



OSS/BSS Product Configurations Challenges

¹Isha Rahul Wargad, ²Satya Swetha Kalapureddy, ³Prof. Shital Pawar

¹Student BTech, ²Consultant, ³Professor

¹Electronics and Telecommunications Department,

¹Vishwakarma Institute of Technology, Pune, India

Abstract: Service providers must upgrade their operations support system (OSS) and business support system as the telecommunications industry changes and new technologies like LTE, LTE-A, and 5G networks gain popularity. The performance of an organization's needs for service delivery, fulfillment, and business information depends heavily on OSS and BSS. The setting up of a solution (hardware or software) is known as configuration. Any solution will need to be configured to some extent before being used, which in our reality involves installing operating systems and databases. System integration should assist communication service providers in cutting costs on their OSS/BSS system while also enhancing the overall service delivery and the quality of the client experience.

Index Terms - OSS/BSS, Mediation, Billing, Accounting, Tariff Plan, Product Catalogue.

I. OBJECTIVES

This paper explains the concept and challenges faced by Communication Service Provider in configuration of new product and tariff plan in OSS/BSS system and to identify suitable solution to reduce time to market.

II. DESIGN

This paper is conceptual in nature wherein qualitative method has been used to substantiate the significant issues faced by Communication Service Provider in configuration of new product and tariff plan in OSS/BSS system. An attempt is made to explore the possible solutions to handle this challenge in order to make certain vital observations to lay down conclusion.

III. INTRODUCTION

3.1 OSS

Communications service providers employ computer systems known as operations support systems or operational support systems, also referred to as OSS. The term "OSS" is most usually used to refer to "network systems" supporting telecom network-specific tasks such network inventory maintenance, service delivery, component configuration, and fault management. Business systems dealing with clients, supporting systems including taking orders, processing invoices, and collecting payments are often referred to as the complimentary term business support system, or BSS, which is a more recent terminology. The application areas covered by OSS are Network Management system, service delivery, service fulfillment and service assurance.

3.2 BSS

The term business support system "BSS" refers to all of the telecom software programs used to support customers. The term refers to software that facilitates order and ordered activation, marketing and sales customer relationship management, billing and charging, and product design and management. Operational support system (OSS), a term used in connection with BSS contracts, relates to network-facing solutions. The terms "OSS/BSS" are frequently used, but in reality the two sets of solutions are closely related and increasingly need to work together. The split of systems into the BSS and OSS layers is becoming more arbitrary, despite the fact that there is general agreement that the BSS covers some types of software situated between the OSS and BSS. However, originally, this process was divided into two independent departments: BSS was handled by IT, whereas OSS was handled by networks.

IV. FRAMEWORK OSS/BSS

4.1 Introduction

In the past, service providers in the telecom sector provided their clients with end-to-end services. As a result, a single company has control over the full value chain, if necessary through establishing interconnection agreements with other service providers. Service providers must, however, adapt to clients' growing expectations for improved customer service in a liberalized market in order to fend off competition. Consequently, they have been expanding their markets beyond their own borders and their network of commercial contacts.

4.2 The goal of the business framework

Despite the fact that service providers operate in quite diverse competitive and regulatory situations, they have a number of things in common:

- Significantly relies on effective information and communication network management to compete.
- They use a service management strategy to manage their networks and operations.
- Shifting to a more comprehensive approach to process management that was created with the needs of the client in mind.
- Automating their network management, customer support, and customer care processes.
- New BSS/OSS must be integrated with legacy systems.
- Concentrating on providing data services.
- Confluence of fixed and mobile.
- Distributing multimedia content.
- Putting a priority on overall service performance, including client satisfaction.
- Integrating with both new and existing technologies.
- Putting more emphasis on a functional approach than a construct one that integrates technologies from several providers.

4.3 Frameworks

4.3.1 (NGOSS) Framework

The Tele Management Forum (TMF) oversees a work programme for new generation operations software and systems. TMF is a nonprofit association with more than 340 member companies worldwide. The TMF's vision is to advance the existing technologies and solutions to become widely acknowledged as the leader and facilitator for automating operational management and business processes throughout the global telecommunications industry and related supply chains.

The NGOSS program's goal is to provide a framework that will aid in the creation of future generation OSS/BSS solutions and serve as a depository for documentation, patterns, models, and code to support these advancements. Framework in this context refers to an architecture and technique that can support business systems and the development of solutions based on OSS and BSS components. The objective of NGOSS is to speed the development of OSS/BSS systems that are adaptable, affordable, and suit business requirements in an internet-enabled economy.

