

## **SOA based document management**

*A White Paper  
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*Leveraging OCS and Oracle SOA (BPEL)  
for seamless document management*

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## Executive Summary

This white paper describes how Oracle's SOA Suite can be integrated with Oracle Content-DB to simplify and automate document management processes. The solution approach is discussed with reference to a SOA/BPEL implementation done at AKT America Inc.

Document management solutions are a key component of a modern enterprise. Maintaining the accuracy and sanctity of the document management system is critical to protecting a company's intellectual property. In general, this is achieved by enforcing tight workflow controls over the document vault.

While workflow routing and approval processes ensure that the document management system remains accurate and secured, very often their inherent complexity makes it difficult to maintain the system in the long run.

As the complexity of the process increases, a manual approach to managing them becomes time-consuming as well as error-prone. In such cases, implementing an automated document management process can bring in multiple benefits both in terms of simplifying the process for document-administrators as well as ensuring an error-free system in the long run.

This white paper discusses how Oracle Content DB repository was integrated with Oracle BPEL to build an automated document management system at AKT America, Inc.

## Business Case

AKT America Inc. uses Oracle Content DB as an effective storage solution to store engineering documents. Adopting this solution made it possible to improve performance across a geographically distributed user-base and also allowed better document controls/access provisioning. However, the approval cycles/processes required for revising documents made it difficult and time-consuming to administer the OCS repository.

In order to simplify document management workflows, a major part of the workflow process was automated by integrating the OCS repository with Oracle BPEL.

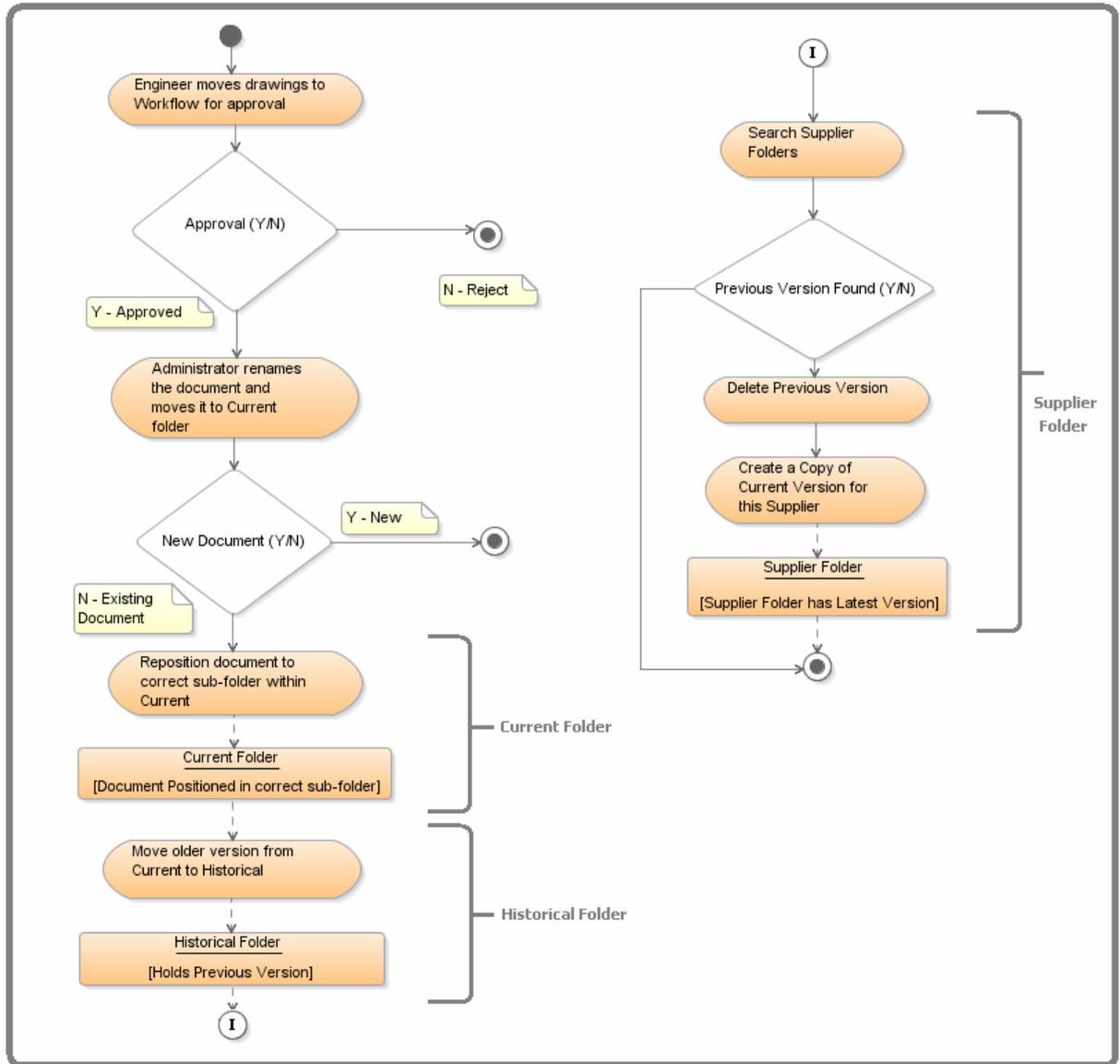
This integration ensured that business processes within the document management department were automated and required minimal human intervention. Benefits of this automation were manifold -- as a result of the automation, document approval cycles were shortened dramatically. Even more importantly, the automation helped in elimination of human errors that could arise while processing documents in bulk manually.

