DESIGN OF THE INTEGRATED AUCTION SERVICE SYSTEM BASED ON SERVICE ORIENTED ARCHITECTURE FOR BUSINESS MODELS

Case Study: Pawnshop of Surabaya City (Pegadaian Kota Surabaya)

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Abstract

This paper proposed a plan that SOA could be applied to conventional service change into IT service through a prototype design of the Integrated Auction Service System based on SOA for business models. The requirement analysis is proceeded by Unified Modelling Language and SOAML delivery strategy is selected the top-down strategy, service candidates and operations can be derived through analyzing detailed process of each use case, these can be abstracted at two service layers for effective implementation. Integrated Auction Service System was designed by WSDL, XML-based language and web-based programming language. By implementing ASP Visual C# to build dynamic web pages and database SQL Server is used to manage database. Testing process are Black Box and White Box testing unit.

Keywords— Service Oriented Architecture (SOA), Auction Service System

I. INTRODUCTION

Pawnshop (Pegadaian) is a financial institution that served directly lend to the public with guarantee of good based on law of pledge. Task of Pawnshop based on Government Regulation no. 10 1990 is to provide service as a credit to the public. In providing services to public, pawnshop has a motto "Mengatasi Masalah Tanpa Masalah"

One of services in pawnshop is Auction Service. Auction is selling good open to the public directly or through electronic media by orally price or in writing, which is preceded by attempts to garner interest.

Current state of auction mechanism can be explained that the auction process in Pawnshop there are two periods and each period to closing time is four months. Each branch will announce auction schedule on the bulletin boards or published by mass media and radio. .

The some problems in auction process are : 1. Goods being auctioned are still limited geography, so it is difficult to sell by only local buyer; 2. The auction process nowadays still use conventional system, participants must come to Pawnshop and fulfill the registration; 3. Transaction of goods is still manual; 4. Difficulty of meeting between the seller and the buyer, participants must attend to the auction place; 5. Integration of the bidding process should be improved.

SOA is software architecture based on major concepts of application front-end, service, service repository, and service bus. The service consist of engagement, interface and implementation. Major products of SOA are shown in figure 1 [2]
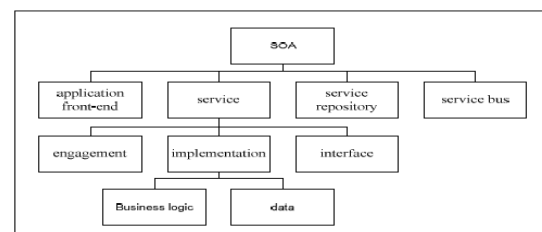

Fig. 1 Major structure of SOA

The improvement goals of designing and building Integrated Auction Service System are : 1. System allows participants to search goods and remaining goods in online auction; 2. System broadcast information of auction schedule via SMS Gateway and online announcement; 3. System allows participants and general public to know the progress of the auction process; 4. System allows dealing of bargaining process without presence of participant in

Pawnshop; 5. System compeleted with online payment to facilitate online transaction.

II. AUCTION SERVICE SYSTEM

For the present, a participants must come directly to Pawnshop and do bargaining process in this local area. Unlike existing auction service, Integrated Auction Service System, allows real-time auction information and process.

A. Analysis of the requirements of Integrated Auction Service System.
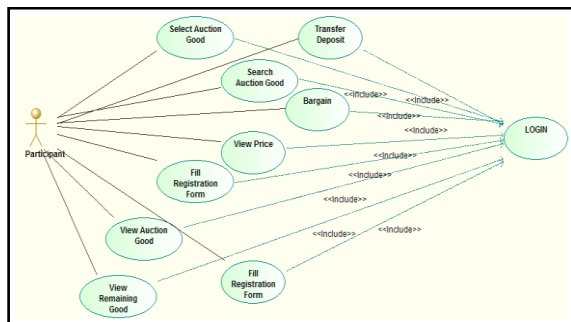Use case diagram is used to define area and requirement of system.

