ONTOLOGY - BASED DYNAMIC BUSINESS PROCESS CUSTOMIZATION

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ABSTRACT

The interaction between business models is used in consumer centric manner instead of using a producer centric approach for customizing the business process in cloud environment. The knowledge based human semantic web is used for customizing the business process It introduces the Human Semantic Web as a conceptual interface, providing human-understandable semantics on top of the ordinary Semantic Web, which provides machine-readable semantics based on RDF in this mismatching is a major problem. To overcome this following technique automatic customization detection is an automated process of detecting possible elements or variables of a business process that need to be especially treated in order to suit the requirement of the other process. To the business process to be customized as the primary business process and those that it collaborates with as secondary business process or SBP Automatic customization enactment is an automated process of taking actions to perform the customization on the PBP according to the detected customization spots and the automatic reasoning on the customization conceptualization knowledge framework. The process of customizing business processes by composite the web pages by using web service.

Keywords

Primary Business Process, Secondary Business Process, Human Semantic Web, Composite Web Service.

1. INTRODUCTION

In consumer-centric business modeling, an important task is to develop semantic-based frameworks that make a business process easier for consumers to do business with. This will demand a measure of business process customization. Automating this task has been made easier by service-oriented architecture. In a service-based business process, each activity in the process is treated as a message exchange with an operation supported by some Web service. The process itself can then be described as a composition of Web services using a standardized language such as the Business Process Execution Language (BPEL) [2] or Web Ontology Language for Web Services (OWL-S) [3]. A service-based business process by nature allows more agility in the process due to loose coupling, service reuse, and dynamic binding. The [4]Semantic Web contains three levels of semantic interoperability: isolation, coexistence, and collaboration. Collaboration, as the highest goal, can be achieved by conceptual calibration, which builds bridges between different ontologies in a bottom-up way, describing their similarities as well as their differences. Web service composition [6] refers to the creation of new (Web) services by combination of functionality provided by existing ones. This paradigm has gained significant attention in the Web services community and is seen as a pillar for building service-oriented applications.

A categorization-based scheme to match equivalent Web services that can operate on heterogeneous domain ontology. Given the upper ontology for services and domain ontologies, service matching scheme determines whether a given Web service is a possible replacement using a categorization utility called OnExCat [5].A framework for customizing service-based business processes based on OWLBPC by first identifying the possible causes of discrepancies inconsistencies between collaborating business processes (*customization detection*) and then taking suitable remedial actions (*customization enactment*). Our solution and framework can do the following: 1) deal with semantic inconsistencies like semantic mismatching of process parameters; 2) resolve behavioral mismatches between services which may or may not be compatible; and 3) address misaligned rendezvous requirements. Such capacities are applicable to business processes with heterogeneous domain ontology. Orchestration is a technique used for carry out the composition of web service. It is a workflow that combines invocations of individual operations of the web services involved. In this paper, it proposes a different approach to web service composition, whereby entire services are composed into composite services. The system contains service concept selection, service concept recommendation; service concept obtainment. A composite service has all its operations available for composition or orchestration. By contrast, in an orchestration, only the chosen individual operations of the member services are available for invocation. The rest of this study is organized as follows. Section 2 presents the service based process customization; Section 3 and 4 describe the Customization Detection and Customization Enactor, Section 5 describes the Semantic Design of the proposed system. The concluding remarks are finally made in Section 6.

1.1. Service Based Process Customization

The generic solution to business process customization is lead to the realization of the vision of human semantic Web in a business. The problem that can be described as business process needs to communicate with another by calling its Web services and exchanging XML messages with it. The following things are consider for customizing the business process 1) the establishment of a conceptualization of business process customization together with the associated markup language; 2) the creation of an ontology for this specific problem; 3) the instantiation of this ontology in describing a specific instance of customization; and 4) the application of efficient reasoning to automatically determine the meaning of certain customization instructions and actions. Process customization should enable users to build, fit, or alter a process for making the life of its business partners easier in doing business automatically. A service-based business process provides a standard foundation on which to build the customization. The kind of Meta data that be act as a discrepancy between two interacting business processes. RDF is a standard model for data interchange on the Web. RDF [10] has features that facilitate data merging even if the underlying schemas differ, and it specifically supports the evolution of schemas over time without requiring all the data consumers to be changed. Resource Description Framework (RDF) as the presentation format of the metadata in support of describing and interchanging knowledge of customizing service-based processes. Using the RDF, each concept in the metadata is modeled as a resource with a Uniform Resource Identifier (URI). Inference on the metadata of service-based process customization is important, mainly for answering the queries where implied knowledge of customization is needed. Such knowledge has to be derived from explicitly known facts or existing knowledge. For this purpose, use existing forward-chaining or backward-chaining rule engines for inference. For example OWL Inference Engine in Flora-2(F-OWL)[11].

