A Real-time E-Marketplace System
for Advertising Opportunities on Datacasting

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ABSTRACT

This paper describes the introduction of an e-marketplace system called "RealtimeMarket," on which broadcast airtime opportunities that are made available by datacasting can be handled in real-time. Features of this system are as follows: (1) real-time information sharing on the marketplace through the usual HTML browsers is enabled, even over the HTTP proxies or firewalls, by using bi-directional HTTP tunneling and data-replication technology, (2) a real-time trading model is adopted for the ad banner ads, (3) the Web site is designed to manage of ad opportunities in Japanese datacasting in an intuitive manner. As more and more items are handled by e-marketplaces, the demand for being real-time services will increase rapidly. The system described here will work as an important reference implementation for such cases.

Keywords

e-marketplace, real-time information sharing, ad opportunities

1. Introduction

Various types of e-marketplaces have been developed to trade automobile components, office facilities, etc. Different goods necessitate different trading styles, and new functions can create new marketplaces. Real-time trading is one of them. Let us think about the ad opportunities on broadcast TV [1]. For example, when a baseball game goes into extra innings and its program is being prolonged, the price of its ad space will be high, but the ad spaces that become available in this kind of scenario are not sold at a price that is considered reasonable price from the viewpoint of broadcast TV executers. Conventional systems do not fit a market that opens and closes the trading in such a short time.

We have developed an e-marketplace platform called "RealtimeMarket" and applied it to the trading of datacasting ad opportunities. In the following sections, we describe the mechanism of our real-time e-marketplace platform and its application to the ad opportunities trading field.

2. "RealtimeMarket" System

"RealtimeMarket" works as a platform for various domains of e-marketplaces. It consists of a basic-market system and a real-time information-sharing mechanism. The basic-market system consists of a general HTTP server and a market base. The real-time information sharing consists of a real-time information-sharing server and a document-replication server (**Figure. 1**).

The market-base system manages databases of items, dealings, and user information. It controls the dealings between buyers and sellers. These dealings are based on either on auctions or in a fixed-price catalog. The system has a data-replication function that can detect changes databases in real-time using external sub-systems, such as document-replication servers. The flexible extension and exchanging of data among other sub-systems can be achieved because the data formats are defined based on XML. The market base system is independent of data format. Therefore, the expression of data format can be revised without re-building the market-base system. The dealing processes are described in Java script language on Active Server Pages. The market-base system is also independent of dealing processes.

The real-time information sharing system can supply events immediately with market condition information through HTML browsers. We developed a bi-directional HTTP tunneling technology that enables advertisers to communicate with e-marketplaces through firewalls without laying on dedicated line. When an e-marketplace web page is downloaded, the real-time information-sharing servers are connected by an ActiveX Control client in the browser by using bi-directional HTTP tunneling protocol. When the database changes as the result of bidding or transactions, the document replication servers create HTML rewriting commands and send them to the real-time
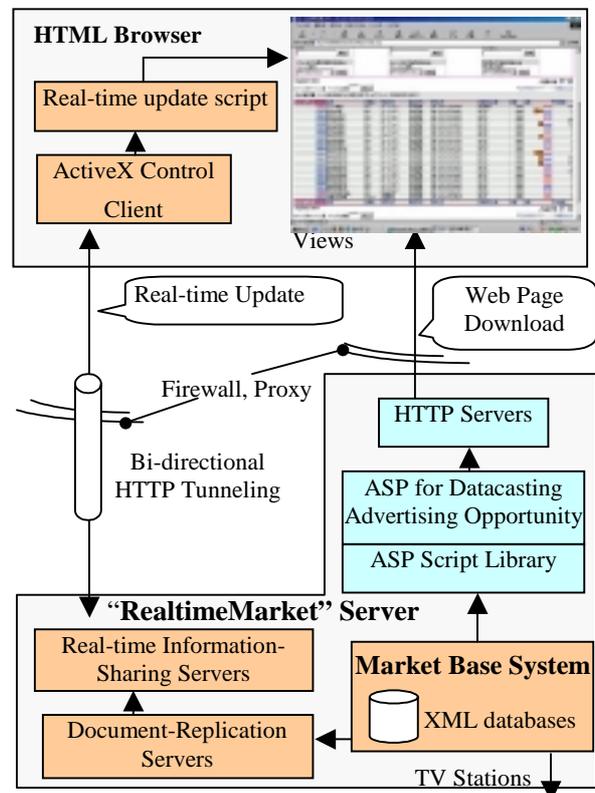
Figure. 1 "RealtimeMarket" Structure

