IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 05, Issue 05 (May. 2015), ||V2|| PP 52-56

Modeling for the Sensor based Open System Application

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Abstract: - Over a decade, Service-oriented architectures have seen an increasing interest of both academia and industry communities. This interest is associated with an enthusiasm of companies in different sectors and sizes for the adoption of this new paradigm due to its economic and technological benefits. SOA is a very effective response to the problems faced by companies in terms of reusability, interoperability and reduce coupling between systems that implement their information systems. This paper proposes a Modeling for Sensor Based Business Process Generation and Testing, and introduces its implementation in the BPEL. and we analyzes business process between enterprises, modeling the service-oriented business process with BPEL to realization level. Also, In this paper suggests that UML is used from high-level business problems to the process of low-level problem for Visual and effectively.

Keywords: - *Business, Process, Sensor, Service-oriented architectures, System*

I. INTRODUCTION

Business process has become a core element that is indispensable in transactions within an enterprise and between enterprises. Along with the business process, there has been increasing interest in the integration of processes and the interface between enterprises, as transactions between e-marketplaces across industries become increasingly substantial. This process integration between enterprises requires that related enterprises exchange the information necessary to carry out business activities according to the given business process and that they implement a B2B interface and process. The objective of such integration is to connect the enterprise to the related transaction parties through the exchange of organized business events, including business data, in order to conduct business between enterprises[1].

In this paper, we solve the problem more visually and efficiently by providing services after analyzing and modeling them from the high-level enterprise problem to the low-level detailed process by using UML, a visual modeling language based on SOA.

II. RELATED WORKS

XML and Web Service standards are helping system architects to improve the definition of services and provide a consistent framework for realizing the promise of the service-oriented architecture(SOA)[2]. The evolution of Web services is at a point where designers can now start to see how to implement a true SOA. They can abstract a service enough to enable its dynamic and automatic selection and Web services are finally offering a technology that is rich and flexible enough to make SOA's Reality[3]. Also, recently, the peer to peer approach(P2P) has been much used as a related technique for collaboration and business modeling. The P2P approach is a method that allows for efficient peer-to-peer communication without a centralized hub or server environment.

III. MODELING AND IMPLEMENTATION

The overall process modeling sequence is described in Table 1.

Table I Business process modeling sequence

Process	Task
Domain Selection	Business Modeling Domain Selection and Overall Architecture Description
Business Process Requirement Analysis	Requirement Elicitation Business Use Case Modeling Narrative specification Activity Diagram
Business Process Definition	UML Stereo Type Definition about Business process - Class - Operation - Attribute

Business Process Modeling	Business Use Case Diagram Business Class Diagram Sequence Diagram Collaboration Diagram
SOA based on P2P business process modeling	Conceptual Service-Oriented Architecture Implementation SOA based P2P business process modeling

When business processes are classified into similar ones, they can be classified into 5 main processes with 8 subprocesses, as shown in Fig 1[4].