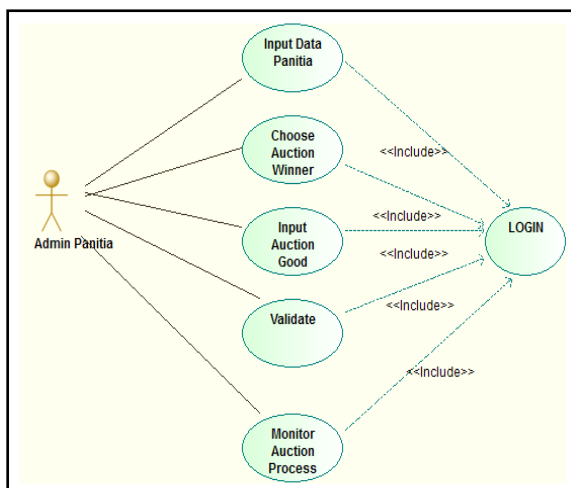Fig. 2 Use Case Diagram for Participant

Fig. 3 Use Case Diagram for Admin

From the use case diagram, participants can do select auction good, transfer deposit, search auction good, bargain, view price, fill registration form, view auction good, view remaining good. And Admin can do input data, choose auction winner, input auction good, validate and monitor whole auction process.

B. Definition of Integrated Auction Service System.
The pawnshop of Surabaya City has a task to conduct auction. Improvement will be conduct in Auction area. It aims to assist public that want to buy a good in auction easier and without presence of participants to Pawnshop. This step described in service blueprint. Proposed automation system covers registration process, auction process, winning process, giving notification and monitoring auction process

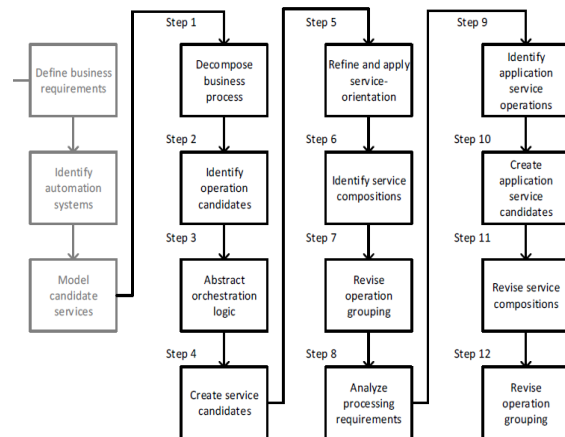### C. Modelling of the Service Candidates

Fig. 4 Service Modelling Process Proposed on Thomas Erl SOA Methodology

There are some steps in service modelling as in figure 4 proposed on Thomas Erl SOA Methodology.

Decompose Business Process has been done in the previous activity that is service blueprint. Service candidates and operations can be derived through analyzing detailed process of each use case. These can be abstracted at two service layers (business service layer, orchestration service layer) for effective implemetation.

Business service layer is consisted of business service that embody business service model directly as vital element of SOA. It is general that act as controller who mix application service. This layer can be classified task centered business service that encapsulate preceded business entity [1]. This table show business service layer of Auction System.

Table 1. Business Service Layer

	Service Name	Operation
Entity	Auction Good	Auction Good-related service
	Participant and Deposits	Participant and Deposits-related service
Task	Auction Process	Auction Process-related service
	Deposits and Payments	Deposits and Payments-related service

Orchestration service layer achieves process role among SOA component. This layer is consisted of process services more than one, and these process services mix business and application service according to business rule and business logic that is had inside process. Orchestration abstract business rule and service practice order logic from other service, and improves agility and reusability [1]. In fig.5 orchestration service layer of Auction System.
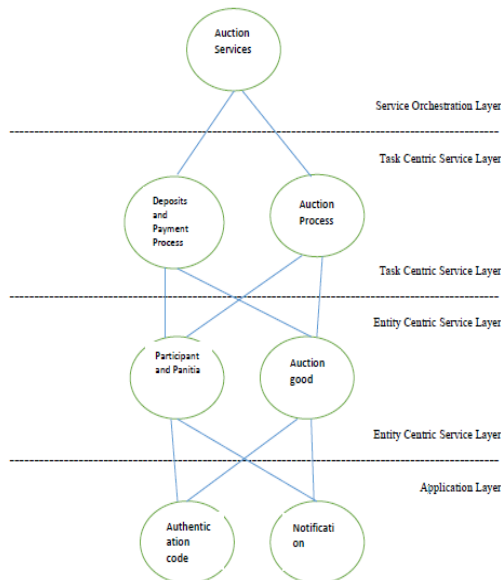