2. CUSTOMIZATION DETECTION

In the figure 3.1 Customization Detector, the Scoper and Instrumentor identify all the customizable contents of the PBP and identify the ones that do need a customization because of their discrepancies with the secondary business process. The result is recorded by the Record Writer in Event Records. The Customization Detector relies on the NLP Rule Engine to inference on the OWL-BPC ontology for the knowledge of business process customization. It also relies on the categorization tool OnExCat to overcome the semantic heterogeneity of various business process descriptions.

2.1. Ontology Matching

On ExCat tool which is used to for ontology matching two important elements that enable an automatic way of processing business process customization are upper ontology of a business process and upper ontology of the process customization [9-10]. Both upper ontologies have to interface with domain ontology during the inference by an inference engine. an upper ontology on business process customization like OWL-BPC, automatic customization of business processes is made possible due to the presence of a machine

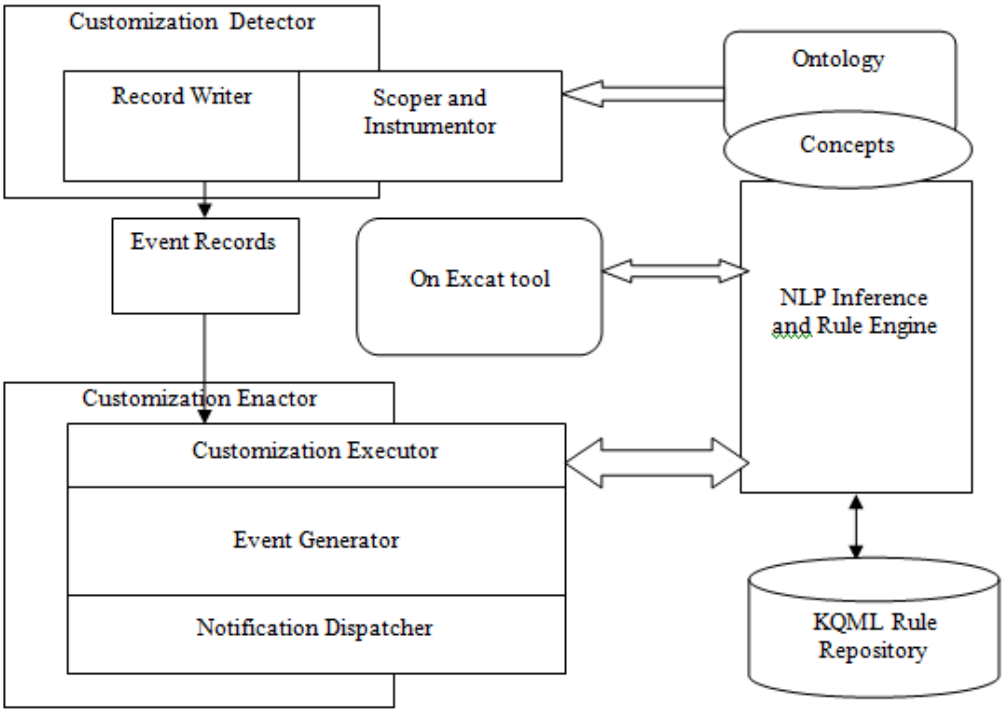

Fig.1. Business Process Framework

Understandable knowledge framework on what, when, and how customization should be performed. In the categorization of ontology instances is treated as a term category search problem. The techniques in the document classification of information retrieval are used. Just as document classification classifies a large collection of documents, the categorization of domain ontology instances classifies the terms in the textual or semi structured service based business

process descriptions to the concepts defined in given ontologies or thesaurus. Two complementary categorization methodologies: 1) Random Variable with Multiple Values and 2) co-occurrence are applied. Both technologies have been improved for processing Web service descriptions by incorporating service semantic information obtained during instance extraction.

3. CUSTOMIZATION ENACTOR

In the Fig3.1 shows the Customization Enactor consists of the Event Generator, the Customization Executor, and the Notification Dispatcher. The Event Generator takes in the event records and generates events. The events will be passed to the NLP Rule Engine for processing. The rules of customization are pre-edited through a rule editor, which is not shown in the above figure. The NLP Rule Engine will pass the action command, if any rules are triggered, to the Customization Executor to execute the customization. It will also pass the events to the Notification Dispatcher, which notifies the owners of the PBP and the SBPs.KQML (Knowledge Query and Manipulation Language) is a language and protocol for communication among software agents and knowledge-based systems. The KQML message format and protocol can be used to interact with an intelligent system, either by an application program, or by another intelligent system. KQML's are operations that agents perform on each other's knowledge.

