Ecommerce Application Based on Dealer Agent in Cloud Computing Environment

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Abstract

Building secure ecommerce dealer agent mechanism transaction in cloud environment is an enhancement mechanism of Ecommerce system which provides market oriented approach for business using cloud computing environment. The software agent ecommerce system based on cloud . The main aim of the paper is to create dealer agent mechanism based on ecommerce cloud that allow pro-active and personalization including agent and dealer with the profile that are maintained independently. The proposed aim of this paper is to give the respond for the request initiated for the product as services initiated by buyer and delivering them appropriate service. To start with web services enables the agent to service the product JAX-WS (web service) is used. Trading system is brought in a sense enabling trading. Direct payment is the default feature for buying product which then security concern is solved by PayPal sandbox implementation for secure transaction. The load impact performance of individual website is measured by using Load impact tool.

Keywords

Software Agent, dealer agent evolution, cloud agent based test, JAX-WS

1. Introduction

The mechanism for Ecommerce dealer agent transaction that enables business minded approach for the buyers which is carried out from cloud computing .The main aim of this paper is to implement the mechanism such that the dealer is the actual ecommerce sites who will add its own product to the agent database. Agent is the one who will maintain all ecommerce sites product database and payment database. Agent searches the product in which ecommerce site the product is available. To start with Web Services enables the agent to service the product. Trading system is brought in a sense of enabling trading between agent & dealer. Direct payment is the default feature for buying products. The problem which occurs for searching the information about trading partners in the business area related to globally needs the intermediate for electronics to guide and immolate the services.

i) To develop dealer agent mechanism.
ii) For the implementation of the algorithm that connects buyers and sellers, search algorithm for searching the services. Many existing works in Cloud computing focus on the development on infrastructures and tools for pooling together computational resources, this work complements and supplements existing works in Cloud computing by introducing "agent-that works in cloud computing". SLA does cloud provider guarantee [1].

2. Enterprise to Cloud to End User

In Figure 1, in this scenario, an enterprise is using the cloud to deliver data and services to the end user. When the end user interacts with the enterprise, the enterprise accesses the cloud to retrieve sending the results to the end user. The end user is the buyer or consumer. Cloud Open should be customer driven [2].

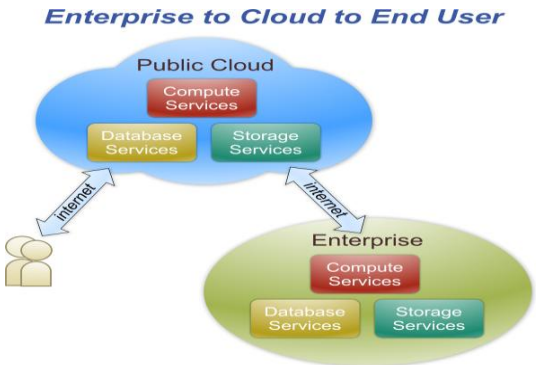

Figure 1: Enterprise to Cloud End User

- Identity: The cloud service must authenticate the buyer.
- An open client: Access to the cloud service should not require a particular platform or technology.

- Federated identity: In addition to basic the identity needed by an end user, an enterprise user is likely to have an identity with the enterprise. The ideal is that the enterprise user manages a single ID, with an infrastructure federating other identities that might be required by cloud services. Application can move to the cloud to improve efficiency & satisfy organization security [3].
- Management and Governance: Public cloud providers that make it very easy to open an account and begin using cloud services.
- Security: Any use case involving an enterprise will have more sophisticated security requirements than one involving a single end user. Similarly, the more advanced enterprise use cases to follow will have equally more advanced security requirements.
- Data and Application Federation: Enterprise applications need to combine data from multiple cloud-based sources, and they need to coordinate the activities of applications running in different clouds.