Fig 5 Orchestration Service Layer

III.   DESIGN AND PROTOTYPE OF INTEGRATED AUCTION SERVICE SYSTEM

A. Configuration of Integrated Auction Service System

Businesss Process Layer executes business logic as combining services within Integrated Auction Service System, for interface with same Provider's system and of the other Provider

B. Data Design and prototype of Integrated Auction Service System Source

To perform the service oriented design, it is used Windows Communication Founcation (WCF) as the core standard and the SOAtechnology. The main component of WCF architecture can be seen in Fig 6.
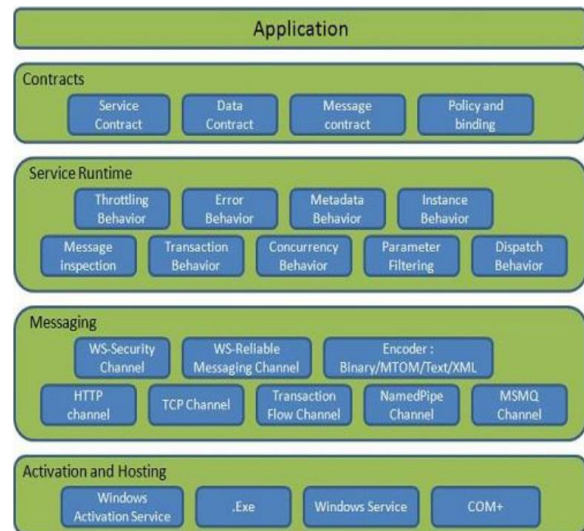

Fig 6 Windows Communication Founcation

Integrated Auction Service System was design by means of WSDL, XML-based language that describe Business Service. WSDL define messages (both abstract and concrete) are sent to the webservice, digital collections of the messages (port type, interface), how the specified port type used of wire protocol and where the service is placed. The Auction WSDL can be seen in fig 7 & 8
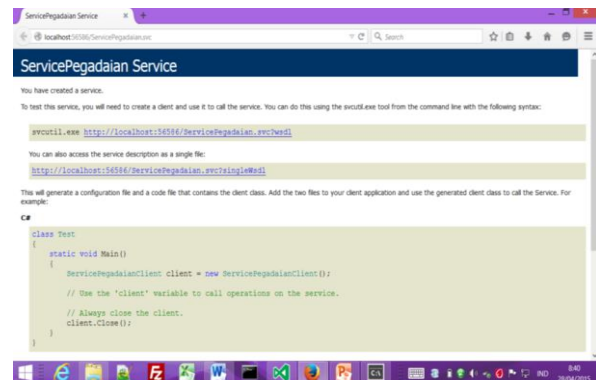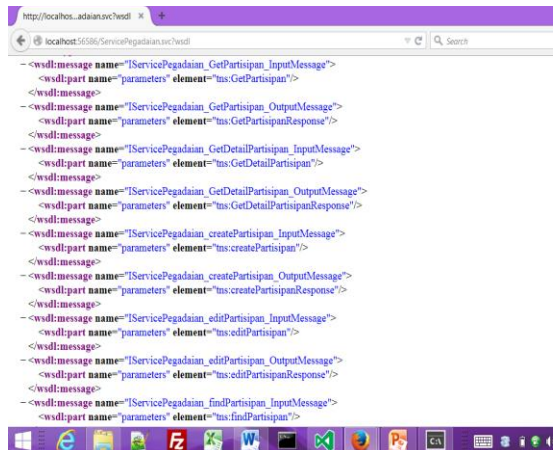

Fig 7 Auction WSDL

Fig 8 Auction WSDL

IV. CONCLUSION AND FUTURE RESEARCH

This paper proposes design method of prototype Integrated Auction Service System, as top-down SOA delivery method was employed to the Auction service, one of the Pawnshop services. And WSDL, structural element of web service, was employed as a design service.

Integrated Auction Service System based on SOA for business models, which this paper proposed, allows public to acquire request auction information quickly and bargain auction process easily. In addition, as it allows participant accross area to participate theauction, therefore it will contribute to increase selling of auction good. From a point view about IT, as it allows service for standardization reuses will be bigger, therefore efficiency will increase.

For future research, it can be research SOA related standard technology and SOA platform for implementing prototype of Integrated Auction Service System designed in this paper.

REFERENCES

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