4. SEMANTIC DESIGN FOR PROCESS CUSTOMIZATION

In the figure 5.1 illustrates the detail design of the process customization. In this user can enter the keyword into search engine which is specially designed [12-13] for fetching the right details from the Wikipedia-Word net or from the local disk. The KQML (Knowledge Query and Manipulation Language) is a language and protocol for communication among software agents and knowledge-based systems. The KQML message format and protocol can be used to interact with an intelligent system, either by an application program, or by another intelligent system. KQML's are operations that agents perform on each other's knowledge.NLP (Natural Language Processing) inference which is for understanding the keywords entered by the user and composite the related web service for gathering required result. The broker agent mapping the keyword to Wikipedia word net for answer composition to show the results

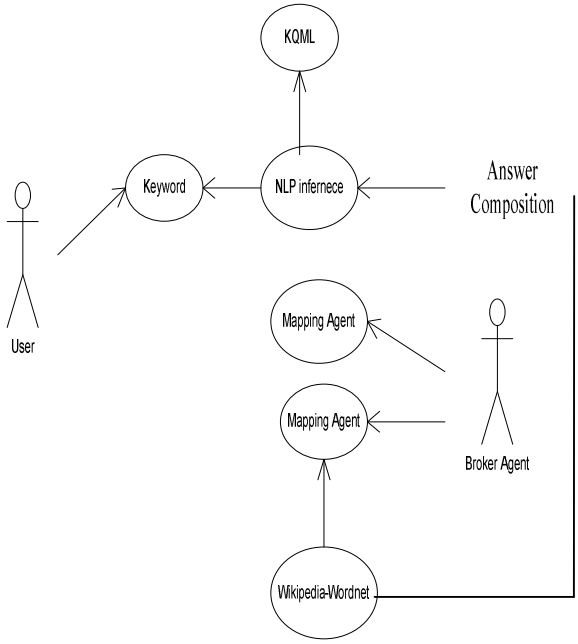

Fig. 2. Semantic Diagram for customization

5. CONCLUSION

The behavioral customization in nontrivial cases may depend on the run-time context of the business process execution. For developing a more comprehensive theoretic framework to address this issue. Currently, the framework is only able to perform customization statically before the business process is instantiated. Since the OWL-BPC is designed to handle both static and dynamic customization, in the process of implementing a dynamic customization capacity during or after the instantiation time. The fig 6.1 shows the comparison graph between the inference rule engines used in the business process customization framework. By using the Natural Language Inference the matching efficiency will increased compare to the existing one. Human semantic Web from the aspect of customizing the procedures of automated businesses transactions by accommodating the various characteristics of individual business partners, the way that businesses operate nowadays is more reliant on electronic devices and documents and in a networked way. Effectively using such devices and documents is largely supported by the semantic Web technology. However, the automation of the interaction patterns among the business partners will only be meaningful if the uniqueness of each partner is also part of the knowledge base equipped to the automated process by the semantic Web technology. In the framework both the customization detection and enactment the two techniques are used to solve both the semantic and behavioral mismatch. For future work the adaptation frameworks are used for improving the dynamic adaptation and their accuracy.

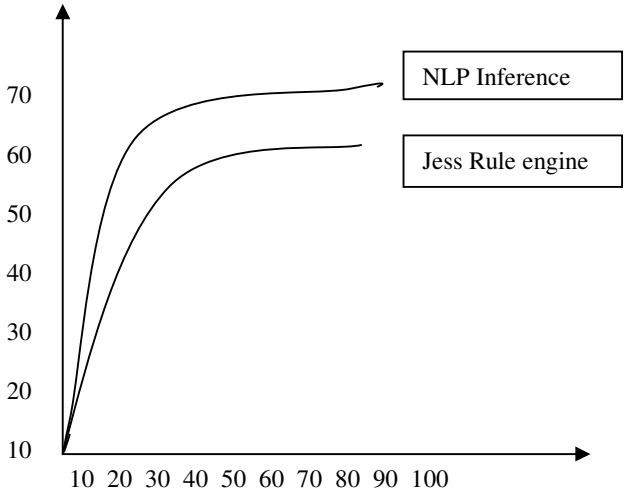

Fig 3 Comparison graph

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