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Agent Based E-Barter System

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Abstract: Agent Based E-Barter System is a multi-agent e-commerce barter system for performing exchange of products through the interaction of autonomous mobile software agents that act on behalf of users. The agents register the services they provide in the Document Facilitator. Document Facilitator provides the yellow page service. Agents search for agents providing services in the Document Facilitator. The agents move to the residing place of the service providing agents to perform purchase or sale. Barter system helps software agents find ample choices for performing exchange. This system is Implemented using JADE as per FIPA specifications.

Keywords: Software Agents, Barter System, JADE, FIPA.

I. INTRODUCTION

E-commerce is defined as the use of computers and electronic networks to organize shopping with customers over the internet or any other electronic network [1]. People can now sit at their home and get anything at their fingertips. Several approaches were made to make the various steps of commerce easier for everyone. Online shopping websites were one of those approaches. The long time consuming process of searching the catalogue was a tedious job and people never loved it [3].

Agent Based Barter System is an e-commerce system which allows mobile software agents living on separate platforms (or machines) come to a virtual marketplace and perform exchange of products .The proposed system uses multiple agents communicating with each other performing tasks allocated to it.[8] The current e-commerce system requires users to sit in front of a computer for hours in search of a product they wish to buy. Moreover they have to search different sellers and choose a seller that offers the least price. This herculean task is time-consuming and require users to pay money when the purchase or sale is done.

The proposed system implements a multi-agent e-barter system that supports users to deploy mobile software agents on behalf of themselves to perform commerce over the network [2].Here exchange of products is done so that money is not a factor. Agents have to interact with each other using messages to find good matches. This system mainly deals with finding suitable agents and matching products for exchanging and also to find the best choices among all the agents present in the market. This system supports creation of several buyer and seller agents on behalf of the user who intends to buy or sell a particular product respectively.

The agents are allowed to publish the services they provide in the yellow page service provided by Document Facilitator. The agents who wish to avail any service can search for those agents that provide the services it wish to avail [6].

The agents are able to communicate with each other using messages and also are incorporated the power of migration to them so that they can move among different machines [7] irrespective of platform. Agent cloning helps create multiple copies of the same agent. These agents can also negotiate over price with each other and ultimately perform purchase or sale.

Software agents can clone themselves to generate any number of copies as per the need. They have the power to migrate from one container to anoth.er on behalf of the user.[2] Barter system allows agents to interact with each other, find suitable products and exchange them. The agents

II. SYSTEM ARCHITECTURE

The proposed system is implemented using JADE (Java Agent Development Environment) as per FIPA (Federation of Intelligent Physical Agents).JADE provides excellent platform for agent creation and monitoring. Agents created on multiple platforms interact with each other to find the exact matches for bartering.
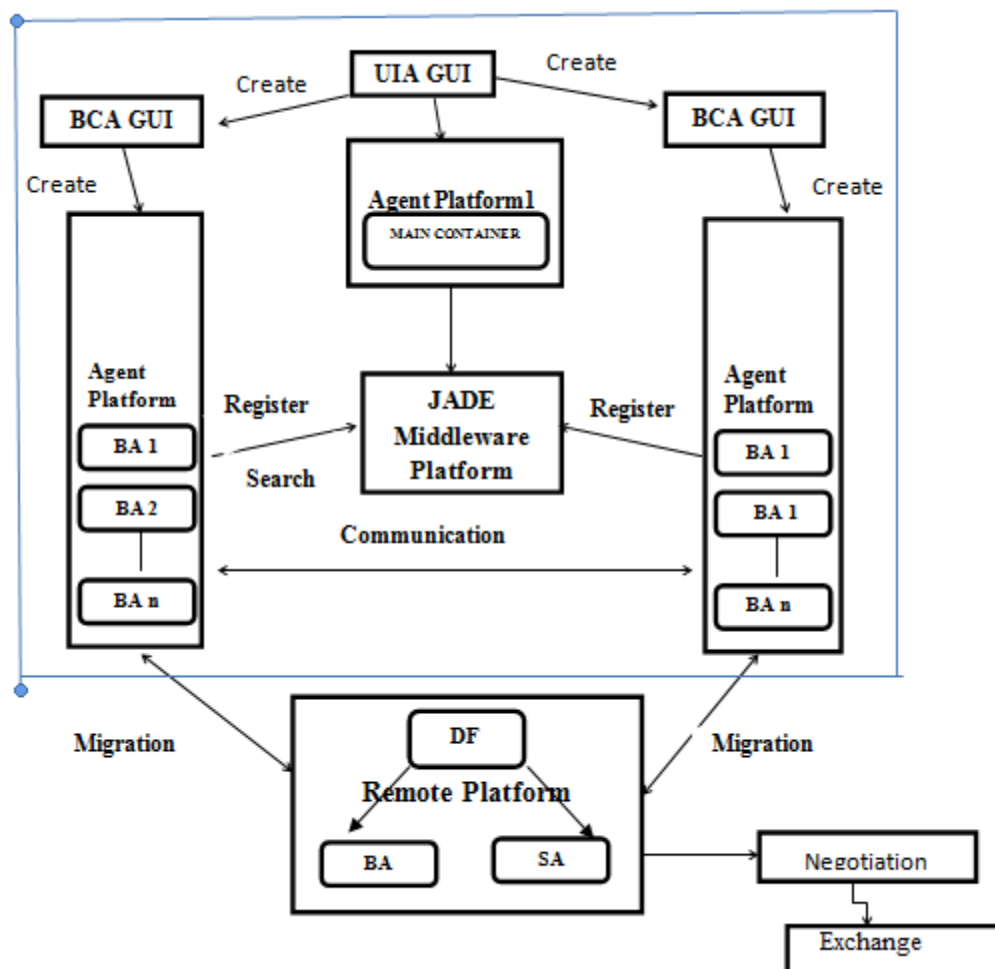

Fig 1: System Architecture

III. MODULE DESCRIPTION

The list of agents present in the system and their functions are described as follows:

The Book Shop Agent is created by The User Interface Agent (UIA).

