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Multi-agent system with case-based reasoning in E - Commerce Applications

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Abstract: **E-commerce, which goodies commercial actions by on the web, is the most notable example and also intimately related to our actual life. However, individuals are still cautious about utilizing such handy tools. This really is originated from concerns on security of their details. Inherent weak points of the Web and trade-offs between overall performance and protection increases users' distrust. Large numbers of communications that contains user's confidential information are confronted by malicious actions. Thus it really is obvious that people should commit ourselves to be able to designing safe E-commerce programs but not diminishing efficiency. To achieve an efficient use of group-QKD mechanisms to secure E-Commerce applications, we propose to integrate quantum key distribution into main group key protocols. It gives a few advantages and commitments of the utilization of quantum Key Distribution to implement security level. A few possibility approaches to execute arrangements in view of quantum key distribution are proposed.**

***Keywords*— E - Commerce Application, Unprotected Group Rule Protection, Quantum Key Distribution**

1. Introduction

Quick change of data advancements and across the board dispersion of correspondence systems by means of the Internet have being changed our day by day lives in a radical and electronic way. Online business, E-government, E-office, E-learning, and so forth, those terms have been recently acquainted with represent the effects and changes of our social and social conditions from them. Additionally, clearly these patterns toward electronic world would be progressively quickening. Among them, E-business is the most unavoidable and unmistakable region. Online business is the business procedure of offering and purchasing the items, merchandise and enterprises by on-line correspondences. It can be exceptionally helpful in decreasing business costs and in making open doors for new or enhanced client administrations: clients feel accommodation to arrange and can gather a lot of data to analyze comparable to items which are made from the diverse merchants, sellers can exchange comprehensively and find new market with chop down venture, monetary offices like bank can lessen exchange cost. Despite those propelling advantages, a few hindrances interfere with the advancement of E-trade. Those are manhandle and abuse of data and disappointments of frameworks. The wellsprings of such dangers originates from a few factors, for example, pernicious assaults misusing outer and inner vulnerabilities, remissness of clients and cataclysmic events. On the off chance that those dangers are acknowledged, we confront a few of all shapes and sizes misfortunes: coordinate budgetary misfortune, loss of private data, loss of client certainty, loss of business opportunity, burden, and so forth.. From above discourses, obviously we should give careful consideration to security in E-business. Secure E-trade by and large utilizes data security capacities, for example, validation, privacy, and information trustworthiness to manage such dangers.

Normally, it infers the utilization of cryptographic-based innovations, for example, encryption and computerized marks, particularly when profitable or private data is imparted over open frameworks, or when the potential for denial of exchanges is unsatisfactory. As a down to earth matter, secure E-trade may come to mean the utilization of data security components to guarantee the unwavering quality of business exchanges over uncertain systems. What's more, secure E-business ought to be productive. We for the most part respect that adding security advancements to E-trade applications corrupts their execution and builds exchange cost. It isn't best. Coming about nature of administrations and aggregate cost in the wake of coordinating security ought to be sensible to the partner parties.

2. Literature review

Research on intelligent agents ranges from theoretical, logical investigations to more practical, implemented applications. The issues that are being solved on each side of the spectrum, in general, are very different. On the logical side, much research goes into deriving. formal properties of logical systems, like completeness or decidability. On the other side, architectures, issues like scheduling and other design and implementation issues are investigated. Quite a number of researchers have made proposals for agent programming languages or agent design frameworks. Some of these languages, however, lack a clear and formally defined semantics, and therefore it is difficult to formalize the design, specification and verification of programs. Other types of languages are based directly on logic. According to Martin and

Odell [1992], business rules allow user experts to specify policies in small, standalone units using explicit statements. The term business rule can be understood both at the level of a business domain and at the operational level of an information system.

The more fundamental concept is business rules at the level of a business domain. In certain cases, they can be automated by implementing them in an information system, preferably in the form of an executable specification. According to "Software agents" [Nick Jennings, 1996] it describe the software agents as fastest growing area of Information Technology. They are being used, and touted, for applications as diverse as personalized information management, electronic commerce, interface design, computer games, and management of complex commercial and industrial processes. It describes properties of agents & fields where agents can be used.

