



159159

MARKET CLEARANCE METHOD AND APPARATUS

FIELD OF THE INVENTION

The present invention relates to a market clearance
5 system, of particular but by no means exclusive
application in e-commerce facilitation and in the
clearance of supply and demand of listed goods.

BACKGROUND OF THE INVENTION

10 A number of existing e-commerce facilitation and market
clearance systems are little more than on-line auction
systems.

The commerce system of US Patent No. 5,794,207 is a
15 "conditional purchase offer system" in which customers
specify their preferred price for a variety of goods and
services, and which is applicable to vendor to consumer
sales. This system allows a vendor to decide whether or
not to accept a customer's preferred price. The vendor
20 can deduce consumer demand from the number of requests
submitted by customers, and the preferred price in each
case. However, this system does not respond to
variations in supply, and does not provide customers with
an indication of real likely price, based on market
25 conditions (including supply conditions), or how the
ultimate price paid relates to these market conditions.

Accordingly, it is an object of the present invention to
provide a market clearance method that is responsive to
30 variations in both supply and demand.

SUMMARY OF THE INVENTION

A method of allocating the products of one or more
vendors to one or more customers, each of the products
35 having an asking price, the method including:
categorising the products by type into one or
more categories of comparable products;

9904736-7

21 SEP 1999



G00002

accepting one or more bids for one of the products; and

5 matching the lowest asking price of products of the category of products to which the one of the products belongs, with the highest bid for a product of that respective category if the highest bid is equal to or greater than the lowest asking price.

10 Thus, in any particular category the lowest priced product (which may be a good, a service, or any combination thereof) will be sold to the highest customer bid for products of that type. If only one bid is received, this bid is by definition the highest bid. The asking price in each case will be influenced by supply
15 and demand as perceived by the vendors, while the bids will principally reflect demand, though to a lesser extent supply depending on how well informed the market is. Further, according to this method the asking price functions as a minimum price, as the bid with which the
20 asking price is matched may be greater than the asking price.

It should also be noted that a category of products may be narrow, and in fact cover only one product. In this
25 case, a bid made for products of that category (whether specified by product or category) must exactly match the vendor's product for a sale to take place.

30 Preferably the method includes: determining respective representative prices for each of the categories of comparable products from the respective prices of each product in the respective category, and indicating the respective representative prices.

35 Thus, customers can decide what bids to place for a particular type of product on the basis of the representative price of that type of product.

The representative price for each category of products is preferably the mean, median, mode or moving average of the asking price of the products of that respective category.

The invention also provides an apparatus for allocating the products of one or more vendors to one or more customers, each of the products having an asking price and categorisable according to type, the apparatus including:

means for receiving and storing product information, including the asking price of the respective product and type of the respective product;

means for entering and storing one or more bids for the types of products; and

means for matching the lowest asking price of products of a specified category of products with the highest bid for a product of that respective category if the highest bid is equal to or greater than the lowest asking price, wherein the category of products includes those products of a comparable type.

Preferably the apparatus is operable to determine respective representative prices for each of the categories from the respective prices of each product of the respective category.

Preferably the apparatus is operable to display or communicate the respective representative prices.

The apparatus may be operable to accept, for each of the products, category information indicative of the appropriate category for the respective product. Alternatively, the apparatus may include means for determining the appropriate category for a respective product from the respective type of the respective

product.

The present invention also provides a system for allocating the products of one or more vendors to one or more customers, each of the products having an asking price, the system including:

a memory device for receiving and storing product information, including the asking price and product type; and

input means for inputting one or more bids for the types of products;

wherein the system is operable to match the lowest asking price of products of a specified category of products with the highest bid for a product of that respective category if the highest bid is equal to or greater than the lowest asking price, wherein the category of products includes those products of a comparable type.

Preferably the system includes a processor for categorising the products by type into one or more categories of comparable products.

Preferably the system is operable to determine respective representative prices for each of the categories of comparable products from the respective prices of each product in the respective category, and to display or communicate the respective representative prices.

