An Auction Mechanism for Product Verification using Cloud

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Abstract: *The recent growth in the cloud computing resource had witnessed demands for the cloud server in the public and private sector companies. To meet these demands, the cloud resource is rented on the basis of auction mechanism due to its simplicity and versatility. In this paper, we are presenting the allocation of a commodity to the stakeholders using the bidding process in the cloud server. Under this auction, entity such as customer (buyer), owner (seller) participate, but to enhance the trustfulness of the bidding a novelty (Government) is added handling the entire auction process. The auction is performed using Optional Based Sequential auction (OBSA) algorithm in two stages (i-e) verification of commodity and price matching function. At the end, the verified commodity with highest price quoted is sold to the customer.*

Keywords—Cloud, OBSA, Two stage Auction

I. INTRODUCTION

The cloud computing is one of the modern technology which many people could utilize to access the data anywhere in the world. It relies on sharing of the resources in a coherent way in which any number of users could manage, share, store and process their data stored in it. The ideal types of service in cloud computing are their infrastructure that offer high level APIs, a computing platform including operating system, programming language executable environment, database ,web-server and software applications deployed in the cloud infrastructure which is accessed by user using thin interface(web-browser) making the wide procurement for cloud providers.

Because of these services in cloud computing, the extension of servers and network infrastructure among the information technology companies has widely increased. Cloud computing allows users to operate and get benefited even without a deep knowledge about the working of the cloud computing.

The concept of Virtualization separates the physical computer into different virtual devices where it is easy to manage and perform the computing task. When it comes under the resource used in the cloud, there are larger markets (cloud providers) bidding their cloud server in a open auction for Cloud Consumers. Due to this many stakeholders having heterogeneous demands are made to wait for several auction rounds. In the near future it is predicted that most of the MNC under IT and software field could move to cloud technology.

On this ideology, this paper is to present the bidding process of a particular product (Land) between different sellers and buyers through this medium. But, there is a possibility of forged documents and less authenticity between the seller and the buyer. Thus, to enhance the security and truthfulness of the property to be sold, A third party, the government in this case is added as a novelty to make this bidding process secured and trustworthy.

2. Literature Review

The Objective of this paper is to investigate the two correspondences through a two- mastermind auction framework. For the correspondences among customers and Product Owners, we get the OBSA technique to structure the resource task perspective.

1. **TITLE** : Combinatorial Reverse Auction based Scheduling in Multi-Rate Wireless Systems **AUTHOR:** Sourav Pal; Sumantra Kundu; Mainak Chatterjee; Sajal Das

YEAR : 2007

DESCRIPTION:

Opportunistic scheduling algorithms are effective in exploiting channel variations and maximizing system throughput in multirate wireless networks. However, most scheduling algorithms ignore the per-user quality-of- service (QoS) requirements and try to allocate resources (for example, the time slots) among multiple users. This leads to a phenomenon commonly referred to as the *exposure problem*, wherein the algorithms fail to satisfy the minimum slot requirements of the users due to substitutability and complementarity requirements of user slots. To eliminate this exposure problem, we propose a novel scheduling algorithm based on two-phase combinatorial reverse auction, with the primary objective of maximizing the number of satisfied users in the system. We also consider maximizing the system throughput as a secondary objective. In the proposed scheme, multiple users bid for the required number of time

slots and the allocations are done to satisfy the two objectives in a sequential manner. We provide an approximate solution to the proposed scheduling problem, which is NP-complete. The proposed algorithm has an approximation ratio of (1 + log *m*) with respect to the optimal solution, where m is the number of slots in a schedule cycle. Simulation results are provided to compare the proposed scheduling algorithm with other competitive schemes.

2. **TITLE :** Two Phase Scheduling Algorithm for Maximizing the Number of Satisfied Users in Multi-Rate Wireless Systems

AUTHOR: Sourav Pal; Preetam Ghosh; Amin R. Mazloom ; Sumantra R. Kundu ; Sajal K. Das

YEAR : 2007. **DESCRIPTION:**

Opportunistic scheduling algorithms are effective in exploiting channel variations and maximizing system throughput in multi-rate wireless networks. However, most scheduling algorithms ignore the per-user quality of service (QoS) requirements and try to allocate resources (i.e., the time slots) among multiple users. This leads to a phenomenon commonly referred to as the exposure problem wherein the algorithms fail to satisfy the minimum slot requirements of the users due to substitutability and complementarity requirement of user slots. To eliminate this exposure problem, we propose a novel scheduling algorithm based on two phase combinatorial reverse auction with the primary objective to maximize the number of satisfied users in the system. We also consider maximizing the system throughput as a secondary objective. In the proposed scheme, multiple users bid to acquire the required number of time slots, and the allocations are done to satisfy the two objectives in a sequential manner. We provide an approximate solution to the proposed scheduling problem which is a NP-complete problem. We prove that our proposed algorithm is (1 + log m) times the optimal solution, where m is the number of slots in a schedule cycle. We also present an extension to this algorithm which can support more satisfied users at the cost of additional complexity. Numerical results are provided to compare the proposed scheduling algorithms with other competitive schemes.