According to "Task Characteristics and Intelligent Aiding" [Terri Lenox, 2000] describes the interactions between task characteristics and human agent interfaces in a team rendezvous route-planning task. The agents include an interface agent and two different task agents that perform similar tasks. The MokSAF interface agent links an Artificial Intelligence (AI) route planning agent to a Geographic Information System (GIS). Through this agent, the user specifies a start and an end point, and describes the composition and characteristics of a military platoon. Two aided conditions and one nonaided condition were examined. In the first aided condition, a route-planning agent (known as the Autonomous RPA) determines a minimum cost path between the specified end points. The user is allowed to define additional "intangible" constraints that describe situational or social information that should be considered when determining the route. In the second aided condition, a different agent, the Cooperative RPA, uses the same knowledge of the terrain and cost functions available to the Autonomous RPA, but restricts its search to paths within regions drawn by the user. In the unaided condition, Naive RPA, the user draws the route manually, then submits it to be tested against the terrain and cost functions for feasibility. Both aided conditions are superior to the control but differ in their relative effectiveness by scenario.

3. MAS In E-Commerce Applications

The intelligent agents plays important role in solving the real-time applications. The intelligent agent may be defined as the computational entity that's takes the input through sensors and works on the environment through effectors. The environment may be defined as set of information regarding the real-time application.

The ability of an intelligent agent is restricted by its knowledge, its type of the environments, and its point of view. Due to these factors, the intelligent agents are unqualified of tackling more multifarious, sensible and comprehensive problems. It may be done with help of multiple intelligent agents working together for a common goal. The collection of such intelligent agents is known as multi-agent system.

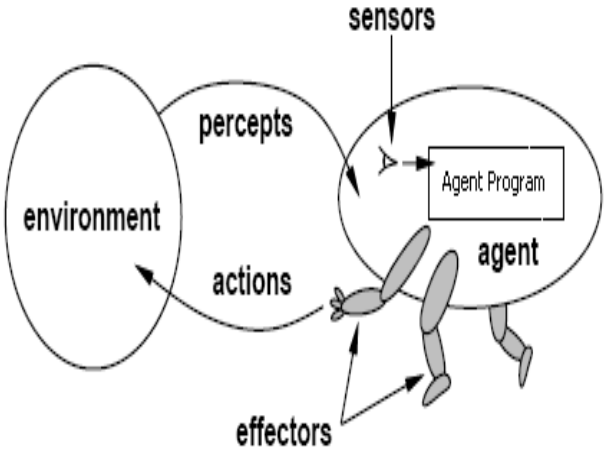

Figure 1 Intelligent Agent

The basis features of multi-agents are described as below:

a. The intelligent agents have a limited viewpoint having incomplete information or capabilities for solving the problem.

b. There is no global control system between these agents.

c. Data are decentralized in working environments.

d. Computation is asynchronous without corresponding with other agents.

These factors show the working mechanism of the multi-agent system [12]. Finally Multi-agent systems boost up the performance in the following areas in many areas by following factors as: (1) computational efficiency through concurrency, (2) reliability via redundancy, (3) extensibility of the agency by changing the number and capabilities of the agents, (4) maintainability (5) reusability of agents for resolving the problems

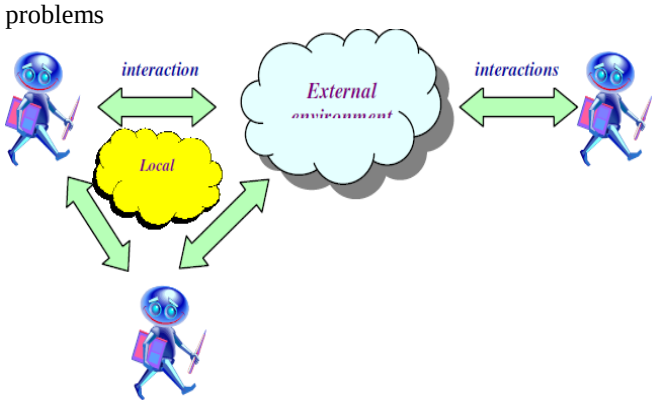

Figure 2 Multi-agent System

4. Result and discussion

We propose a model of a learning agent whose interaction with the environment which allows the agent to project itself into future situations before it takes real action. A supply chain is a network of autonomous entities, or agents, engaged in

procurement of raw materials, manufacturing and converting raw materials into finished Products and distribution of finished products. Distribution, manufacturing and purchasing organizations along the supply chain often operates independently and have their own objectives, which may be in conflict. The supply chain management (SCM) should ensure the objectives to deliver the right product, at the appropriate time, at the competitive cost, and with customer satisfaction in order to keep the competitive advantages. A perfect coordination among various functions always ensures success of SCM to achieve its main objective. We identify the elements in a supply chain, their features, and the challenges associated with SCM. We classify the elements in a supply chain as entities and flows. Entities include all manufacturers, logistics providers, electronic exchanges and all their internal departments that participate in the business process. These entities are essentially the operators in the supply chain. Flows are of three types: material, information and finance, and these are the operands in the supply chain.