4.3.2 Elements of NGOSS

- A framework for business processes is the improved telecom operations map (eTOM).
- The shared information data SID model offers a thorough information/data model that may be customized for the requirements of a specific organization.
- The technology-free architecture The TNA and contact interface are the parts that make up the NGOSS integrated framework's core. Through technical advancements, TNA is architecture that is sustainable. The contract interface specifies APIs for connecting several suppliers' architectural products together.
- The NGOSS compliant element offers a number of tests for eTOM, SID, TNA, and contract interface component compliance. Vendors can pass these tests to become certified as adhering to one or more NGOSS criteria.

4.3.3 Business Process Framework(eTOM)

The eTOM is a business constructive process that a service provider will utilize as a reference framework or model to characterize all of their business activities. A service provider business model is not what it is. In other words, it doesn't address the strategic issues or questions of what market segments a service provider should serve, who their ideal customer should be, or what their goal and mission are, etc. One element of the strategic business model and strategies for a service provider is a business process framework.

Since the eTOM framework seeks to characterize process elements and business activities so that they can later be combined in a variety of ways to implement end-to-end business processes that deliver value to the customer and this service provider, it is better referred to as a business process framework than a business process model.

The eTOM development has the ability to advance in areas like further lower level process segmentation and flows, applications in certain business domains, guidance and aid in utilizing the eTOM framework, cost and performance concerns related to the processes, etc. In addition, on-going industry feedback and its connection to the larger NGOSS initiative can be used to direct future objectives for ongoing development. It should be emphasized that creating a complete process framework requires a substantial amount of work, and it must be done in stages throughout time depending on member process priorities and resource availability.

V. BILLING MEDIATION

Platforms for billing mediation derive their name from the way they mediate disputes between several other systems. In a typical telephone business, network components like telephone switches are located in the upstream systems, while accounting, auditing, achieving, and bill production tasks are carried out by the downstream systems. The downstream systems only provide data in a few number of formats, thus the mediation system gathers, organizes, and prepares data for consumption by them.

5.1 Software Mediation Activities

- Archive and collection
- CDR normalization
- encoding and decoding
- Filtering
- Validation
- Conversion

- Record for enhancement
- Detecting duplicate records
- Buffering
- Cloning
- Sorting
- Creation of the header and trailer
- Distribution down the chain
- Sending out an alarm
- Reporting and auditing
- Reconciliation
- Configuration of reference data
- Service provisioning for the subscription

VI. BILLING SYSTEM

The Post Paid Billing is a process of converting event detail records pertaining to various services subscribed by the subscribers into equivalent usage amounts and further aggregation of usage charges, recurring charge on an account by account basis. It also applies discounts, taxes and adjustments.

Finally, The Billing software bills customer accounts according to the billing cycle of the account. When an Billing Account becomes billable, the Billing Engine accesses required information related to that account and generates an invoice.

Billing is a two stage process which consists of [I] Rating & [II] Invoicing.

[I] Rating

The mediated Event Detail Records (EDR's) are sent to the billing system in the unified format specified by the billing system. The mediation system is configured to convert the EDR's pulled from different network elements into a unified format as specified by the Billing software.

Rating activity involves following steps:

- Identification of the Billing Account Number from the customer database based on the information available from the event. The information used from EDR's for example can be calling the party MSISDN number from CDR or user id from IPDR etc.
- Identification of the price to be applied to an event. Based on the identified Billing Account number, the tariff subscribed by the customer and can identified and finally the price associated with the tariff can be identified (Example 1 paisa/Sec or 1 cent/Sec or 10 paisa/MB)
- Costing - Computation of value for every Event Data Record. yd bostinge In short rating can be remembered as a process of converting event into equivalent usage amount by referring to the applicable price associated with the tariff plan subscribed by the customer.

[II] Invoicing

The actions carried out by Invoicing engine consist of

- Summing up of usage value for a particular Billing Account service wise from rated EDR's for the period of the Billing Cycle. For example, summing up usage of voice calls, sms, data usage for a GSM customer.
- Application of recurring Charges. This could include charges like monthly plan charges, fixed monthly charges per song configured in Ring Back Tone or Caller Tune service etc.
- Application of Installation charges and Deposit amount. This step is optional and would be applicable only for the first invoice of the customer and if the same is billable i.e., this amount is not collected from the subscriber at the time when customer has applied for new service. In some cases, a separate bill called an initiation bill can be also generated.
- Application of Discounts. Discounts applicable at the time of Invoicing are in this step. applied
- Calculation of Taxes. Taxes applicable as per the law of the land are Example Service Tax.
- Application of Credit and Debit adjustments. Credits and debits related to paid amount for last invoice or outstanding amount of last invoice etc.