3. **TITLE** : ARMOR: A Secure Combinatorial Auction for Heterogeneous Spectrum

AUTHOR: Yanjiao Chen; Xin Tian; Qian Wang; Minghui Li; Minxin Du; Qi Li

YEAR : 2018

DESCRIPTION:

Dynamic spectrum allocation via auction is an effective solution to spectrum shortage. Combinatorial spectrum auction enables buyers to express diversified preferences towards different combinations of channels. Despite the effort to ensure truthfulness and maximize social welfare, spectrum auction also faces potential security risks. The leakage of sensitive information such as true valuation and location of bidders may incur severe economic damage. However, there is a lack of works that can provide sufficient protection against such security risks in combinatorial spectrum auction. In this paper, we propose ARMOR, to enable combinatorial auction for heterogeneous spectrum with privacy, which can preserve bidders' privacy while guaranteeing the economic-robustness of the combinatorial auction. We leverage the cryptographic methods, including homomorphic encryption, order-preserving encryption, and garbled circuits, to shield the bid and location information of buyers from the auctioneer. We design a novel location protection algorithm, which allows the auctioneer to exploit spectrum reuse opportunities without knowing the exact locations of buyers. Furthermore, we propose a verifiable payment scheme based on digital signature to prevent the auctioneer from forging the payment. The extensive experiments confirm that ARMOR maintains the good performance of the combinatorial spectrum auction, in terms of buyer satisfactory ratio and social welfare, and achieves privacy preservation with acceptable computation and communication costs.

3. Proposed system

The proposed algorithm (OBSA) uses another entity (government) to schedule the auction process and to enhance security and trustworthy towards the customer. Once all the product gets uploaded into the DB repository, the third entity (government) verifies individually for any changes in the details of document.

4. System Architecture

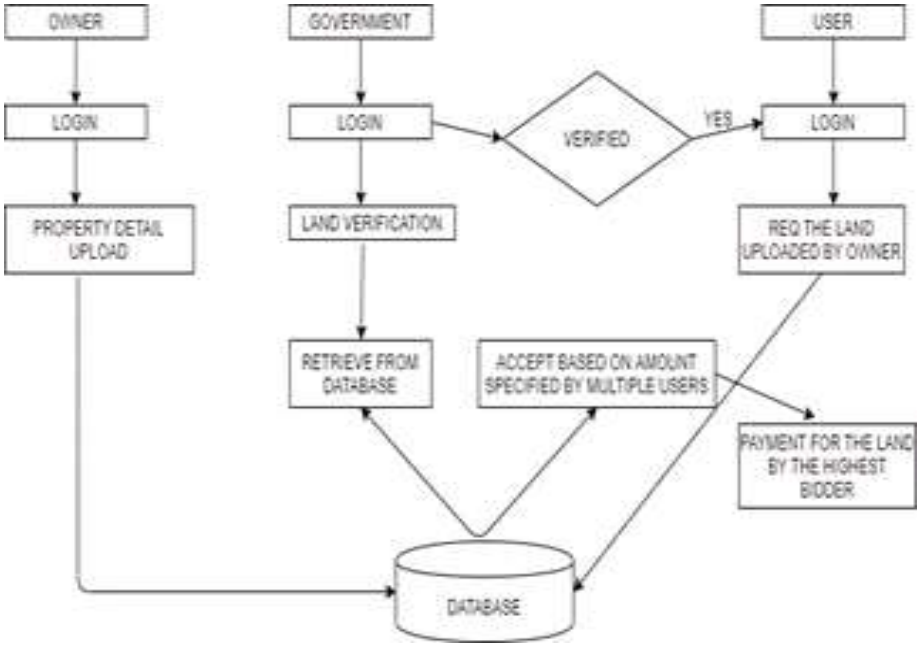
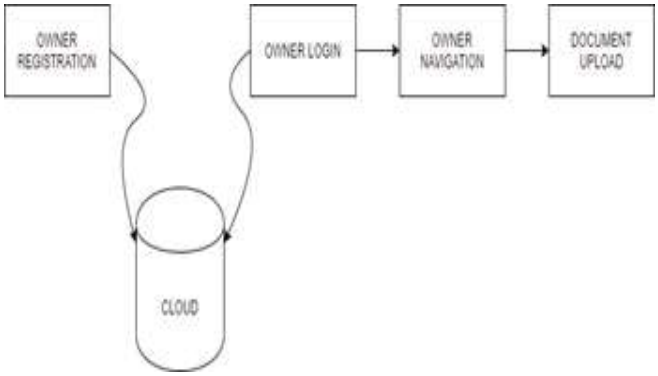


Fig: System Architecture

1. OWNER MODULE:

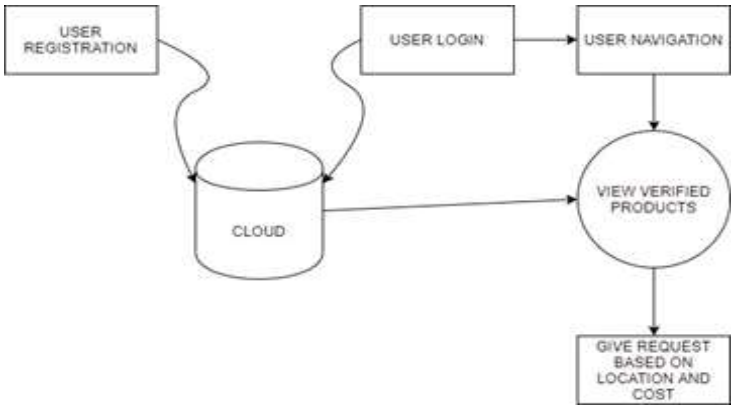


Owner will register his details and login to the page to view his navigation page, likewise several owners will enter their details here.