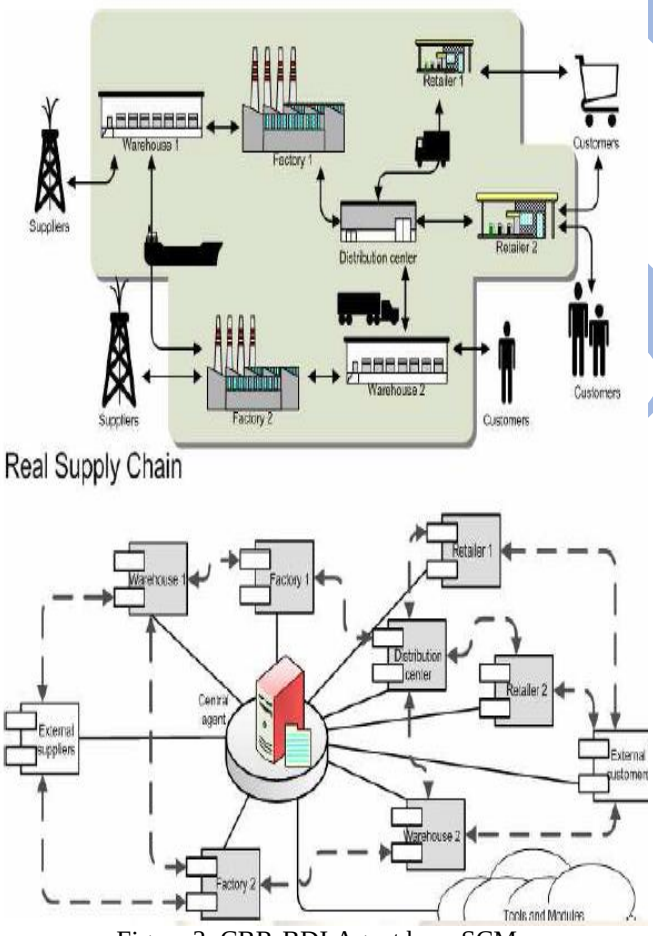

Figure 3: CBR-BDI Agent base SCM

These entities have three common features:

1. **Dynamic**: The supply chains are more flexible now. In today's business environment, there are no obligations for companies to be part of a supply chain for a certain time period and they may join or leave based on their own interest. This changes the structure and flows in the supply chain. Information in the supply chain e.g. prices, demands, technologies, etc. is also changing continuously.

2. **Distributed**: The elements are distributed across various geographical locations. The planning and operating systems used by an entity may also be geographically distributed e.g. there may be a dedicated inventory database residing at each warehouse of a manufacturer. The SCM related information might even reside as rules-of-thumb with the people responsible for performing the various tasks in the business process.

3. **Disparate**: The entities in a supply chain use different systems built on different platforms for planning and management of their business. Information pertaining to the various elements is also disparate in form.

The intelligent agents handle the flow of materials, product & information flow with mobility feature. The case-based reasoning provides the mechanism to take the decisions in sourcing, inventory, transport and demand forecasting. Hence CBR-BDI agents are more suitable for implementing the supply chain system.

5. Conclusion

SCM has become the key strategic area that has direct impact over the success of any enterprise in today's highly competitive business environment. We have represented the supply chain and related problems through a unified, flexible, and scalable framework. The CBRR-BDI agent based SCM is capable of taking decision on basis of past experience. The system maintains the flow of information between the entities i.e. suppliers, manufacturers, distributors, retailers and the customers.

In future, the distributed database may be applied for storing the case-base for every agent. This factor will provide the access to case-base stored at different locations.. The outcomes demonstrated that the plan accomplished both the forward and in reverse security in E-Commerce applications.

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