A Research on Flexible Business Process Management System based on Knowledge Base and Semantic Web Services

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***Abstract*—Accompanied with the great changes of information technology and marketing globalization, business processes of enterprise must be dynamically adjusted and optimized, which leads to strict requirement on Business Process Management System. Based on comprehensive study and analysis of existing business process management model, this paper proposes FBPMS (flexible business process management system), which combines knowledge base and semantic web services, to provide support for a variety of dynamic business process and its continual improvement.**

Keywords-FBPMS; semantic web services; knowledge base

I. INTRODUCTION

Business process is one of the major factors of sustaining and improving enterprise core competence. Accompanied with the great changes of information technology and marketing globalization, business process is becoming more and more variable, dynamic and flexible, which requires the BPMS (business process management system) agile changing. Semantic web shows more and more sophisticated along with the fast development of technology, which brings new opportunities to resources integration, and makes web services composition more automatic and intelligent. Knowledge base has been considered as valuable strategic assets which can provide competitive advantages. Based on comprehensive study and analysis of existing business process management model, this paper proposes FBPMS (flexible business process management system), which combines knowledge base and semantic web services, to provide support for a variety of dynamic business process and its continual improvement.

First, this paper introduces FBPMS and its overall architecture, and then describes its design details and application. At last the conclusion and future improvements are proposed.

II. RELATED WORK

Through business process modeling and automation, BPMS is used to manage and optimize enterprise business process. Recently, business process has becoming more and more dynamic, flexible and variable, however existing BPMS, lacking of flexibility, can not meet the demands well. In the most existing BPMS, business experts often use process modeling tools to generate process models, and then, according to designed models, find specific services and bind. When the process needs change, they should re-design process, re-bind service and redeploy. For different vendors providing various services, it's difficult to find appropriate services timely, which can not quickly achieve process variability. Therefore we need to find a new way to improve the flexibility of BPMS. Semantic web is becoming more sophisticated, which brings new opportunities to resources integration, and makes web services composition more automatic and intelligent. For dynamic web services composition, candidate service is non-predictable during the service composition phase, which makes services combination more arbitrary and unknown. In knowledge economy times, knowledge has been considered as an indispensable resource for enterprises. Enterprise knowledge derives from technique personnel's understanding of its business environment, and represents the accumulation of the experience during the business operation, and involves distillation of abundant data and information within the enterprise.

Based on the study above, combined with knowledge base and semantic web service, a flexible business management system is proposed, aiming at the need of the process agility.

III. DESIGN OF FBPMS

A. FBPMS Architecture

FBPMS provides an effective infrastructure for the definition, operation, and modification of process, and supports the definition, publish, search, and matching of services. According to hierarchical thinking, the architecture of FBPMS has been correspondingly divided into the presentation layer, process modeling layer and service layer, as shown in Fig. 1.

1) Presentation Layer: This layer has two main modules including user interface and knowledge base maintenance interface. With the user interface, users can interact with the system. Through the knowledge base maintenance interface, business experts and maintenance personnel, can maintain the knowledge base.

2) Presentation Layer: This layer has two main modules including user interface and knowledge base maintenance interface. With the user interface, users can interact with the