SOA-based Integration of IT Service Management Applications

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Abstract

IT service providers use applications to support their business processes. The need for specialized IT management functionality and information generates a multitude and diversity of management applications that can be recognized in one IT provider's scenario. To run IT and to provide IT services effectively and efficiently, management applications have to be integrated along operational processes. This article introduces an approach to integrate management applications by leveraging a Service-oriented Architecture (SOA). Therefore, a sufficient understanding of IT service provider's processes and cooperative roles is essential. The presented SOA defines how to integrate management applications loosely coupled in a process-oriented manner, bridging the gap between operational processes and management applications.

1. Introduction

IT service providers have defined their business processes for operating IT and providing IT services according to standards like IT Infrastructure Library (ITIL) [3]. Examples of provider's business processes are configuration management, change management, problem management, service level management etc. For executing these processes, IT provider's employees use different management applications. Today management applications can be classified depending on their main functionality to monitor and control networks, systems or applications. Furthermore, they support IT providers in running operational processes and offer functionality for managing IT services and service level agreements (SLAs). Due to the diversity of management applications, productivity and service quality of an IT provider's business depends decisively on the integrated usage of these management applications. Existing management solutions mainly focus on IT resources. Solutions for managing IT

services, customers and operational processes are not sufficiently developed nor integrated with other management applications following IT providers' processes [5]. Approaches like management platforms focus on homogenous views on heterogeneous IT components but not on process-oriented integration of management applications thereby not being flexible enough to cope with the challenges of changing customer requirements and dynamic management processes. Instead of integrating applications on data or functional layer – preferred by existing management architectures and platforms – this article presents a process-oriented integration approach following Service-oriented Architecture (SOA) principles.

2. Requirements Analysis

Before a SOA for IT service management can be established, IT service provider's business processes and management applications have to be understood. As a first step, the scope of the business domain to be supported and modeled should be determined. According to the introduction, we will focus on IT service provider's business domain. Its business objectives can be seen in enabling and supporting customer's IT usage processes. Therefore, it provides quality-based network, system and application services. In a second step, stakeholders involved in IT service management processes should be considered. The term stakeholder subsumes persons participating in IT service management, namely IT provider's staff members, customers, suppliers and business partners. IT providers have to satisfy customer demands by offering appropriate IT services on different service levels. Suppliers and business partners support the IT provider in service provisioning by offering external IT services or human resources. In a third step, business use cases initiated by external partners have to be analyzed precisely. This includes business processes such as processing service information requests, negotiating and concluding SLAs, delivering services

as well as reporting of SLA status. These processes have in common that they are directly triggered by customers and rely on internal, supporting processes.

3. Integrated Architecture

For supporting example business processes, two management applications have to be taken into consideration. The Configuration Management Database (CMDB) provides comprehensive information about managed configuration items which are installed in an IT service provider's scenario. The Service Catalog Manager (SCM) supports administrating and cataloging service (module) descriptions [4]. The functionality of both the CMDB and the SCM is wrapped by a Web service interface. Directly relying on these elementary Web services, aggregated Web services can be specified. They represent higher-value business services that can be used by workflow or user tasks respectively. Instead of being used by workflow processes and user tasks, higher-value Web services can be directly exposed to a portal. In summary, it can be ascertained, that the proposed integrated architecture for IT service management contains different building blocks [1]. In this section, the Service Catalog Manager (SCM) is given more attention by demonstrating integration efforts. In order to enable the SCM to participate in SOA-based integration, adapters have to be added afterwards. In our scenario, Web services are chosen for implementing adapters. Enabling clients to interact with the SCM Web service, creating a corresponding interface description completes the adapter construction. In the case of Web services, a WSDL document contains necessary information required by clients to invoke the Web service. Therefore, WSDL documents specify type definitions for data elements expressed in XML schema, message definitions built up with these data elements and operation definitions for input, output and fault messages. Finally, several operations can be combined to port types finishing the abstract part of WSDL. Involved management applications have to be wired along to activity sequences of business processes or use cases. To perform the technical wiring, the activity sequence has to be mapped to a business process description and execution language. Therefore, the Business Process Execution Language (BPEL) [2] is used to achieve process-oriented integration.

4. Conclusion and Outlook

As proof of concept this approach has been successfully applied in BEA WebLogic. Relying on such a comprehensive SOA middleware platform, tedious and error-prone work is handled by tools. Furthermore, proprietary elements facilitate establishing Service-oriented Architectures by compensating current Web service drawbacks. When applying SOA concepts in productive environments, some restrictions have to be taken into account. For instance, combining sophisticated user interaction with process instances is difficult to handle. Concepts that have been well-established in conventional workflow management environments such as assigning tasks to roles for enabling people to collaborate have to be advanced. Leveraging Web service standards for interface construction overcomes interoperability problems, but to reach functionality used in conventional middleware approaches a lot of specification effort has yet to be done. In the meantime relying on proprietary mechanisms may be suitable, but it means certain vendor lock-in and interoperability problems between competing platforms. In accordance with the preceding discussions, this article has pointed out that IT service management can benefit from SOA-based integration.

5. References

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