Extending the Web Services model to IT services

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Introduction

Web Services and Service Oriented Architecture (SOA) represent a radical departure from traditional monolithic, tightly bound, customized applications with proprietary interfaces. Their range however is limited as yet by the very structure and standardization which support their interoperability. While they are able to support heterogeneity of technical components, their ability to support complex business interactions has yet to mature. This poster summarizes research in progress which asks how might the Web Services model be mapped to other kinds of IT services and extended to account for services of greater human and organizational complexity through their lifecycle. The research proposes the construction of a generic IT service model and a taxonomy IT services to provide a frame of reference for analysis and evaluation for the extension of the Web Services model and for a transition to a service oriented view of IT.

1. Web Services and IT services

Service-Oriented Architecture (SOA), defines all functions as independent services loosely coupled with standardized, invokable interfaces. Supported by computational techniques, Web Services are virtual components in this architecture, automatically discovered and dynamically bound in defined sequences to support business processes.

The standardized, structured and computational characteristics of web services are key to their interoperability. However the application of web services is currently possible only in limited circumstances: that is, where variables relating to the service can be expressed computationally.

As important as Web Services themselves, perhaps, is the central notion of IT as a service which underpins SOA. The challenge for a IT service model such as Web Service model is whether that service concept can be extended to address the complexity of business applications in a human and organizational context. Matters such as metering and billing, contracting, customizing, service level agreements, service failure/continuity, change, reliability and capacity are lifecycle service management issues which need to be addressed.

2. The Web Services model

A Web Service is a series of IT resource components aggregated according to business rules to provide IT support for a business process. Its key dimensions can be represented in a simplified way as an end-to-end service supply chain as in the instance shown below (shaded).

![Fig. 1. Web services model](image)

The question arises, how does this model relate to other models of IT services?

3. Other IT service models

To answer this question, a preliminary examination of the literature revealed the following key dimensions of services in a comparison of Web Services (WS) and three other IT service models: Application Service Providers (ASP), network services management (N/W) and IT Service Management methodologies (ITSM).
From this, the key dimensions of IT services can be represented:

<table>
<thead>
<tr>
<th>Business process</th>
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<tbody>
<tr>
<td>SLA</td>
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<tr>
<td>Lifecycle service delivery and support processes (availability, capacity, contingency etc.)</td>
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<tr>
<td>service</td>
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<td>service</td>
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<tr>
<td>mapping resources to services</td>
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<tr>
<td>s/ware, h/ware, infrastructure</td>
<td>resource layers</td>
<td></td>
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</table>

Figure 3. Key dimensions of IT services models.

In addition, the key dimensions identified so far suggest the classification of IT services on the basis of their degree of structure and level of uncertainty. Degree of structure refers to the extent to which the specifications of the service and its impact are clear and the degree to which the service processes are able to be standardized and automated. Level of uncertainty refers to the degree of predictability of contingencies over time. By defining complexity as a factor of these, we have been able to make a preliminary classification of the models found in the literature, based on the complexity of the models.

4. A preliminary taxonomy of IT services

![Figure 4. IT service models classified by complexity](image)

5. Case studies of IT services

These key dimensions are now being used as the initial constructs for data collection in an exploratory multiple case study. Data is being collected and analyzed from four cases of different types of IT services (including Web Services), to refine and expand the description of key dimensions of IT services and the generic IT service model, and to classify the service models in a taxonomy based on complexity.

6. Some implications

The utility of such a taxonomy is expected to lie in its application as a framework for the development and management of Web Services: for example, to encompass the dimensions of lifecycle support and resource mapping; for the transition of existing IT applications to IT services or Web Services and for the analysis and assessment of IT services in, for example, contract negotiation and risk management. It could also serve to provide a common reference point for the standardization of terminology and processes relating to IT services.

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**Figure 2. Summary of Key Dimensions of Service Models**

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