A-Stein : a prototype for artifact-centric business process management systems

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Abstract—**Businesses and other organizations increasingly rely on business process management, and a data-centric approach to workflow has emerged that are centered on "artifacts". This approach introduced by IBM focuses on data records, known as artifacts, that correspond to key business relevant objects, and that flow through a business process specified by a series of web services. Our researches carry on this approach, and create a prototype for artifact-centric business process management systems, named A-Stein. In this paper, the architecture of A-Stein is introduced firstly, and then the main portions in it are specified respectively, such as Artiflow Manager, Process Creator and Process Detector. Finally, a living example of restaurant business process is designed and running on this system.**

Keywords-business process management; artifact; Artiflow; Serflow; web service

I. INTRODUCTION

BPM (Business Process Management) includes methods, Techniques, and tools to support the design, enactment, management, and analysis of operational business processes. It can be considered as an extension of classical Workflow Management (WFM) systems and approaches [1].

As its developing, organizations try to automate their business processes using coarse-grained services that implement specific parts of their business functionality. Services are self-describing, platform-agnostic computational elements that support rapid low-cost composition of distributed applications [9]. Recently, Web services are one popular technology for implementing such services. Composing different services into a structured process can be done by using an orchestration language such as WS-BPEL (the Web Service Business Process Execution Language, BPEL for short)[11].

Artifact-centered BPM is a kind of data-centered BPM introduced by IBM [3, 4]. Artifact-centered business process modeling method focuses on the data which played important part in operations during business process, and such data entities which are really exist are called artifacts.

An artifact is a concrete, identifiable, self-describing chunk of information that can be used by a business person to actually run a business [2]. The key properties of business artifacts are described as follow: i . A business artifact consists of an enterprise-wide unique identity and self-describing content; ii . The identity of a business artifact cannot be changed; iii. The content of a business artifact can be modified arbitrarily. Business artifact has lifecycle. A whole lifecycle embodies the implementation of a business process. An artifact goes through different states during this implementation, and these states mean different process progress. Literature [5,6] made researches on the properties of artifact using formalization methods, and made a static analysis on artifact-centered business process system.

Literature [7] introduced the definition of Artiflow, and presented a method of converting Artiflow into physical workflow automatically. Artiflow is an artifact-centered business process logical model, which describe business process through the attributes of graphs and their interrelations. In Artiflow, element service describes business activity; repository describes the storing of artifact; external or internal events drive the execution of business process; artifacts express the core data of business; the lifecycle of artifacts measure the schedule of business purpose. Literature [8] made a formalization definition for Artiflow model, and further designed and developed a modeling tool for this model.

In this paper, we introduce a prototype for artifact-centric business process management systems, named A-Stein, which is based on the artifact thinking and artiflow model. This is the first design and developing an artifact-centric BPMS, and both the architecture and the modules have been well researched.

II. DESIGNING AND DEVELOPING THE ARCHITECTURE AND EACH MODULE OF A-STEIN

A-Stein is a prototype for artifact-centric business process management systems. In this part, we present the architecture and then introduce the function and method of each important module in it.

A. The Architecture of A-Stein

Eight main modules contains in the architecture of A-Stein, as shown in figure.1.

Artiflow is a business process describing model centered on data. Artiflow Manager presents a design method to describe the business process in true-life as a form of artiflow, checks on the processes and further gives an optimize advice.