After logging in the owner will upload details about the product which he wants to sale, along with it he uploads product (Land) document and overall cost of the product.

Upon receiving the response, the user will be redirected to the payment page and the final amount inclusive of GST to be paid for the Government will be collected from the user. The GST amount will be taken by the Government as tax and the rest of the amount will be given to the product owner. After Payment, the user will receive the approved documents from the Government.

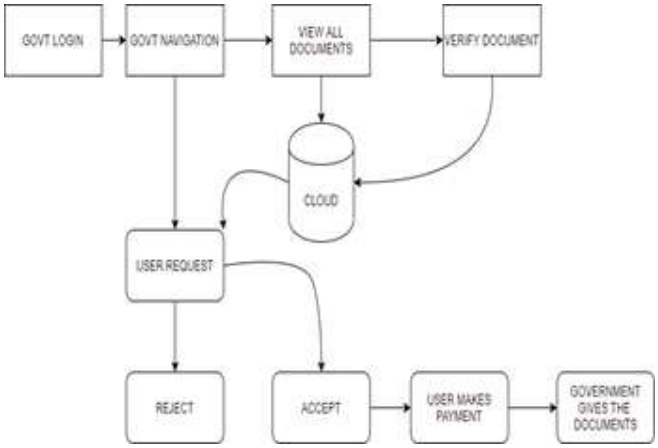
2. USER MODULE :



The User will then login using id and password or register if it's a new user. After logging in, the user can view products uploaded by owner and request for the product based on cost and location or area.

Upon receiving the response, the user will be redirected to the payment page and the final amount inclusive of GST to be paid for the Government will be collected from the user. The GST amount will be taken by the Government as tax and the rest of the amount will be given to the product owner. After Payment, the user will receive the approved documents from the Government.

3. GOVERNMENT MODULE :



The Government (Third Party) Logs in and view its navigation Page. Then the uploaded documents will be verified by the government. If the document is Valid it will be approved by the Government else the document will be rejected. Also they will check the value of the document matched by cost entered by user.

4. Workflow of System

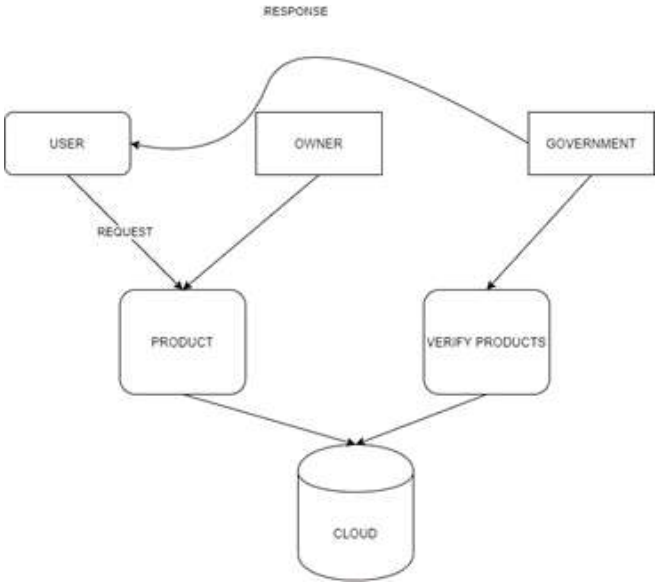


Fig: Workflow of System

1. Owner registration and product upload: The owner has to register his credentials and login with it. Once the user logs in he/she can upload a document of the land which has to be verified by the Government.

2. Government Verification: The Government verifies the uploaded documents, if the criterion are satisfied, the Lands is put up for Auction.

3. User Login and request: N Number of users can register, login and view the verified lands put up for auction and can quote a price based on location and base price.

4. Government Response: The Government sees the list of bidders and chooses the best one based on priority and highest bidding using OBSA algorithm and a response will be sent to that particular user.

5. User Payment: A Notification will be sent to the user who was selected by the government and the page will move to payment page. 6. Document Delivery: Once the payment is done, the documents will be delivered to the user by the government after deducting GST and sending the rest of the amount to the user.

5. Conclusion

In this paper, the auction for bidding the product is performed using the OBSA algorithm and price matching techniques. To improve the truthfulness of the product and trust between the seller and buyer, a third party (government) will be monitoring the entire process from approval the Land till the documents are delivered to the buyer. As an extension of this project on a large scale can connect a large market, cloud is used for storage, reliability and security purpose.

6. Acknowledgement

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