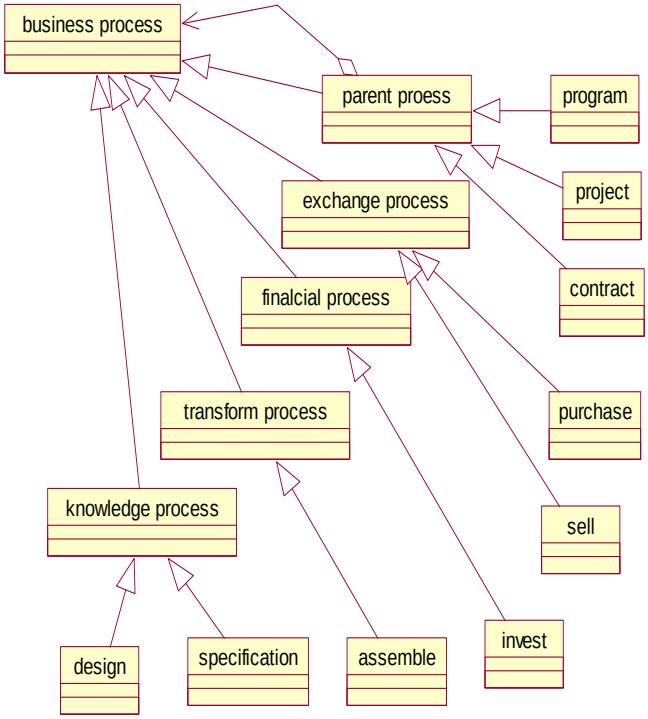

Fig. 1 Business process classification

The domain can be defined by the UML business class diagram shown in Fig 2 . Requirements analysis allows various levels of efficiency to be obtained by integrating processes between enterprises in different ways. In requirements analysis, The requirements which were extracted through a common domain analysis between CompanyA and CompanyB. The actor and use case are extracted based on the requirements obtained from the common domain requirements analysis of the business process. Fig 2 shows the business use case diagram which represents the interaction between the use cases provided by the actors and systems of the companies.

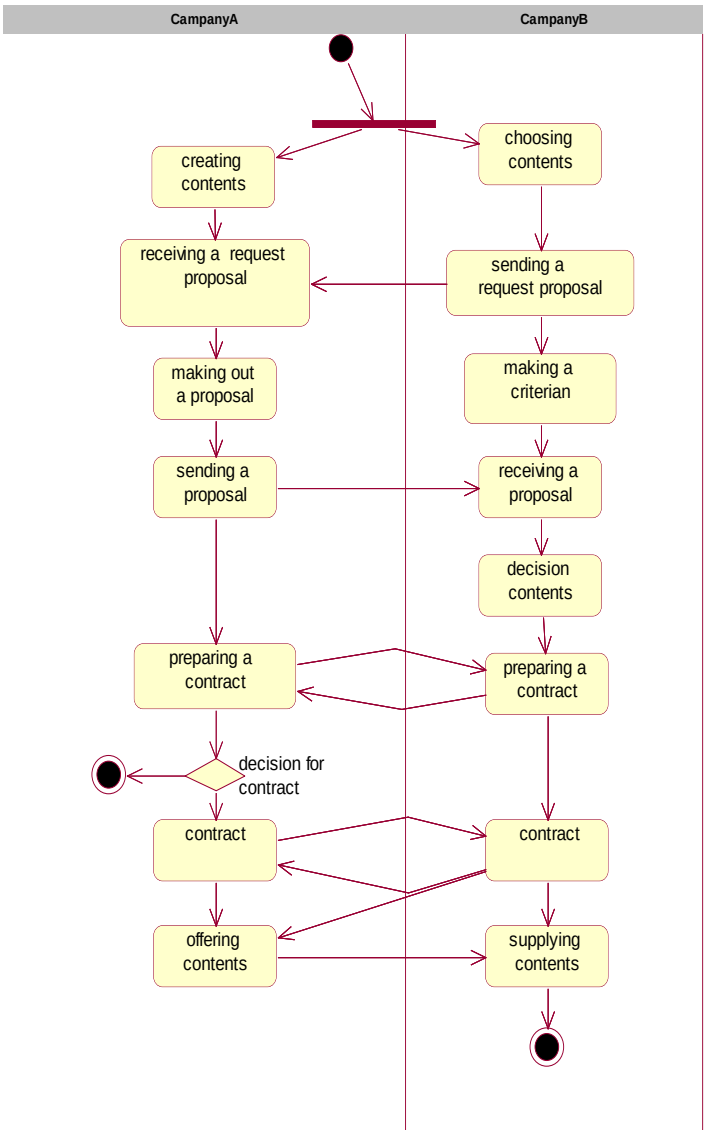

Fig. 2 Activity diagram for use case 'contract process'

Business processes can be divided into three main types. In other words, similar behavior in different processes can be used to group these process together into packages. First, the generic process package represents the standard business process previously defined by the process administrator. The packages of CompanyA and CompanyB are the processes that these companies actually implement based on the inherited generic process. And making contractA is the process which belongs to ContractA, representing the contract execution. The UML stereotype definition for modeling is shown in Fig 3.

