BSS Architecture

ARVE MEISINGSET

Arve Meisingset is Senior Research Scientist in Telenor Group Business Development and Research

This paper presents a proposed systems plan for Business Support Systems (BSS) of a telecom operator. The plan has been used in Merger and Acquisition projects. However, Telenor has not yet developed as detailed plans for BSS as for the OSS domain, see a separate paper on OSS Architecture. The thinking behind the BSS Architecture is much the same as for the OSS Architecture.

Terminology

BSS stands for Business Support Systems. In this paper, the expression is used to denote computer systems that are used by a telecom operating company to manage its customer relations, services and billing. There is no standardised terminology for the various business domains of a telecom operator, so the scope of BSS in this paper corresponds to what is described in the paper on OSS Architecture.

OpCo stands for Operation Company. The Telenor corporation consists of several OpCos. There may be one or more OpCos in one country. This also complies with the way ITU (the International Telecommunication Union) assigns ITU Carrier Codes.

Methodology

For BSS, as for OSS, we discourage the use of the TMF results: eTOM, SID and TAM. See the paper on OSS Architecture.

Telenor proposes a set of actual systems. Each system is a set of data that are enforced as a consistent whole. Hence, integration within a system is very different from interoperations between systems, and require different solutions.

In its RfQs Telenor uses the following sections for the requirements of each system: Scope, System integration, Administrative domains, Data and data structures, Functions, and Interfaces. In this paper, we will only cover data of the fourth item, Data and data structures. Data is at the heart of any system. If you know its data, you know very much; if you do not know the data, you hardly know anything.

Systems Plan

Within the BSS domain, we have identified a need for fifteen different kinds of systems for a telecom mobile operator. Most of the systems represent a vertical partitioning of data. The architecture is idealistic, but takes reality into consideration.

However, it is important to note that the systems plan is a plan for systems within a telecom operator. It is not a portfolio plan for a software package vendor. How a vendor chooses to organise its packages is a totally different issue from how a telecom operator wants to organise its systems. These two very different topics should never be confused, but unfortunately they often are, when a vendor presents its solution.

Each system is identified as shown in the text that follows.

The Customer-Order-Billing management system may manage the following data subjects:

- Customers and contact details
- Account and account types
- Multiple roles of customers and accounts
- Hierarchies for complex customer organizations
- Product instances and product types
- Payment methods, eg. pre-paid, post-paid, pay in advance, credit card, etc.
- Providers, ie. other operators and content providers
- Price Plans
- Credit Class
- Customer history and contact logs
- Bills
- Rated usage data
- Account balances
- Contracts/subscriptions and Deals
- Customer Orders

The reader should note that billing requires much the same data as held in customer relationship management. The latter may be considered as a repository for the billing. And the order management may be a transport vehicle between the two. And a bill may be considered as a special case of a generic order. Finally, you may want to see what orders are active for a relevant customer. All these considerations indicate that there are great opportunities and savings in integrating customer, order and billing data into one system.