SLAs and Benchmarks: In addition to the basic SLAs required by end users, enterprises who sign contracts based on SLAs will need a standard way of benchmarking performance Each Service is an independent software entity with a well defined standard interface that provide certain functions over network [4].

3. Agent in Ecommerce Based Cloud

The agent is the mechanism that has the capability to determine the needs of the buyers and fulfill their objectives. Interaction between buyer and sellers takes place with software agent. Enhance public cloud for small to medium scientific communities as service provider to utilize elastic [5]. Proper coordination and cooperation is required for successful business between dealer and agent. Dealer process to coordinate is nothing but the state to achieve the implementation process. Cloud computing features are to serve resources to the buyers or customer. The service level agreements are established between providers and the consumers, and then the service is delivered [6].Contract is establish between buyers and sellers which is then from cloud computing. Agent based technology is emerging as a powerful para diagram for developing ecommerce system [7].For automation and the activities of polling services of product in cloud agent protocols are used. Difficulty of finding information about trading partners in global business arena accentuates the need for electronic intermediaries to assist, navigate, and mediate the invocation of these services [8].

This paper includes the following cloud agent which is as follows:

3.1. Services of Agent in Cloud

Services that are concern with cloud agent are the challenging task for dynamically arranging sets of services to number of service provider for formation of single service to the customer to be delivered. For the cloud agent services following works to be adopted:

i) Record database is maintained for all the service provider sites (dealer sites).
ii) Payment transaction is maintained for all the dealer sites.
In the requirement phase of service, for service consumption the agent software is accomplished. Agent based cloud computing is concerned with designing and development of software agent for cloud service discovery [9]. SLA generation and direct payment modules are handled by enterprises effectively [10]. A service is different from a traditional software artifact in that it's autonomous [11]. Cloud Participant Cloud computing for composition of service required. Participants of cloud that are (Agent, consumers, dealer ecommerce sites) required interaction and coordination between them. Protocols are implemented for the interaction between agent, ecommerce sites and consumers. Cloud agent software for the services of cloud composition is implemented used Java (jdk 1.6) framework. The software consists of web services (WSs), Agent Resources (ARs), Service Providers (SPs), Dealer; broker Agent (Bas), Consumers.

3.2. Resources Agent Based

Agent resources controls and manages the resources to access. The agent-based brokering system exposed in this paper partially solves the connection problem in the product brokering and the merchant brokering stages of ecommerce [12]. The agent middle-ware is primarily designed to act as a bridge between distributed physical networks, creating an agent-friendly communication infrastructure [13].The resources accept the ecommerce dealer site request and it then grant the requirement to consumers through the ecommerce dealer sites. It manages the resource and had to handle the resource to be organized service provider agent accepts the task for the objective to search for the service product request. Agent system in Ecommerce situated in an environment and capable of flexible [14].It also interacts with ecommerce sites for service providing will serve as a valuable resource for providing leading technologies, development, ideas, and trends to an international readership for researchers, engineers, and business leaders in the field of services computing

[15].Consumers, that request for the services of product required to the service provider (Ecommerce dealer sites), if request not found in the dealer site then the site request to agent and through the requested site only the product service is received to the consumers.

4. Dealer Agent Architecture Cloud Ecommerce

In Figure 2, Cloud Enterprise comprises of Agent and the dealer (Ecommerce Sites) on the cloud with respective products along with enterprise service. These services include Cloud service, trading system, and direct payment. Cloud services allow the buyer to purchase or find the product to access their computing needs. Trading between the Agent and the Dealer is handled by trading system, which use the controller to search the particular ecommerce site with respective to the product needed for the buyer . The Cloud providers will need to consider and meet different QoS parameters of each service. Agent based cloud computing is concerned with designing and development of software agent for cloud service discovery . SLA generation and direct payment modules are handled by enterprises effectively.