The Book Client Agent (CA) is created by the User Interface Agent (UIA).It is used by the user to deploy Book Buyer Agent to buy a book. It allows the buyer (user) to enter the details of the book he wish to buy. [3]Details include book name, author name, publisher, year and other important details.

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The Book Buyer Agent (BA) is created by Book Client Agent (BCA).One agent is creates for one product. It includes the name of book to buy and the price range. Price range denotes the minimum and maximum price of the product within which it is willing to perform exchange.
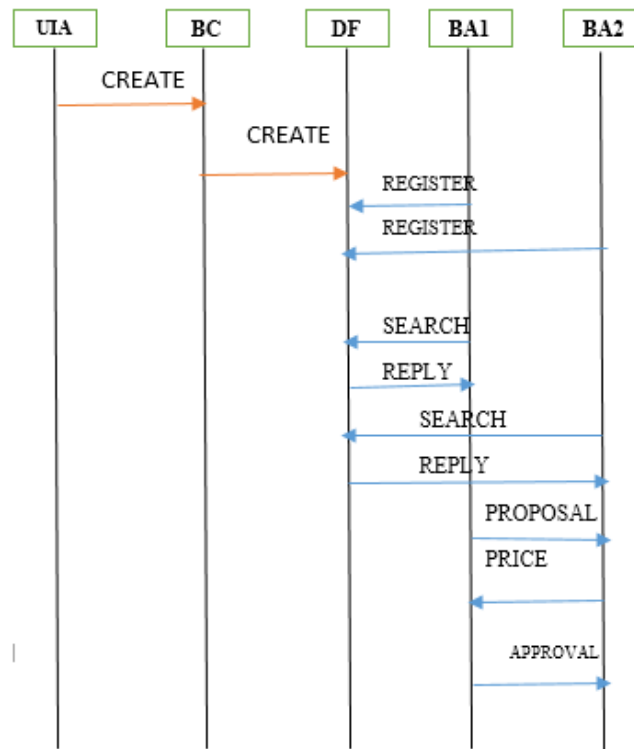

Fig. 2 Agent Interaction

Fig. 2 shows the interaction between different agents that are created in the system. Interaction are done using FIPA ACL (Agent Communication Language).

IV. IMPLEMENTATION

The domain chosen for implementing the system is the sale of books mainly English novels. The system is implemented in two machines (two separate JADE platforms).

The Client Agent is created in one platform (in one machine).The client agent was allowed to enter the details of the book he wish to buy. The details included name, author name, publisher, year and Price range. Price range has two parts mainly minimum price and maximum price. Minimum price is the value point below which exchange cannot be done. Maximum price is the maximum value of the product that should be exchanged with the product. On the remote platform i.e. platform 2 on another machine another client agent was created.

The Client agent provides an interface for creating buyer agents. For each book to buy a buyer agent is created. The buyer agent searches the Document Facilitator of the current platform for any agents that provide the service it wish to get. It can also register the service which they are providing in the document facilitator. Agents search in the document facilitator for service providing agents.

The buyer agents migrates to the remote platform and registers in the AMS (Agent Management System) of the remote platform. [1] It search the Document Facilitator of the remote platform for any agents that provide the service it wish to get. If there are any seller agents that wish to exchange book the buyer agent wish to buy are identified.

If multiple sellers that are present there that provide the same book, then the seller that provides the book at the lowest price is chosen. The agents then check whether the other agents are within their acceptable range and the author name matches.

If there are many machines, the buyer agent is cloned and is migrated to all platforms that host seller agents. The agent finds the seller agent that provides the best price at each platform for a book and exchanges the book from the seller agent that provides the least price provided the price is lower than that the buyer is willing to pay. If the sellers provide a price higher than what the buyer is willing to pay, those seller agents are not considered. The version of JADE used is 3.5.Inter platform mobility service add-on need to be incorporated before running the program.

V. CONCLUSION

Software agents can be used in different application fields like e-commerce as they possess the capabilities like mobility, autonomy and reactivity.

Advanced multi- Agent e-barter systems aid users to use intelligent agents in the field of e-commerce by automating it. This e-barter system allows a friendly set of customers exchange their books without sitting long hours before a computer. This system proposes agents that can clone themselves and migrate to other platforms. The use of intelligent mobile software agents makes the system perform better compared to conventional e-commerce practices.

Multi-Agent e-barter System has been implemented JADE framework and java. Intelligent agents (also called bots) were used to implement a multi-agent system where several agents live and interact with each other freely through migration and negotiation. They work together for performing commerce.

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