VII. PRODUCT CONFIGURATION CHALLENGES

With a growing demand for smartphones and other data-hungry devices in the digital era, offering customers the right products at the right time remains a challenge for CSPs. It can be difficult for CSPs to create, manage, and monetize data offers efficiently.

Despite having a variety of products, many fail to respond to the growing needs of customers in an ever-changing marketplace due to unconsolidated Business Support Systems (BSS), a poorly integrated order management system, and multiple product catalogs. While customers clearly indicate that quality, reliability, and consistent service are keys to retention, operators' BSS stacks fail to anticipate customer needs to proactively deliver personalized offers.

The root of the problem is a lack of ability to deliver on customer demands for bundled services and siloed product offerings.

In the telecom business, the situation also used to be much simpler then it is today. Nowadays, product offers and definitions consist of many different elements including price, target group, distribution channel and offer validity time. And since an operator often has thousands of products created, managed and offered by multiple departments, managing the product portfolio may become very

complex and ineffective. This drawback grows even greater, as product lifetimes get shorter (e.g. promotions / personalized prices) and the number of product variations keeps growing.

CHALLENGE 1 – DIFFICULTIES IN MANAGING MULTIPLE SYSTEMS

The operators that have existed on the market for many years may have products defined and maintained in multiple systems from different vendors. One billing system handles mobile services, another deals with fixed line telephony services, and yet another is for cable TV services. All these systems need to support sales-related applications such as CRM, a self care portal and a point-of-sale system. A customer service agent should use the same CRM applications for mobile, fixed and cable TV services, so the sales-related applications need to

be able to use all the product data that has been scattered across many systems, and present this data in a unified format.

Developing a telecom operator's business (adding new business models, entering new regions, involving in mergers & acquisitions) calls for the addition of new systems, databases, terminologies, data structures and new levels of information quality. As a result, the operator has multiple data models for products managed in various systems. The old BSS system that handles fixed line services may not be as flexible as the new system that handles mobile service offerings.

If the old and new systems are using different terminologies to describe the same things, systems cease to 'speak the same language'. In turn, the people working with product data (e.g. product managers and call center agents), who need to get an overview of product status, face difficulties in obtaining the information they want. This increases the amount of time consuming manual work, entailing more costs and errors in the service delivery process. Bringing new services into the market using a platform with no common language can be very challenging, and may give an edge to competitors. Operators cannot evaluate their current business performance well, if the underlying system does not provide a consistent, single view of the situation.

CHALLENGE 2 – COMPLEXITY OF NEW PRODUCT DEFINITIONS

Data consistency is not the only challenge. When a product manager is designing new products and offerings, he should be able to design them effectively, without needing to repeat the same work multiple times using various applications. The same should be possible during the implementation of the product.

Having many parallel systems for product management can bring various disadvantages and Duplicated work. Depending on the system, the data model may be different so one data structure cannot be used for multiple products. This entails product managers' additional effort at product definition stage and disables product inheritance. All of this means a lot of time is spent making similar configurations instead of re-using existing ones and n Complicated maintenance of product data. Managing existing product data and reconciliation of the data between products and systems becomes complex, leading to increased effort on the side of service providers' staff and Lack of consistent product performance data. It may be difficult to get an overview about the products defined in different systems.

To analyze the overall product portfolio, the product manager may need to browse data in multiple systems, which takes more time. All these disadvantages are slowing down the operator's business. This becomes a severe drawback, damaging the operator's ability to respond swiftly to changing market conditions. Apart from time to market on new product launches, operators need to think about product life cycles that are getting shorter nowadays. This calls for effective management of the product retirement strategy, in order to keep maintenance and retiring costs under control. This is also a relatively new challenge. Back when fixed-line voice telephony was almost the only type of service, retirement was not essential, as the same service could have been offered for years.

