had to provide the ability to construct, change and deploy an order process in real-time instead of a design time which required IT specialist skills and effort.

The project undertaken to address this is called the CPE Transformation Program. The problem space was constrained by numerous business requirements. The solution had to support any number of product types and associated processes. It had to provide an architecture that would mean a reduction in operational and capital costs. It had to maintain certain cherished features from the key legacy systems, yet provide sufficient sophistication to support wide-scale automation. The outcome had to be a quantum step forward in capability – a solution befitting a Telco in the 21st Century.

The primary objectives of this CPE Transformation Program can be summarised as:

³ 'Oracle Inventory' – Oracle Communications Service and Subscriber Management (S&SM) is part of the solution. Since S&SM is the predecessor to Oracle's latest inventory system called Oracle Communications Unified Inventory Management (UIM), 'Oracle Inventory' will be used for the rest of this paper to represent these two products.

- Deliver on customer centricity through platform simplification
- Create strategic fulfillment capability by replacing CSS
- Rationalise and optimise practices constrained by CSS system capabilities to improve customer service & reduce costs
- Provide operational flexibility to support voice, data and converged without the need for customization.

KEY SUCCESS FACTORS

At the start of the CPE Transformation Program, it was agreed that the project scope would need to support:

- Migrate CSS functionality to a new CPE service fulfillment system based on Oracle Siebel, Order & Service Management and Oracle Inventory.
- Oracle products were expected to conform to BT's 70:20:10 rule (70% off-the-shelf functionality, 20% configuration and 10% customisation)
- Capabilities Oracle products were expected to deliver and meet
 - Integrated Customer Ordering, Supply Chain Management, Billing and Service Fulfillment through centralised order orchestration
 - Create, assign and manage all relevant activities and order processes to support the delivery of entire CPE portfolio
 - Create and implement new activities and order processes without system changes
 - Provide ability to construct, change and deploy an order process in real-time
 - Support introduction of new tasks into an existing in-flight order process
 - Ability to allocate tasks to manual queues on order data basis and ability to define second and third line support queues as well as to be able to amend these without changes to OSM
 - Support Dominant Product⁴ identification by Inventory, data driven by BT's Product Master File

ADOPTING A STRATEGIC APPROACH

There were requirements that entailed a very dynamic and interactive approach to order process management. In particular, the solution had to support order process creation as data in the Inventory system, which would be carried out by Network Operational Users. This method enables a huge degree of flexibility. The Users hence needed to be able to perform the following actions:

- Tasks to be added, removed or sequentially moved in an order process
- Tasks dependencies to be introduced, removed or amended
- Jeopardy & Failure dates amended

⁴ Dominant Product – a technique developed by BT whereby the key product is identified in an order (which may contain hundreds if not thousands of order lines) thereby aiding order processing. For example, an order for a switch will include not only the switch, but all the racks, shelves, nuts and bolts and various other components. But the main item is the switch itself, and it is this that is referred to as the dominant product.

And all without changes to the core order process on OSM. We defined a strategy on how the objectives and requirements were met using a single generic order process created on OSM – based on a multi instance task – used for all orders and products.

The target architecture picture below describes the solution architecture adopted by BT (as seen in Figure 1). The primary Oracle products included Siebel CRM for order capture, OSM for order orchestration and decomposition, Oracle Inventory for logical tasks and resource management and BEA WebLogic for integration. This architecture had to meet the long and complex list of requirements, and to do so with a minimum of customisation.