The invention also provides a computer program product directly loadable into the internal memory of a computer, comprising software code portions for performing the method of the invention when the product is run on a computer.

BRIEF DESCRIPTION OF THE FIGURES

In order that the present invention maybe more clearly

ascertained, preferred embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

5 Figure 1 is a flow chart of a market clearing system according to a preferred embodiment of the present invention;

 Figure 2 is a schematic view of the system of figure 1 configured for use over the world wide web;

10 Figure 3 is a schematic view of the system of figure 1;

 Figure 4 is a schematic view of the supply confirmation subsystem of the system of figure 1;

 Figure 5 is a schematic view of the payment processing subsystem of the system of figure 1; and

15 Figure 6 is a schematic view of the supplier management subsystem of the system of figure 1.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

20 The operation of a world wide web market clearing system according to a preferred embodiment of the present invention is shown in flow chart form in figure 1. According to this system, a customer logs on and enters requested information in order to specify the desired product. Thus, the customer may specify the good or
25 service, the time and date of delivery, the dimensions of a goods (or colour etc) or any other characteristics. This information, collectively, specifies the product sought by the customer. The product information is then compared with a database of available products that
30 suppliers or vendors have previously indicate are available, in order to determine whether the desired product is indeed available. The product is deemed to be available either if the actual product is available, or if another product differing in unimportant respects
35 (i.e. the same category of product) is available. The breadth of the category (and hence the degree to which the desired product can differ from the available

products, yet still be deemed "available") can be preset by the system operator, or—in one embodiment—specified by the customer.

- 5 If the desired product is not available, an alternative product of similar characteristics will be offered to the customer, who may indicate "yes" or "no" as to whether this alternative product may be substituted for the desired product. If the customer indicates "yes", the
10 alternative product becomes the desired product and the system recommences.

- If the desired product is indeed found to be available, the system calculates and displays to the customer the
15 moving market median price of the category of products into which the desired product falls (by means of the "MMMP Calculator"). The customer then enters a bid, in the light of the moving market median price. If this is the only bid (and therefore the highest) for products in
20 this category, this bid is cleared against the lowest price product in the category. The order is then processed and payment settled, after which the customer log off.

- 25 If more than one bid is received simultaneously or in a fixed bidding time window, for products of the same category, the highest bid will be cleared against the lowest priced good in that category.

- 30 Thus, the system offers suppliers the opportunity to list their offerings on a "board" with other similar offerings. A measure of central tendency of market pricing for all the offerings on "board" (in the form of measures such as the mean, median or mode and moving
35 averages of the prices) is then estimated and presented to customers, who are asked to make a bid at or below the presented central tendency estimate. The offerings are

then sold on a "lowest price goes first" basis to the "highest customer bid".

5 The system allows vendors or suppliers to receive a market price which may be higher than the asking price, i.e. that at which they were initially willing to sell. In addition, the system, through the estimation of the measure of central tendency of market pricing gives useful price information about the competition and market conditions while maintaining total supplier price confidentiality. Suppliers' specific asking prices are shielded from both customers and from each other.

15 The system offers customers information about market conditions through the measures of central tendency of market pricing. Bidding at or below this central measure allows customers the possibility of securing a desired product at a price that may be less than $\frac{1}{2}$ the market (under the various definitions of measures of central tendency of market pricing) under all market conditions.

25 The system includes the concept of a listed good, i.e. one which can be categorized with other similar goods into a single list which is differentiated by and traded on the basis of price alone. The "board" groups the offerings of different suppliers into categories defined by the customer

MMMP Calculator (in the preferred embodiment, the moving market median price) for product category and updates it following every new transaction.

35 Thus, the system is driven by both the supply and demand of products, and gives an indication to customers of market conditions through the MMMP or other measure of central tendency of market pricing. Suppliers have already agreed to list and sell their products if a minimum asking price is bid. The supplier with the

lowest asking price is cleared against the current highest bid, if the current highest bid is equal to or higher than the supplier's asking price. Hence, suppliers may receive more than their minimum price.