CHALLENGE 3 – GEOPARDIZED CUSTOMER EXPERIENCE

The problems occurring from the complex definition and management of products won't only affect the product management department. These problems can eventually damage the customer experience too. If the product data is inconsistent, the order management process may encounter difficulties, for example in situations where incorrect product data (e.g. wrong price) would be presented to the customer. Additional difficulties may occur from the service fulfillment process. For example, the service activation component of an operator's BSS platform may obtain wrong data (e.g. in case multiple database are used) so the wrong product is activated as a result. This entails dissatisfaction on the end customer's side. The damaged customer experience may not only increase churn rate, but also customer service costs.

To conclude, operators can no longer afford fragmented and inconsistent product catalogs. They are too time consuming to manage, which is a huge burden for operators struggling to optimize their business processes. A centralized product catalog also shortens the time-to-market, which entails cost savings (products are designed with less manual effort) and revenue loss elimination (delayed product launches result in lack of revenues from the products). It also enables definition of new products and management of the product life cycle using a single system. The system services multiple stakeholders of the operator (e.g. product managers, sales and marketing), while using a single, consistent data model for product data standardization

VIII. THEORETICAL FRAMEWORK

The ideal solution is to have a single centralized product catalog. A centralized product catalog helps seize revenue-generating opportunities, deliver unparalleled Quality of Experience (QoE), reduce time-to-market (TTM), retain a profitable subscriber base, reduce churn, and improve brand loyalty.

A central product management should cover offer and product specification, product relationship definition, and a possibility to specify which products are exclusive or sold only as a component of a bigger package. It should also provide tools for defining target customer types, offer locations and many other parameters. Central product management should be an integral part of the BSS architecture, fully integrated with its other components.

Following Product offer creation approach is proposed :-

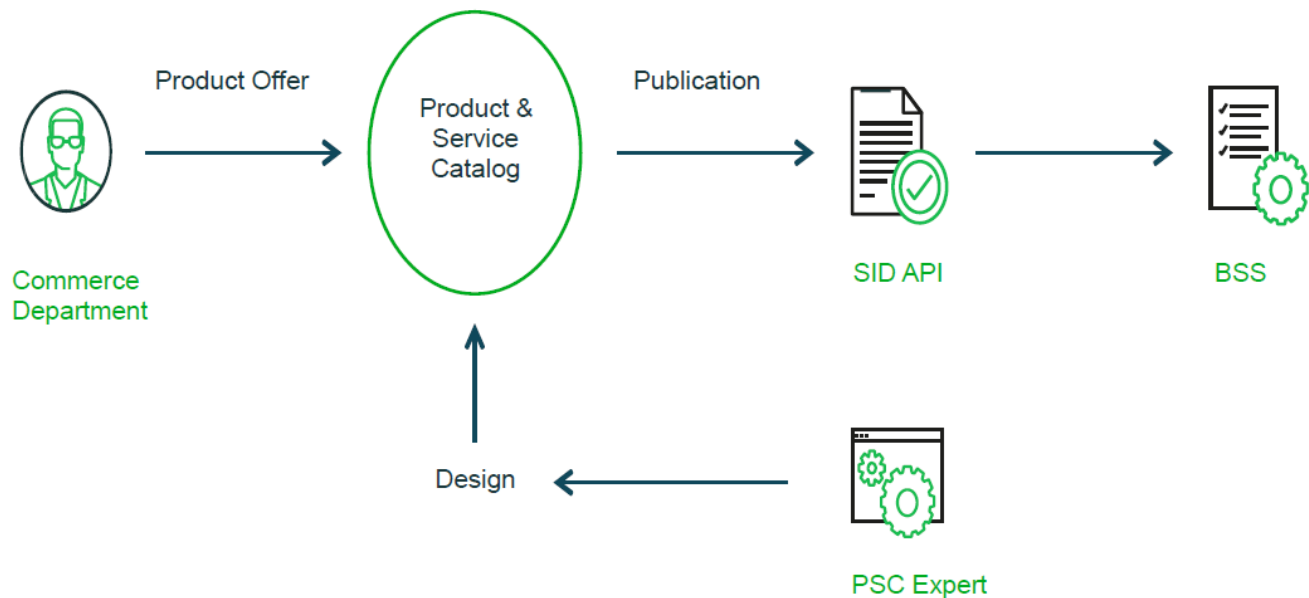


Figure 1.0 Product offer creation approach

The commercial department normally launches a new tariff plan or product. This product is proposed to be configured in the proposed central product management module by the product catalogue expert configuration team. Once the new product is configured in the Product & Service Catalogue, this configuration can be pushed in other required OSS/BSS modules.