Fig-1 illustrates the workflow process that was automated as part of this OCS-BPEL integration project. As the flow diagram illustrates, the original workflow process required modifications to multiple folders for revising a single file. Due to this, the chances of manual error were quite high. Moreover, a considerable amount of time was required to process a single file manually – so automation essentially presented a two-fold advantage.

As can be seen in Fig-1, the primary use case was that of a file being revised. To ensure that file revisions were tightly controlled, the process outlined in Fig-1 was laid out during the initial implementation of OCS for the client. However tight controls imposed by the process also implied that every file revision had to be administered by a document administrator who would have to spend considerable amount of time for revising a single file.

The possibility of manual error was even more with certain folders like the “supplier” folder (a folder which was exposed to suppliers). Within the “supplier” folder, a single file/drawing could be made available to multiple suppliers. While executing the workflow manually, if any one single file modification was missed out due to human error, it would essentially mean that certain suppliers would still be accessing older versions of the file. This could lead to a case wherein the supplier would still be accessing the older revision of the document – and hence the

product he supplies could potentially be out of sync with the requirements laid down in the latest drawings.



**Fig-1 : Document management workflow process for this Business Case**

In order to make the process more streamlined and error free, the workflow process shown in Fig-1 was automated. The primary goal of this automation was to ensure that the client would require minimal manual intervention to administer the document repository; hence minimizing the possibility of manual error.

## Solution Overview

The first objective while exploring a solution for this business case was to find a hook-point into the OCS system. This hook-point was essential to gain access into the OCS system, thereby allowing a custom automation program to execute within the OCS framework whenever a triggering action was performed by a user.

We explored native integration points exposed by the OCS repository and this led us to the AQ integration that OCS supports. OCS-AQ integration makes it possible to trap events like Move, Copy, Paste... etc that would be performed over OCS folders/files. Thus whenever a file/folder was subjected to a specific event, OCS would allow one to enqueue an XML payload into the database AQ. This payload was available for any third party system that would need to be notified about an activity within the OCS system.

However, just having a hook point would not suffice; instead we also needed a means to gain access to the OCS repository and automatically move/reposition files that would otherwise have to be manually moved.

So the question before us was to come up with an efficient and extensible solution that would utilize the XML payload enqueued in AQ and access the OCS repository to automatically perform workflow operations over it.