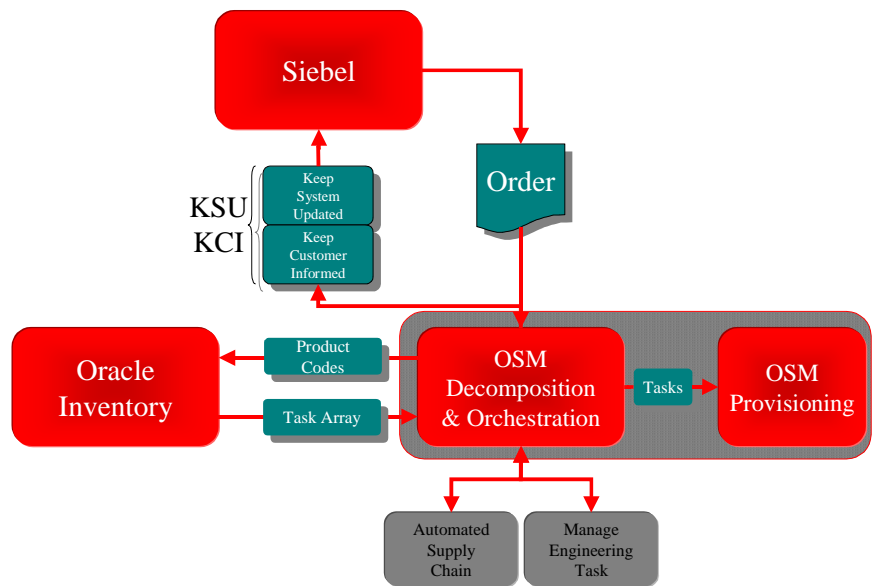


Figure 1 - Overall architecture. Automated Supply Chain (ASC) and Manage Engineering Task (MET) are BT applications.

Whilst these may have been an attractive proposition for a Systems Integrator, the joint team saw a radically different and altogether more innovative approach which resulted in just a single order process on OSM that would deal with all products, no matter how many or how complex.

Starting at Siebel, a customer request for a CPE product is transformed into a Siebel order. This may be a simple order with only one order line, or it could be a complex order with thousands of order lines. On CSS there were thousands of order processes, each designed to deal with a particular product. The most direct approach for the BT and Oracle design team would have been to replicate these order processes onto OSM (not forgetting there are over 40,000 of them). Whilst these may have been an attractive proposition for a Systems Integrator, the joint team saw a radically different and altogether more innovative approach which resulted in just a single order process on OSM that would deal with all products, no matter how many or how complex.

How could a single order process be applicable to all products? The answer lies in the fact that OSM can be data-driven together with View Framework⁵ rules

⁵ OSM's View Framework is a configurable rule driven engine to support real time look up from internal or external source. It is used in Web Client and central fulfillment.

interpretation. That is, OSM has the flexibility to change its behaviour based on the data it receives – in this case from Oracle Inventory. As such, a single generic order process, based on a multi-instance task, can generate any number of order processes based on the data it receives from Oracle Inventory.

Oracle Inventory provides the ability to define a ‘task palette’ using Custom Object Entity type⁶ that amounts to a collection of tasks and associated data that are fully reusable. When a product or service is defined in Oracle Inventory, the instructions for how this product or service should be implemented is included using the generic and reusable tasks. Note that the ‘process’ is not a typical order process as such, although it could be viewed as a ‘logical order process’ (LOP) defined as a service configuration specification. It is really a ‘cookbook’ or a set of instructions that effectively informs OSM how to deploy a particular product or service. The picture below shows a sample of LOP for provisioning a Micro Router being constructed interactively using a set of pre-defined task palettes (as shown in Figure 2).