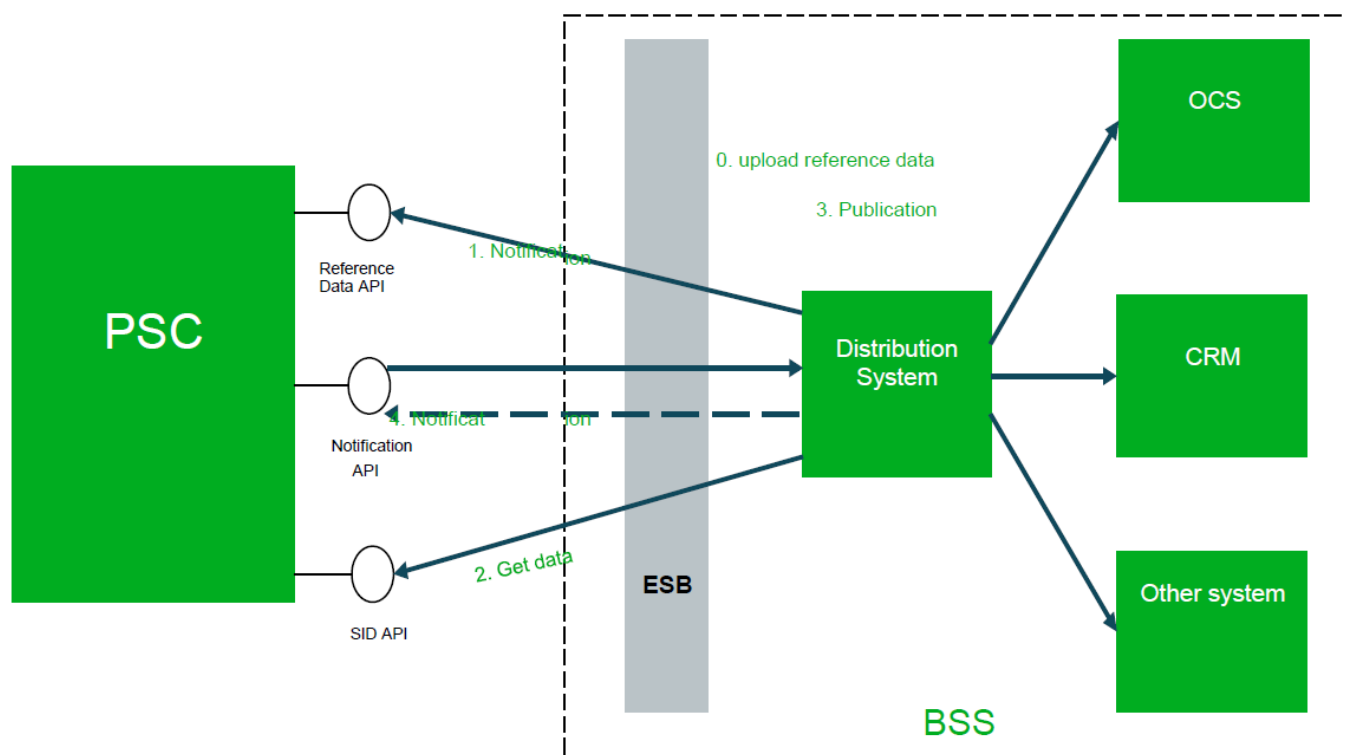


Figure 2.0 Integration of Product Catalogue with OSS/BSS system

As seen from the above diagram once the Product catalogue expert configures in centralized product catalogue module, the distribution module shall identify newly configured product or price plan and pull the configuration to Distribution system. The distribution system shall distribute the configuration to required OSS/BSS modules like Customer Relationship Management (CRM), Billing, Online Charging System, OSS etc.

This shall help in ensuring that end to end configurations are done without any gap. Further time required is less as experts are not required to do individual configuration on all OSS/BSS modules. This shall reduce time to market and increase accuracy and customer satisfaction.

IX. CONCLUSION

It can be concluded that the Centralized Product catalogue can facilitate: reduced risk of inaccurate prices and other data inconsistencies, fewer order drop-outs and fewer service activation errors, Personalized products and better up-selling and cross-selling opportunities.

Product data available and manageable from a single location can accelerates the operator's business. It shall speed up product management, improves customer experience, and increases visibility of the business performance.

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