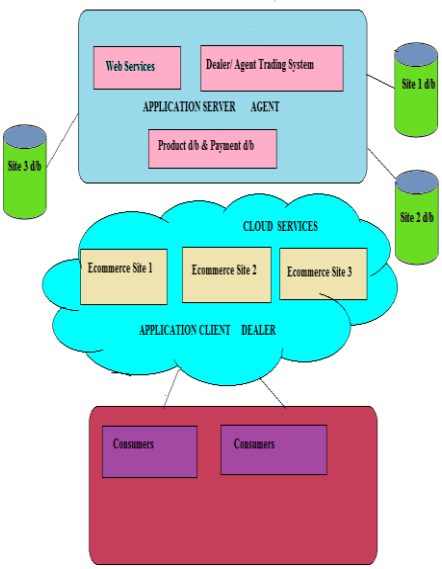

Figure2: Dealer Agent Cloud Ecommerce Architecture

4.1. Cloud Enterprise Working

Cloud Enterprises (in Figure 1) comprises of the entire agent and the dealer on the cloud with respective products along with enterprise service. These services include web services, trading system and direct payment. Web services allow that provide services to the customer through dealer site. Trading between the dealer and customer is handled by trading system. SLA generation and direct payment modules are handled by enterprises effectively. The difficulty of finding information about trading partners in the global business arena accentuates the need for electronic intermediaries to assist, navigate, and mediate the invocation of these services.

4.2. Service Provided by Cloud Enterprise

The three main features involved under trading by the enterprise are web services, trading system and direct payment. These features along with the building up of service level agreement will constitute the delivery of requested product and handling the agreement between dealer and customer.

5. Evaluation of Dealer Agent Mechanism

The connection between the buyer and the sellers address the buyer to upload the information for the profile database and trading electronic purpose. In Figure 3, the seller buyer mechanism process are carried out with stages of In Figure 2, the seller buyer mechanism process are carried out with stages of

i) Connection between buyer and sellers (Algorithm)
ii) Request of service evaluated
iii) Request that matches filtered
iv) Assigning Service request to Buyers

5.1 Buyer and sellers Connection

Algorithm for Buyer and Seller

Input: { User id} , {Password}
Output: Connection Established
Processing:
If User id & password >4 < 20
Begin
/* Criterion1 If user id & password exists in dealer d/b */
Begin
Set Services
/* Dealer site will open for Access */
End
{Connection}=new connection generated
If connection generated
/* Criterion 2. Begin
Set Trading process */
Else if User id & password not match
/* Then show error message “Please enter correct user id & password”.*/

End
End
End
Else
Begin
/* notify Error msg “Please enter user id & password >4 >20 */
End

Connection is issued between buyers and seller for the task to be accomplished for the purpose of electronic trading and electronic business. Predefined process that is determined for the purpose of connection, this stage receives the request from the buyer.
i) Requesting for the services of product.
ii) with profile details of consumers.
Criterion1. Before requesting for the product services the user has to sign up with their new user id and password so that the consumer’s database is also maintained and connection that is established between buyers and sellers.
Criterion2. For the trading Purpose the connection get established.

5.2 Service Request evaluated.

The connection gets established service for the product request is evaluated, where the consumer or buyer enters the product detail. The product details are broke into words. The product request is done with the basis of product type, product name. Search query task take place where the product will be searched.

Algorithm for Service Request Evaluated

Input: {Product type}, {Product name}, {Product Price}.
Output: Service request evaluated
Processing
Step1: Buyer Enters Product details
Step1: Search string break into words
Step2: Compose the search query targeting known data fields like (product name, product type)
Step3: If word like product name (%Samsung %) and product type (%mobile %) found
Begin
/Result will be displayed related to Samsung/
End
If product type like = mobile
Begin
*/Then Notify “Result displayed for all mobiles” */
End
If product name like=%Samsung%, product type like =%mobile%, price <5000 >10000
Then display Order by Price in Ascending Order & Order by Dealer.
Begin
Result will be displayed
End
Else message display record not found
If product request forwarded
Then search query forwarded to cloud agent
Go to step 1
End
End

If the product found in the particular site then the service is forwarded in case if the product is not found then the cloud agent that maintains all the product detail will gather the information about the request to be assigned. Service that is evaluated based on the criteria the buyer set based on the price also for product price that that buyer requested is for 5000 or less than 5000 the search will be taken place accordingly.