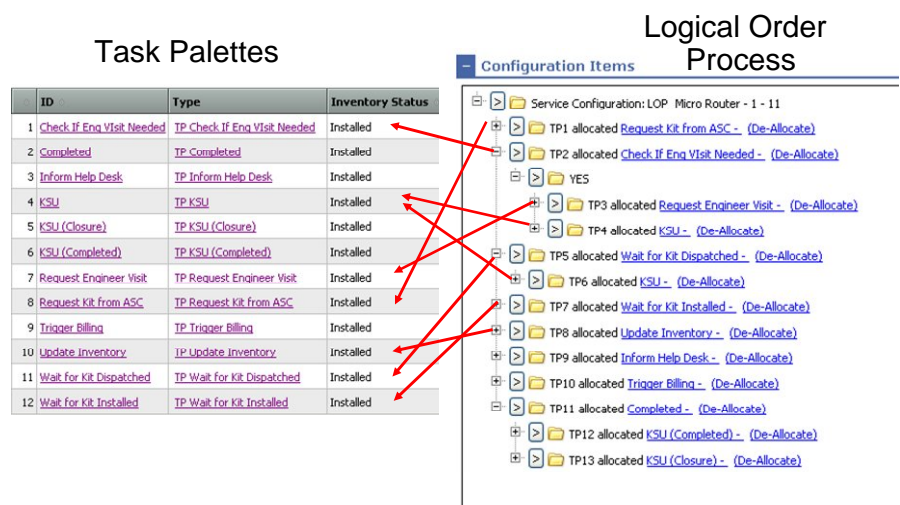


Figure 2 - Creating 'Logical Order Processes' (LOP) to map re-usable Task Palettes in Oracle Inventory

This LOP is stored in Oracle Inventory as a series of cells (or custom objects) in an array for easy access and update, as shown in Figure 3.

⁶ This is a powerful extensibility pattern and framework that will enable Oracle and our customers to create solutions quickly.

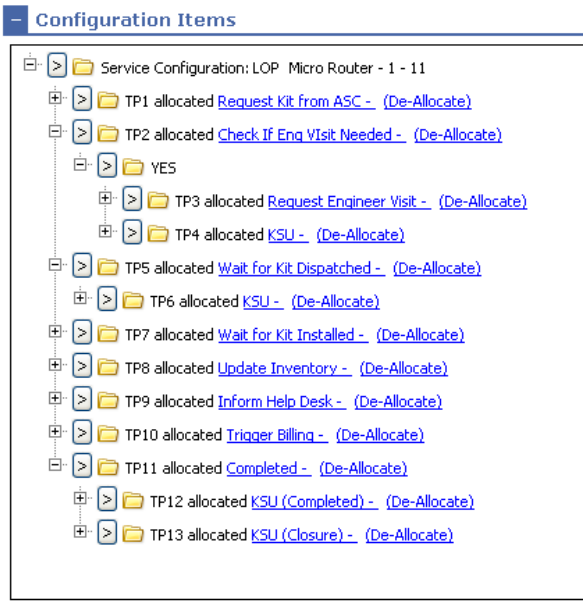


Figure 3 - LOP as a sequence of cells in an array

Once OSM receives the order from Siebel it decomposes the order so that the individual product codes can be identified. These product codes are then sent to Oracle Inventory, where the dominant product is automatically determined and the associated LOP and then sent back to OSM. On receiving the LOP, the generic, multi-instance task in OSM transforms and generates the associated order process so that the order can be processed. This is shown in Figure 4.

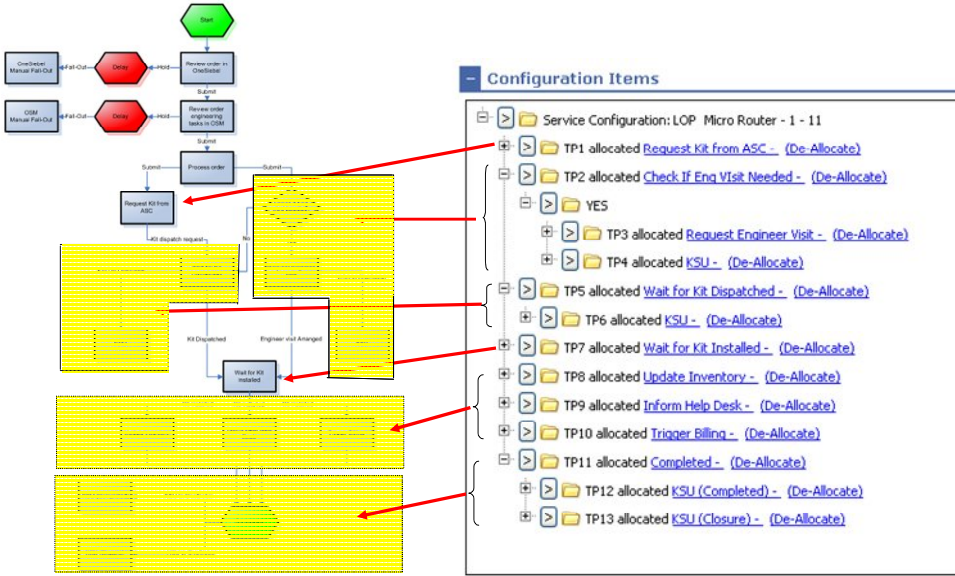


Figure 4 - Generating the required order process via the LOP and the Generic Task in OSM