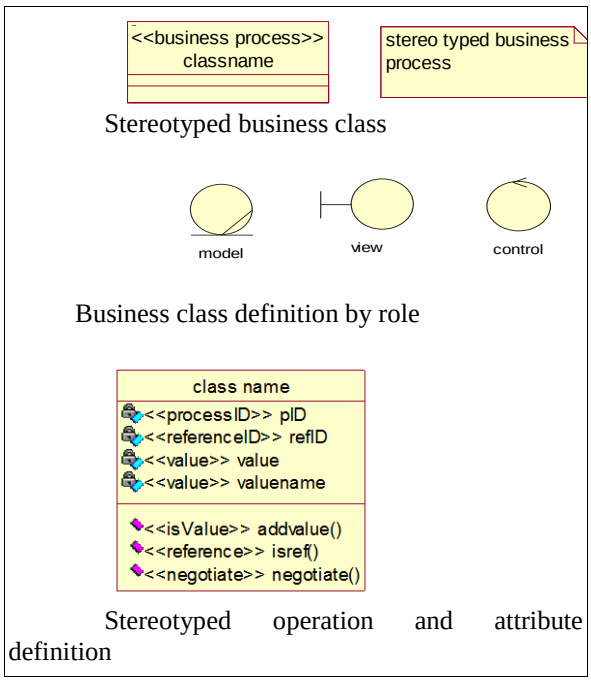

Fig. 3 Definition of stereotype

In order to model the working business processes, 2 models are developed separately: one for stereotyped negotiation and the other designed to make P2P possible by adding the stereotyped process ID and reference ID in order to insert the identifiable ID into the pre-defined process ID. In this paper, we apply the attributes and operations defined above that can add a value to the transactions between companies. By modeling each business process between enterprises in serviceable units, the common parts between processes are applied to the interface and the P2P service centering on the interfaces is implemented. The architecture comprises XML based interfaces using WSDL and sends messages using SOAP and, by using a modeling language called UML, those units related to services are composed and modeled. In order to solve the integration issues, SOA advocates a general approach to integrating diverse systems. We give an outline of that approach here, highlighting those details pertinent to our UML modeling.

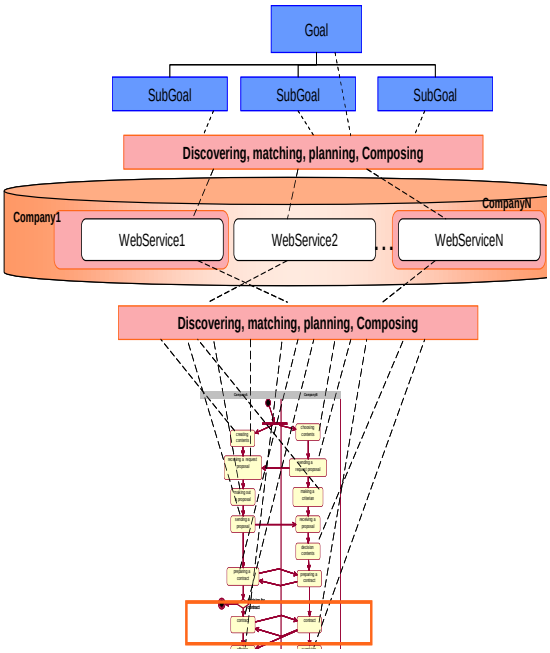

Fig. 4 Conceptual SOA based on P2P Business Process Model

IV. CONCLUSION

In this study, we perform UML integration modeling after analyzing the service oriented business process based on SOA. Each process is defined in the form of a peer in order to allow the process derived from the modeling of the business process to interact with other processes in the P2P mode. This paper proposes an efficient method of modeling business processes in a P2P manner based on the use of SOA throughout the modeling steps, in order to enhance the efficiency of the services. This results in the accurate modeling of an enterprise and allows for the more efficient and visual integration of processes between enterprises.

A formal specification is required for the design and implementation of the interface for the sake of the future process interoperability, and the testing of the interface focusing on the interoperability between peers should be considered for the interoperability of web services.

V. ACKNOWLEDGEMENTS

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education(2013R1A1A2007598).

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