

**Web of Services for Enterprise Computing:  
A Position Paper**

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### Introduction

Today the web and the web technologies play a critical role in our offerings and our customer's and our own enterprise infrastructure/environment. While the web has influenced every aspect of enterprise infrastructure, its influence on an enterprise *document* lifecycle has been profound.

Enterprise *data* is intimately connected to the enterprise documents; however influence of web on data management is not as profound. There may be historic reasons behind it. We identify a few barriers in this area that we believe could be overcome through closing the gaps in the Web standards and best practices.

Enterprise *control* is another area where we believe the web can play a critical role and rethinking standards landscape may be needed to alleviate some of the problems here.

Finally, the enterprise *services* area is where many of our business needs are fulfilled, and where document, data and control converge through business logic to yield a business function. We define *services* to be broader than it is sometimes assumed in the technical community. The gap between infrastructure needed for our 'broader notion of a service' and the notion a 'service as an invoked programmatic function' is substantial. It is this gap that may be more relevant in the context of the proposed workshop.

In the next section we would like to discuss these problems through relevant use cases or scenarios.

### Problem Discussions

#### Documents:

As stated before, web architectures and technologies have had profound impact on

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enterprise document management. Much of the web- technologies have played a role in making a document a transient artifact. That has helped make documents/web pages more current, more customized and potentially more relevant. The same properties sometime inhibit some of the traditional values of a document.

A scenario is an electronic document in a business environment goes through several business relevant states such as several levels of submitting, approval, editing, restricted access state, archiving etc. While much of the access-reading-communication can still be supported by web and web technologies, other business operations are done more easily on application specific documents.

One option to consider may be to provide an identity for each snapshot (document) and ability not only retrieve it on demand, but also an ability to assert and retrieve any business specific state.

### **Data**

In order to manage high value data in a flexible and extensible way, web standards such as XML Schema, OWL etc. provide a rich set of constructs. This enables us to maintain data well beyond the lifecycle of anyone tool or software, and across multiple vendor products and offerings.

Increasingly one significant problem we are facing is inability to easily assess compatibility of data models across domains and over time. It is difficult for one to assess commonality and difference between two schemas and hence many of the

difficulties of transforming data instances (fragments) for interchange and integration is still a significant challenge.

### **Control**

In today's architecture request, reply based point to point communication and control is well supported. However 'conversations' or ability to assert for 'valid' or 'meaningful' conversations is not unsupported. Many business services can be realized only through such 'valid' conversations.

A secure document scanning scenario may involve a service providing system doing a sequence of interactions with user and with other corporate infrastructure. These sequences are well defined and are bidirectional. An interaction for storing a scanned file may result in multiple temporally distributed responses. All of these 'control' flows are difficult to represent. This also results in inflexible integration requirements.

Workflow is an important construct in our product offerings. Claimed compatibility of the WS-CDL and BPEL is not observed by our application developers. Further a predefined choreographed workflow does not automatically yield a service that can recursively be choreographed. A language (description or execution) that integrates the essential features of both is attractive to us. We believe such a language will be a significant plank of the web services stack.

### **Web Services**

Finally the critical element of the "web of services" theme is the web services stack – all of it.

The gap between what we perceive as a 'service' and what WSDL describes is substantial. While interoperability, vendor neutrality and no dependence on single implementation etc. are big wins, the low level, request response based model captured

by WSDL is even weaker than decades old distributed systems infrastructures such as CORBA and COM. Convenient interaction models such as 'subscribe-notify'; 'publish-subscribe' are not supported. That combined with lack of agreement and multi-vendor support for a common web services stack is inhibiting our ability to migrate to web services in a big way.

Through this workshop we would like to articulate these concerns and participate in generating the advice/recommendation to W3C.