information-sharing server. Then, the real-time information-sharing server pushes HTML rewriting commands to the ActiveX Control client. The ActiveX control client rewrites the HTML document. The mechanism of tunneling technology is as follows: First, the ActiveX control client makes a virtual-download channel and a virtual-upload channel to the real-time information-sharing server. The virtual-download channel passes large HTTP-GET transaction. The virtual-upload channel passes a large HTTP-POST transaction. The cells of commands are put into the HTTP-body data area and are transported to the ActiveX control client. This technology has the real-time information sharing-control mechanisms as follows: 1) connection maintenance protocols keep the virtual channels alive, 2) the real-time information-sharing server enables various bandwidth clients to communicate each other, and 3) heavy transactions are distributed to other servers. Therefore, an e-marketplace that has a real-time function can be constructed on the Internet through the use of extra networks of any bandwidth or quality.
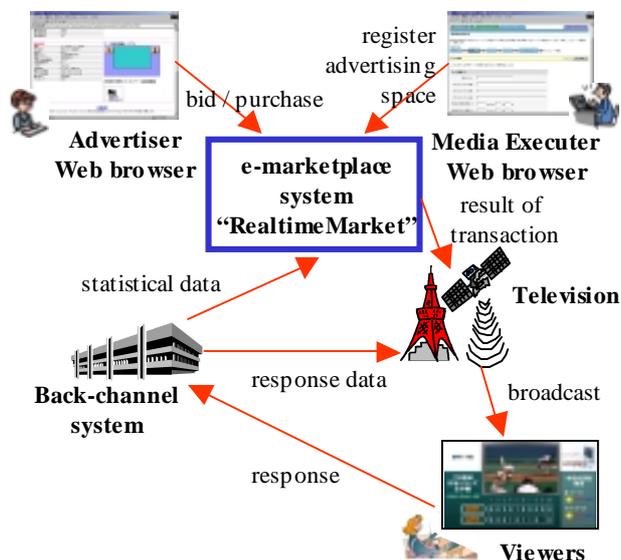
Figure. 2 E-Market Place of Ad Opportunity

3. E-Marketplace for Ad Opportunities on Datacasting

Digital data broadcasting service from a satellite (datacasting) started in December 2000 in Japan [2]. Datacasting gives more accurate real-time ad opportunities than those that are available on the Internet. By using "RealtimeMarket", media executers, such as TV stations, can sell their time-spots just before they broadcast. Furthermore, an advertiser can have their ad broadcast virtually at will if the need arises.

The system consists of the e-marketplace system "RealtimeMarket", Web browsers for advertises, Web browsers for TV stations, TV stations, viewers and a back-channel system (**Figure. 2**). Response data from viewers are sent to a TV station via the back-channel system. In addition, the response data are processed as statistical data and then sent to the e-marketplace. A TV station prepares the various parameters for an ad space, which includes the transaction type such as an auction or a fixed price. The TV station then registers them with the e-marketplace. An advertiser selects a preferable ad material from its list. Then they bid or commit to purchase the ad space. When a transaction between the TV station and the advertiser

occurs, the selected ad material is transported to the TV station immediately via the Internet. The TV station can now broadcast the ad to its viewers. It is important that an advertiser can select a preferred ad before the transaction with the TV station is made. With this feature, the time lag between the transaction and the airing of the ad can be reduced. An advertiser can also replace one ad with another.

4. Web Design of the Market

A web site in an e-marketplace for datacasting ad opportunities has two main parts: the media-side pages and the advertiser-side pages. The media's pages contain "Make Item", "List Views", "My Trade", and "Report View" for ad space opportunities. An advertiser's pages contain "List Views", "My Trade", "Banner Managing", "Auto Bid", and "Report View".

Advertisers can bid or purchase an ad opportunity on "Item Detail View" (**Figure. 3**). The web pages of "List Views" and "Item Detail View" are updated to show their current status, bid prices, and correct-time column in real-time without requiring the screen to be reloaded. Therefore advertisers can participate in auctions while they are viewing the current status of an auction. What they are viewing is always the latest information.

5. Conclusion

A real-time e-marketplace platform was developed and applied to the datacasting of ad opportunities and their trading. As e-marketplaces are applied to the trading of a wide range of items, the demand for real-time platforms will increase rapidly. We are planning to apply this system to a wide range of trading fields.

References

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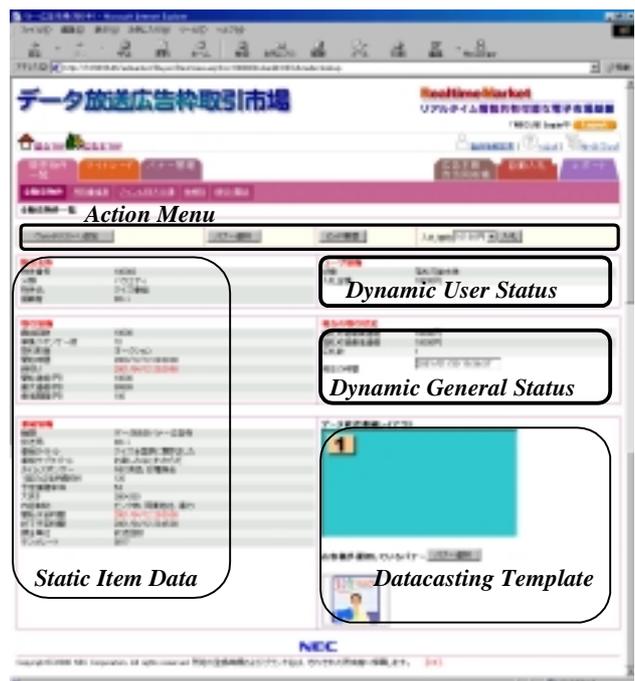
Figure. 3 Image of Item Detail