5

Figure 2 shows the general setup of the system of figure 1. The system includes a central computer system 100, including one or more computers (optionally networked together), each having one or more central processing units (or CPUs), Random Access Memory (RAM), memory storage devices, a Network Interface Device connectable to (and in use connected to) the internet backbone, an operating system, world wide web server software, CGI (Common Gateways Interface) Modules and databases. In a preferred form, the system includes a Sun Starfire brand server with Superscalar SPARC or UltraSPARC IIx brand processor(s), the Solaris brand operating system, an Enterprise brand server, StorEdge brand 5x00 disk arrays for storage, which delivers 102,000 I/Os per second on nine terabytes of data, Enterprise NetBackup brand system (providing backup/restore), an Oracle8i brand database server,

10

15

20

25

Sun Security Manager brand Security system, and a network interface device for connection to the internet backbone

The system further includes a Web Client system 200, comprising a desktop personal computer (PC) connected to the Internet, provided with a web browser. The customer will generally use a credit card to make payments.

30

The system also includes one or more Supplier Systems 300. Each Supplier System 300 includes a computer, or a linked network of computers.

35

The system includes a Credit Clearinghouse system 400 for processing credit card payments.

The general operation of the system of figure 1 will be further described by reference to figure 3. A customer logs onto his or her personal PC and connects to the web server of the central system 100, which is
5 specific to the general area commerce (and therefore of products) desired by the customer. In the example of Figure 3, the illustrated web site is offering either excess capacity air tickets, or standard measure book shelving. If the customer selects, for example, the air
10 tickets channel 201, he or she will be asked to key in a range of desired product specification; in the case of the air-ticket site, the customer would specify destination, date and time of travel 202, or in the case of the book shelving site (not shown) shelving dimensions
15 and colours.

These customer preferred product specification are returned to webserver 101. A Product Matching Module 102A then extracts from a database of listed goods those
20 listed goods that match the customer's product specification and places them on a board 203A. For example, in the excess capacity air tickets site, the matching program 102A will place all available flights going between two destinations at the specified date and
25 time on the board 203A, e.g. all flights from San Francisco to Hong Kong on December 26th.

If there is no specific match, the program may generate nearest alternative specifications, which will be relayed
30 back to the customer 203B, who can either decide that he is not interested and exit the system, or that he will resubmit the suggested alternative as his new specification. If the latter, the new specification is resubmitted to the webserver 101 and the matching program
35 102A extracts a new set of listed goods from the database of listed goods which are placed on the board 203A. For example, in the book shelving site, the

specified dimensions of 1 ft × 4 ft × 2 in may not be available. The matching program 202 would then extract and offer as an alternative specification shelving of the nearest size, e.g. 1 ft × 4 ft × 1.5 in.

5

On the board 203A, the extracted set of listed goods are ranked according to price and a measure of central tendency of market pricing calculated by MMMP Calculator Module 102B is attached. In the illustrated embodiment, a moving market median price MMMP is used as the measure of central tendency. The customer is then asked to make a bid 203A, which will generally be at or below the indicated measure of central tendency of market pricing (in this instance the median price).

15

The customer's bid and product specification are confirmed and transmitted to the market clearing module 102C.

20

The market clearing module 102C is a program that compares the customer's bid to the offers listed on the board. If the customer's bid is higher than the lowest offer, then there is a potential sale. A message is transmitted to the customer that his or her offer is

25

being processed and that credit card details 204 should be provided. These details are then transmitted to a payments module 102E where information is checked and approved. Upon approval, a message is sent to the supplier communication module (see figure 4: Supply

30

Confirmation) confirming that the supplier offer has been accepted. The supplier will then re-confirm that supply exists and that he is able to deliver. Upon receipt of supplier re-confirmation, the customer is informed 205 about goods delivery details and the transaction is confirmed and settled in the payments system (see figure 5: Payment processing).