5.3. Product Search Match

The match request is searched in the cloud agent system. The request is from the dealer site not from the customer directly. The input is product type and product model. This stage that indicates the selection cycle completes for the request and the connection between buyer and the seller. The match searching stage together provides the path that is optimized which allow buyers and sellers to go through cycles for connection. Product search is done for the site perspective so that the concern site can provide the services to consumers or buyers. The web services communicate between the applications. The service that is assigned is described with the help of algorithm.

Algorithm for Product Search Match

Input: {User id}, {Password}, {Product Price}, {Product Type}
Output: Search matched
Step1:.Enter user id and password login
Begin
If product price < = Product Price
Begin
*/ Show match found */
End
If product type =(%Videocon%) & price < = 5000
Begin
/ Notify Match Found Detail/
Else
Begin
*/ Notify Match not found */
End

5.3 Assigning Service Request

For the connection that is established and the search that has taken place if the product found then the buyers receives the services of product type.

Algorithm for Assigning Service Request

Input: {user id},{password}
Output: Product Service assigned
Processing:
Step1: Product added into cart
Step2: Displaying message with product type product name, product price, and quantity, total.
Step3: Gross total amount displayed
For productid = 1;
Product id < Cartlist.Size;
Begin
Total= productprice*quantity
Grosstotal= grosstotal + Total
End
Step4: Checkout.

Once the customer select the product from the catalogue the product that get added into cart. The message is displayed with product name, Product Detail, Product Price, Quantity and total. The gross total is calculated and the amount is displayed. Total is calculated
Total= Product Price * Quantity
When the total is been calculated the consumers checkout with transaction.

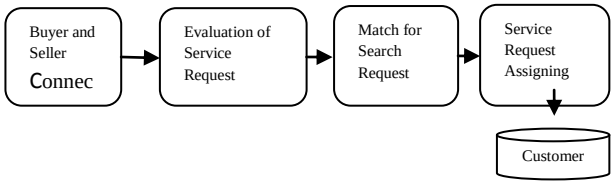

Figure 3: Stages of Dealer Agent Cloud Ecommerce.

6. Agents as Distributed Entities

A software agent is a computational entity that acts on another entity's behalf to perform a task or achieve a given goal. Agent systems are self-contained software programs that embody domain knowledge and behave with a particular degree of independence to achieve specified goals. They're designed to operate in a dynamically changing environment. Agents typically offer features such as autonomy, pro-activity, communication and cooperation, and learning [12]. Although a single agent can perform a given task, the agent paradigm was conceived as a distributed computing model in which a set of agents interact with one another, exchanging information and cooperating to perform complex tasks requiring interaction, intelligence, adaptation, and dynamicity. This means that even though we can define an agent in isolation, to fully exploit agents, we must consider them to be entities acting cooperatively by exploiting the AS paradigm. In fact, it's difficult to imagine an agent existing and operating only as a stand-alone entity without interacting with other agents (real or artificial) in its environment negotiation in price [13]. Additionally, although information agents, or personal agents, are intended mainly to solve problems as stand-alone entities, their behavior can improve and they'll better achieve results if they cooperate with other agents to receive information, delegate task execution, or exchange knowledge that improves their role and contribution. Given these considerations, the social dimension of agents is an essential feature. The features of software agents are typical of decentralized computing paradigms. In fact, ASs share several characteristics with other distributed paradigms such as actors (which are essentially agents' progenitors), concurrent objects, P2P networks, grid computing, sensor networks, autonomic computing, and cloud computing. At the same time, agents possess some properties that differentiate them from other distributed computing models. Their respective research communities should exploit commonalities and differences among these models to integrate the use of technologies that are based on them. Dealer Agent mecahnism application is created by using the following technologies; Platform used is Windows Server 2003, for designing the application, software technologies used are JavaScript and Java EE, for backend support database technology used is SQL Server 2005, AJAX is used as web services used for the application.