ISSN 0085-7130 ©Telenor ASA 2009

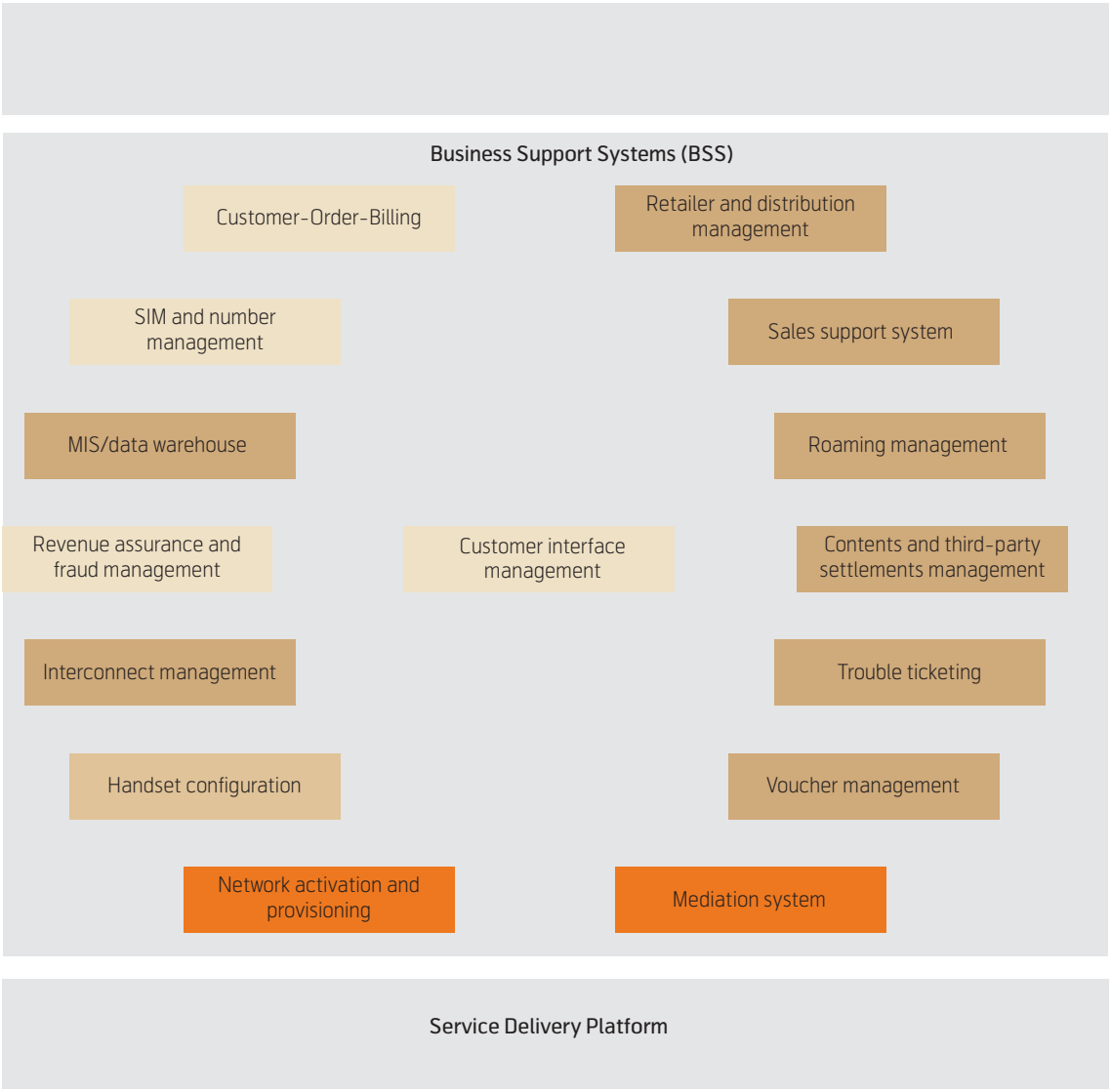

Figure 1 Systems plan

SIM and number management system may manage the following data subjects:

- Numbers and number related information like number types, number pools and vanity numbers
- Number series for traffic areas
- Large account telephone number series and customer allocations
- SIM cards, SIM card status and logistics

SIM cards and numbers are considered to be resources that may be managed independently from customer-order-billing, just like network resources are managed separately within the Operation Support Systems (OSS) domain.

The MIS/data warehouse system may manage the following data subjects:

- All kind of analysis on customer categorisation, experience and behaviour
- Financial analysis

The purpose of Revenue assurance and fraud management is to secure that all revenues are captured without delay. Revenue assurance spans across the whole value chain, but can also be broken down into the individual processes or systems.

The Interconnect management system manages the following data subjects:

- Other operators
- Number plans Destinations per Operation
- Traffic areas within regions
- Agreements
- Point of Interconnect
- Product hierarchies
- Price lists and multicurrency support
- Taxes
- Discounts
- Traffic data
- Billing data
- History

ISSN 0085-7130 ©Telenor ASA 2009

The Handset management system manages the following data subjects:
- Handset service support
- Handset configuration

The Network activation and provisioning may manage the following data subjects:
- Product and product bundles
- Network elements and service platforms
- Mapping data related to network element and product types
- Operation steps
- Interfaces
- Logs

The Customer interface management may need access to data from most BSS systems, and maybe from OSS, as well. An umbrella system may give access to multiple systems dealing with one customer.