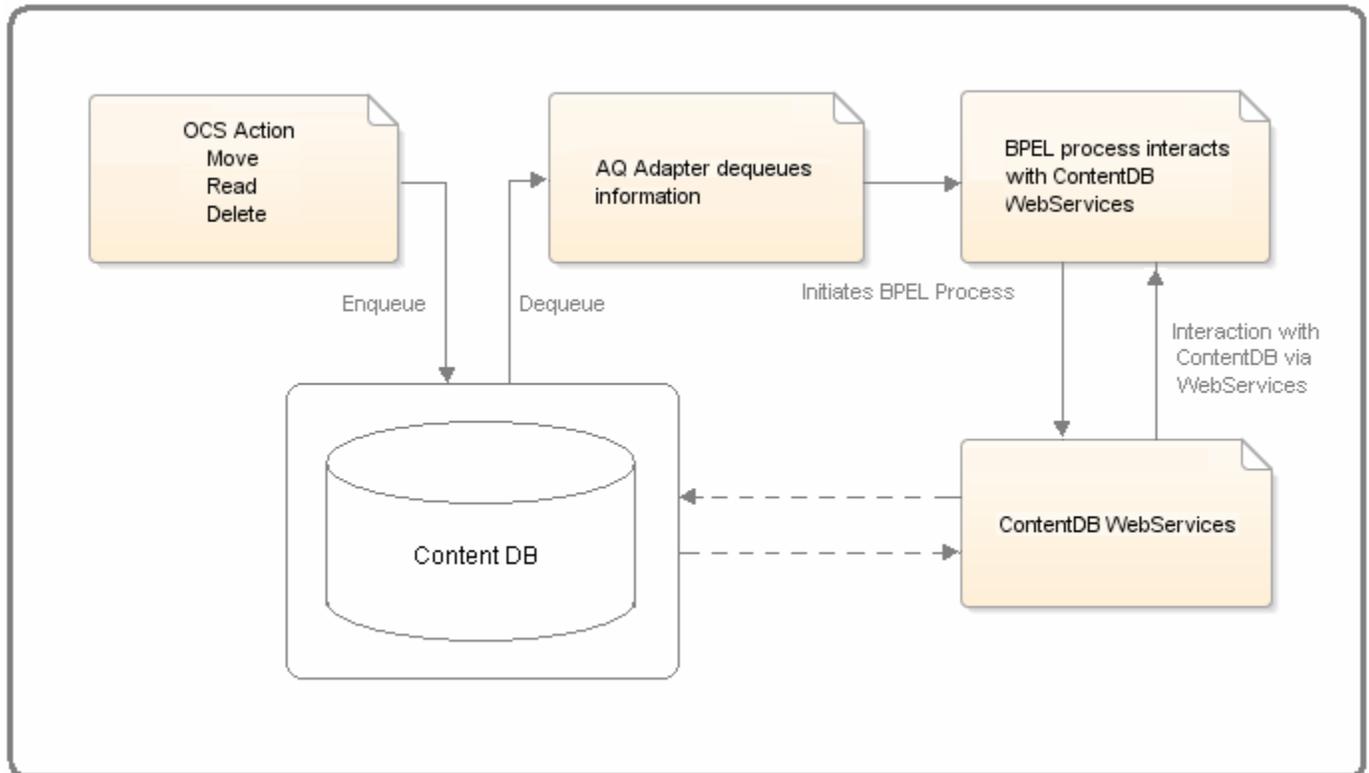
We chose to go with Oracle BPEL as the chosen platform for this implementation due to the following reasons

- a. Support for AQ adapters to dequeue information from AQ.
- b. Tight integration with Web-Services which makes the solution extensible.
- c. Oracle BPEL being the successor of Oracle Workflow, recommending it for our client implied that the solution could be enhanced/extended in future with minimum effort.
- d. Failover features of Oracle BPEL

So we utilized the AQ adapter feature within Oracle BPEL to dequeue information from AQ and simulate the rest of the workflow processes. So, essentially, the processes which would normally be done by a document administrator would be performed by the automation program coded in Oracle BPEL.

## Implementation Details

The figure below shows a brief overview of the solution implementation.



**Fig-2: Technical architecture of the automation process**

As mentioned in the previous section, the first step in automating this document management process was to get a hook-point to the triggering action of the workflow process. For this integration, OCS's AQ integration was used as the starting point for the integration. We intercepted the message enqueued into AQ using a BPEL-AQ Adapter. The BPEL process used simple XPath expressions to extract information of interest out of the enqueued XML payload. So, whenever an action (in this case a "Move" action) was performed on a particular folder, the BPEL process would dequeue pertinent information from AQ and initiate the automated document management process.

AQ being a generic feature, multiple different subscribers/consumers might subscribe to messages from the same queue. In such a case, the differentiating factor is a parameter called the *correlation\_id*. This parameter makes it possible to match a subscriber to the message he expects to find enqueued in AQ.

Having dequeued the message, the next step was to extract few important parameters that would uniquely identify the triggering action and also files/folders that were impacted by that action. In the case of the XML payload enqueued by OCS, a parameter called Workflow-Id uniquely identifies the actions performed during the workflow session.

Given this Workflow-Id, one can use OCS APIs to identify the set of actions performed during a particular initiating action. In addition, OCS provides a java object called ContentServicesSession with which one can access/manipulate the repository very much in the same way as how a user would be able to do manually. Thus, with the help of the Workflow-Id and the ContentServicesSession object, we were able to gain access to a set of OCS Web-Services which allow our automation logic to be acted upon the OCS repository.

## **Conclusion**

The above discussion illustrated how an automated document management system can be built using Oracle Content-DB and Oracle BPEL. Automation can greatly enhance efficiency of document solutions and at the same time help build an error-free system.

With SOA based technologies like Oracle BPEL, the solution becomes highly extensible – hence future enhancements can be implemented with minimum effort and cost. Another salient point to be noted is that Oracle BPEL has tight integrations with almost all other emerging/prominent technologies in the market. Hence integrating this system with any third party application in future would be much simpler.

Automated document management systems have the potential to greatly enhance the efficiency of businesses. And this becomes even more relevant with the usage of technologies like Oracle BPEL which make it possible to build easily extendable solutions that offer a lower total cost of ownership in the long run.

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