7. Result Analysis

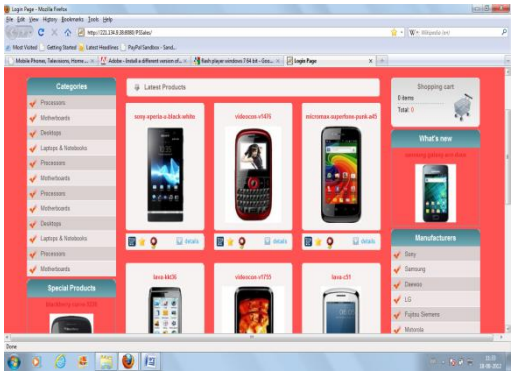

Figure 4: PSSales Website

The above shown website in Figure 4 is one of the Ecommerce website (i.e., ProductShoppingSales.com) where in customer can purchase products. This site

maintains all types and brands of mobiles. In this site the customer gets login with its user id and password. Another page will appear where in customer details need to be filled with signup option provided in this site. With this option the customer is added into this site.

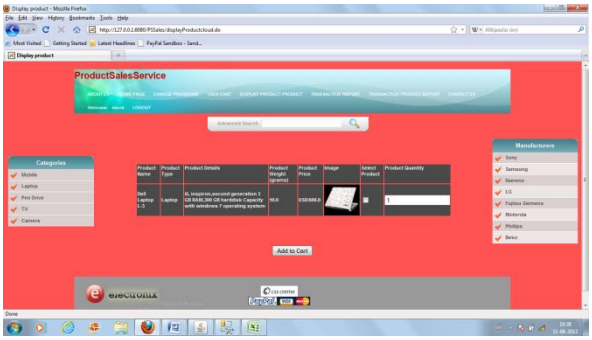

Figure 5: PSSales Website displaying product

From the above Figure 5 ,the above shown PSSales website is providing the requested product to the user.PSSales does not have requested product with them, when the user request came for the product. Since the site maintain mobile but the request is for laptop.

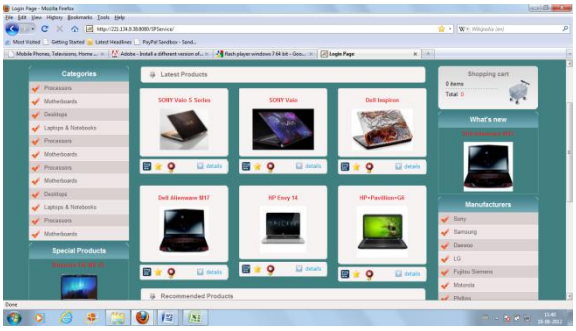

Figure 6: SPService Website

From the above shown site in Figure 6 is SPService.com where in customer can purchase product. This Site has all types and brand of laptops. The same type of transaction which is shown in PSSales.com can be shown for this website also. The agent site searches the product in the entire dealer website but the product is available in this site. The internal Dealer-Agent mechanism will let Agent to provide necessary products to the user requested website. Like-Wise Cloud environment has been established by deploying this application in cloud.
Query used in PSSales_Database:

USE [PSSales_Database]

Select * from [PSSales_Database].[dbo].[ItemMaster]

Where ItemName = 'Dell Laptop L-3'

Output:

Shows no data as there is no such product in web site.

Query used in SPService_Database:

USE [SPService_Database]

Select * from [SPService_Database].[dbo].[ItemMaster]

Where ItemName = 'Dell Laptop L-3'

OutPut:

Shows item data as the item is found in the database.

