



> Semantic Web Use Cases and Case Studies

Use Case: B2B Integration with Semantic Mediation

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General Description

Introduction

The number of companies in the Telecommunications industry has increased rapidly in recent years. The industry has been transformed by changes in regulation and the emergence of the Internet and mobile technologies. The days of one organisation providing end-to-end services to customers are gone. Supply chains now involve many players of differing size and function. Companies now need to efficiently provide service fulfilment, assurance and billing across organisational boundaries. The problem is exacerbated by today's fast moving market and dynamic Business-to-Business (B2B) relationships. Getting a new service to market quickly involves close integration of data with existing and new partners. The integration of heterogeneous Operational Support Systems (OSS) of all parties is crucial. However, this can be a costly process.

Forrester found average spending on integration by the top 3500 global companies was \$6.3 million and 31% was spent on integrating with external trading partners¹. In the telecommunications sector, costs of OSS integration can rise to 70% of the total OSS budget².

BT is adopting a Service Orientated Architecture (SOA) – which allows flexible and loose coupling of resources. This accelerates speed to market (organisational agility), reduces IT costs (through greater component reuse), improves the alignment of IT with the business, and allows enhanced customer service (improved responsiveness). SOA components can be exposed to business partners allowing chains of services to be developed across organisational boundaries.

As part of the DIP project⁴, BT has developed support for OSS integration using semantic descriptions of system interfaces and messages. This allows semi-automatic mediation between the data and process requirements of the interacting parties. The increased automation allows the benefits of the SOA approach to be more fully realized. The more automated approach reduces the time and cost involved in establishing and maintaining integration and allows a more flexible approach where partners and services can be dynamically discovered and integrated at (or at least very close to) run-time.

Semantic Mediation

Mediators are components that enable heterogeneous systems to interact. Their key role is to exploit data to create information for higher-level applications. Knowledge represented in an implementation-neutral manner can more readily be used and re-used across different applications. Mediators can be used to represent the interface requirements of a source implementation, and convert it into knowledge that can be used by a target interface.

Mediation can act on both data and processes. Data mediation is required when the semantic content of data required by systems is the same, but the syntactic representation is different. Process mediation is required when the semantic content of a process is shared, but when the messages or message exchange patterns differ.

Assurance Integration Use Case

BT Wholesale's B2B Gateway is made available to Internet Service Providers (ISP) to allow them to integrate their OSS with those of BT. Without such a system the ISP would either need to manually coordinate via a BT contact centre, or operate a system that is dedicated to communicating with BT.

The Gateway exposes a number of interfaces concerned with service fulfilment and assurance. These interfaces allow Internet Service Providers to manage faults and carry out diagnostics.

Currently, the process for granting access to the Gateway for a new service provider is lengthy and complex. Any approach that can reduce development time, improve the quality of development through enhanced understanding and as a result avoid significant problems during the testing and pilot phases will naturally save BT and its partners significant time and money.

The B2B Integration Platform

The B2B Integration Platform prototype has been developed to allow mediation to occur between the ISP systems and the B2B Gateway (figure 1). The prototype is based upon the execution environment of the Web Services Modeling Ontology – WSMX⁴.

In this use case, multiple ISP systems are interfacing with one Wholesale Provider (BT). However, the scenario could easily be expanded to include diversity at both ends where ISPs interact with multiple Wholesale Providers. Extra benefit is provided to the ISPs when there is more diversity, as it would enable them to more easily reconfigure their systems and processes to interact with alternative Wholesale Providers.

The prototype demonstrated how semantically-described interfaces can reduce the time and costs involved in integrating the heterogeneous OSS systems of partners. It provided the means to mediate between the data and process of the interfaces at the semantic level and applied those mediators to messages as they arrived or left. This approach allows the interfaces to be decoupled at design time and then flexibly coupled at run time enabling automated configuration and reconfiguration.

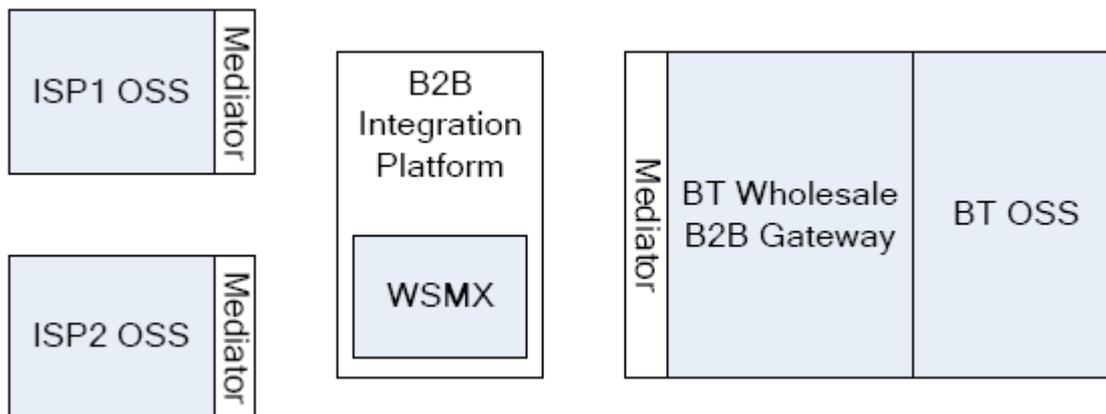


Figure 1: The architecture of the B2B integration platform

Looking Ahead

In the future, many more players within the industry are expected to expose their interfaces for integration. These will include service, wholesale and content providers. As more companies expose their interfaces, dynamic integration technologies such as WSMO increase in value, since the economies of scale are greater. The initial effort required in creating ontologies, describing interfaces semantically, and relating the two together is much less than the total (traditional) integration effort. It is also likely that certain ontologies will flourish, while others will not, resulting in de facto standard ways of describing things. Mediation will be important both to map low level messages and data to the ontologies and to integrate new services (and ontologies) of players in previously unimagined fields. In this more fluid environment the customer is given more power since

they are the ones who are able to choose the components in their service bundles and can even start to create integrated bundles that providers had previously considered unviable or perhaps not considered at all.

Key Benefits of Using Semantic Web Technology

- Reduced time-to-market
- Reduced integration costs
- Improved customer satisfaction
- Semantic allow more automated mediation
- Ontologies simplify reuse of services

References

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3. <http://dip.semanticweb.org>
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