The instantiation of the multi instance task according to the data in the array, together with View Framework rules interpretation of the dependency and sequence information in the array allows OSM to behave as if it had a number of fixed processes. Once the complete order process has been generated, OSM fulfills the whole delivery process, interacting with Oracle Inventory, ACS (identifies suppliers for key components and arranges for them to be shipped to the customer) and MET (organises field engineers) for example. In addition, one of the requirements of the BT Global Services operations was to be able to view tasks that although not yet active, were tasks that they nonetheless would have to work on at some point. This enabled them to plan their work and ensure that any dependencies were identified early in the process. The solution highlights the active tasks, but still shows all tasks, with non-active tasks essentially 'greyed-out'.

RESULT

As compared with BTs 70:20:10 rule, Oracle achieved 100:0:0! It is one hundred percent COTS without any customisation.

This demonstrated the inherent power of Oracle OSM in particular.

Operational deployment, in the field, is generating revenue and cutting operating costs. BT and Oracle continue to work together to innovate and solve real business problems. As the result, the project has achieved outstanding results:

- Migration of CSS functionality to Oracle Siebel CRM, OSM and Oracle Inventory as designed and required by operations - dominant product and the ability to create order processes 'on the fly'
- Provide high levels of flexibility and scalability for all interactions between Oracle Siebel CRM, OSM and Oracle Inventory
- As compared with BTs 70:20:10 rule, Oracle achieved 100:0:0! It is one hundred percent COTS without any customisation. This demonstrated the inherent power of Oracle OSM in particular.
- A full deployment of this solution was targeted and achieved by the end of 2008.

CONCLUSION

Many CSPs still can deploy new communication products using their current order fulfillment solutions. BT is successfully transforming from its traditional solution to a highly responsive, scalable, and reliable service fulfillment solution to configure millions of CPE with no need to deal with thousands of order processes.

The approach adopted by the BT CPE team has become something of a role model at BT where a data-driven methodology sits well in an organisation that offers many products and uses many business processes to manage them.

The approach adopted by the BT CPE team has become something of a role model at BT where a data-driven methodology sits well in an organisation that offers many products and uses many business processes to manage them.

The success of this project is enabling BT to reach its goal of Number 1 Telco, achieve the platform simplification, rationalise and optimise practices constrained by legacy system capabilities in order to improve customer service & reduce costs.

To achieve the platform simplification through the 'Oracle First' program:

- Long-term strategic partnership between BT and Oracle
- Enterprise Wide License (EWL) across BT for all Oracle products
- Using Oracle product suite to achieve business objectives

- Oracle COTS strategy aligns with BT strategy

ABOUT BRITISH TELECOMMUNICATIONS (BT GROUP)

BT Group is a major player in the telecommunications arena – globally. Revenues have averaged around \$150 billion per annum. It employs around 120,000 people world-wide.

BT Group is organised into the following business divisions:

- BT Retail (BTR): Retail telecoms services to consumers
- BT Wholesale (BTW): Wholesale telecoms core trunk network
- BT Openreach: fenced-off wholesale division which controls the 'last mile', tasked with ensuring that all rival operators have equality of access to BT's own local network
- BT Global Services (BTGS): Business services and solutions
- Group operations: handles security, research and development, and other functions for BT Group Plc such as legal services
- BT Operate took responsibility from BT Wholesale for the roll-out and maintenance of the group's new IP based fixed-line network, known as 21st Century Network (21CN).
- BT Design is formed by a group of IT designers from BT Retail, BT Wholesale, BT Global Services and OneIT to design services on the 21CN.



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