The Customer interface management may support the following means of communication: Telephone, SMS, call centres and dealers, mail, Internet chat, Web.

The Retailer and distribution management system may manage the following data subjects:
- Retailers, Distributors and Vendors
- Resource stock of each, and need for refilling
- Resource orders and deliveries
- Commissions and Agreements
- Business rules for commissioning
- Copies of customer order transactions
- Summaries of sales

The Retailer and distribution management system may be considered as a part of the Customer-Order-Billing management system, or as a horizontal partition of this, as the data classes may be defined to be the same.

The Sales support system may manage the following data subjects:
- Internal sales force
- Customer contacts
- Phone sales
- Channel management
- Campaign management
- Corporate sales
- Customer incentives
- Loyalty programmes
- Sales leads

Campaign management may be defined as a part of Customer-Order-Billing management.

The Roaming management system may manage the following data subjects:
- Contact details for roaming partners
- Inbound Roaming Products
- Rated roamed usage data

The Roaming management system exports and imports TAP files containing CDRs for roaming. TAP import covers outbound roaming where the TAP files contain CDRs for own customers' usage abroad with roaming partners. TAP exports cover inbound roamers, foreign customers visiting the local network. All files are normally sent and received through a data clearinghouse. The TAP files should cover all normal roaming usage. High Usage Reports (HUR) should be sent to all roaming partners at agreed frequencies and formats.

The Roaming management system shall not manage customers other than the roaming partners.

Contents and third-party settlement management:
- Terminal access data
- Configuration data

The Trouble Ticketing system may manage the following data subjects:
- Fault messages
- Sender and receiver
- Originator and responsible unit
- Timing and expected correction time
- Status
- Consequences
- History

Trouble Ticketing for BSS will cover customer reported faults. Trouble Ticketing for BSS will in some way have to interoperate with Trouble Ticketing for OSS, or preferably be integrated into one system. Also, Trouble Ticketing may be covered by a generic order management function. Note that network orders and customer orders will need to handle very different data classes.

The Voucher management system may manage the following data subjects:
- Vouchers in circulation
- Voucher state, eg. used/not used

The Mediation device may manage the following data subjects:
- Call handling data for real-time events
- Usage Data (EDRs/CDRs) for postpaid
- Logs

Note that Mediation typically receives data from the Service platform and communicates the data to billing.

Future Work

Further work items related to the BSS Reference Architecture area may include:

- Validation of the systems plan
- Development of a BSS interworking plan
- Considering addition of a separate Customer experience management system
- Coordination of the architecture with OSS, ERP and Service platforms
- Providing references to standards and relevant literature for each system domain
- Evaluation of the reference architecture by the OpCos
- Evaluation of the reference architecture against the solutions available from the BSS vendor community
- Studying BSS Architecture over Service platforms, such as IMS
- Studying low cost BSS solutions
- Studying evolution towards an Internet Service Provider
- Studying IT portfolio for alternative business models, such as advertisement billing
- Studying relationship between BSS and IT-management (similarities and differences),
- Development of more detailed interworking plan for selected areas, eg. specifying data mastering, flow directions, interactions, and data subjects
- Studying of data structures for selected system domains within BSS
- Developing Requests for information (RfIs) for selected system domains
- Studying horizontal partitioning in selected system domains
- Establishing target system plan for each OpCo
- Establishing evolution plan (transition from current systems and interfaces to planned systems and interfaces) for one of more OpCos

Reference

1 Meisingset, A. Introduction to Information Systems Architecture. *Telektronikk*, 94 (1), 3-11, 1998.

For a presentation of Arve Meisingset, please turn to page 80.

ISSN 0085-7130 ©Telenor ASA 2009