From the above query we can show that Database "PSSales_Database" does not have 'Dell Laptop L-3' item, where as Database "SPService_Database" has the item. Database "PSSales_Database" belongs to PSSales web site and Database "SPService_Database" belongs to SPService web site. User request for 'Dell Laptop L-3' item came to PSSales web site, but PSSales web site doesn't have the item so agent web site using dealer agent mechanism searchs user requested item in other web sites in cloud environment. Here agent web site provides the user requested product from SPService web site. Like-Wise cloud environment has been established.

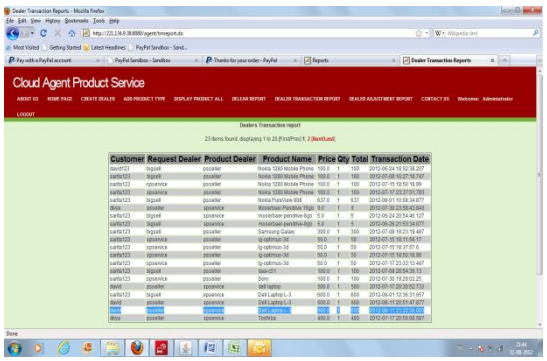

Figure 7: Agent Website Transaction Dealer Report

From the above shown site in Figure 7 is Agent website. After product is been assigned to dealer the above report displays the report of requested dealer and product dealer with product name, quantity, total price and transaction date. This report is generated by this site for payment between dealer website through Agent website.

7.1. Load Impact Measure

This is used to check the load impact of the website. The load testing tool generates simulated user traffic to a website. Users can simulate virtual users who are trying to load the web pages at the same time. While simulating

the traffic, the tool records how fast pages are loaded from the server. This lets users know how fast the site is experienced by a user when it is being accessed by many users at the same time. Results are displayed in real time throughout the test process. The tool is cloud-based and provides on-demand load testing.

Figure 8: Load Impact Performance of PSS Website

From Figure 8, we will see the load impact of one of the dealer website http://221.134.9.38:8080/PSSales/.The above graph shows that the user load time is 1.16 seconds for 50 Client who are active

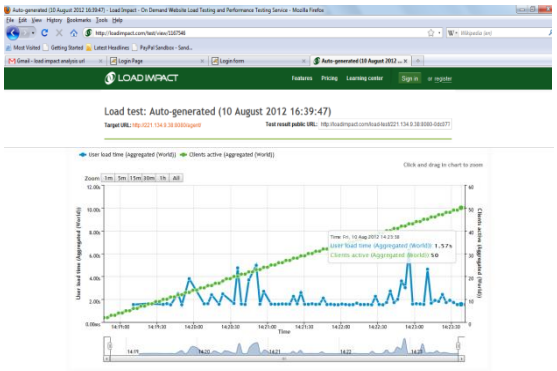

Figure 9: Load Impact Performance of Agent Website

From Figure 9.shows the load impact of the agent website where 50 client accessing the website at the same time with 1.57 seconds user load time.

8. Conclusion

The paper focuses on developing business service because of core concept of cloud computing revolves around providing software as service. The services handled request and responses by using AJAX web services. Our paper involve services namely web services, trading system and direct payment. The payment transactions have been integrated with PayPal sandbox, which provides in-built security for secure transaction. The system is highly scalable and user friendly. Almost all the system objectives have been met. All phases of development were conceived by using methodologies. The paper is executed successfully by fulfilling the objectives. The application is deployed in cloud publicly which provides access to this application from any part of the world. Through this project we have explained how websites are in cloud environment. If a user comes to the websites, the website provides the features which will not let the user to be dissatisfied. As all range of products will be found through the websites which are in cloud. The cloud represents one of the most significant shifts that computing has gone through. As we move towards the cloud, we will discover a new service-based world, where many words that were once common in the average IT shop – like servers, data centers, OS, middleware and clustering – will get erased.

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