35

In this preferred system, listed goods fulfil the following criteria:

- they are supplied by more than one supplier;
- they are sufficiently similar at a basic or component
5 level for customers to be indifferent to suppliers and to be able to choose only on the basis of price; and
- a supplier must be willing to attach a price to the good.

10 Some examples of qualifying goods are: excess capacity air travel tickets, used cars, computing systems, home improvement lumber cuts, bulk foods and groceries.

The qualities of each listed good are enumerated (e.g.
15 year, model, colour for used cars) and each good is assigned a unique product identifier (UPID) and an offer (i.e. asking) price (OP). The UPID allows the goods to be classed with other similar goods. The OP is a point of differentiation.

20 In a more advanced embodiment of the system according to the invention, "listed goods" may be components of other goods which can be can packaged according to customer specifications into a sub-sample of qualifying packages
25 which are then listed on board. An example of such qualifying packages would be customized computer systems from different generic clone manufacturers. In this case, it is the components which are given UPIDs and OPs. The package will then have a composite identifier
30 formed of the component UPIDs and component OPs, the identifier being determined by the customer specification for the package.

The system also includes means for managing suppliers and
35 procuring "listed goods". Key features of this process are supplier sign on, supplier database management and supplier feedback. Figure 6 shows how the supplier

module 300 interacts with central system 100.

With reference to figure 6, the sign-on or recruiting process involves marketing the system to suppliers and obtaining binding agreements from suppliers to offer goods and/or components for listing in the suppliers database 102F at listed prices. These listed prices may include agreed discounts from these (standard) listed prices. Suppliers also agree to supply their goods and/or components if their listed prices are met.

The supplier database 102F may be populated: (i) manually, (ii) by direct electronic linkage to the supplier, or (iii) from publicly available lists.

In the supplier database population process of the preferred system, the supplier database will be linked to the supplier electronically so that supplier lists can be downloaded regularly. The lists will be in a pre-arranged format. According to the preferred system, there is a data classification and organization program which assigns a unique supplier ID to each supplier and a unique product ID to each type of good or component and an offer price. Each good/supplier is thus identified by a unique USID-UPID-OP identifier. Finally, a unique text description (TX) is attached to the UPID. The program then classes all similar UPID's together.

In another embodiment of the database population process, the supplier database is linked to a publicly operated facility (eg. a computerized airline ticket reservation system) which already lists the suppliers offerings. The data classification and organization program of the preferred system then adjusts the publicly listed goods according to pre-negotiated factors to obtain a sub-list of goods at pre-negotiated prices which the supplier agrees to list on the supplier database of the system.

For example, an airline may agree to list 20% of all the seats on the system of the present invention, though no more than 5 seats for any one flight. Moreover, it may agree that the listed price for these seats be 20%
5 lower than the usual retail fare.

Several other features will be available in the supplier communication module to keep the supplier apprised of market conditions, including:

- 10 • Reports of transactions done and comparisons of prices received versus prices offered (not shown);
- Inventory alert if inventory on supplier database is depleted 102G;
- 15 • Immediate market feedback upon receipt of qualifying customer bid, to include number of suppliers on the board at time of transaction and minimum price, median price, and maximum price at time of transaction (not shown); and
- 20 • Other market indicators which would assist suppliers in better understanding market conditions while maintaining confidentiality about individual supplier pricing (not shown).

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of allocating the products of one or more vendors to one or more customers, each of said products having an asking price, said method including:
 - categorising said products by type into one or more categories of comparable products;
 - accepting one or more bids for one of said products; and
 - matching the lowest asking price of products of the category of products to which said one of said products belongs, with the highest bid for a product of that respective category if said highest bid is equal to or greater than said lowest asking price.
2. A method as claimed in claimed 1, including:
 - determining respective representative prices for each of said categories of comparable products from said respective prices of each product in said respective category, and
 - indicating said respective representative prices.
3. A method as claimed in either claim 1 or 2, wherein said representative price for each category of products is the mean, median, mode or moving average of the asking price of the products of that respective category.
4. An apparatus for allocating the products of one or more vendors to one or more customers, each of said products having an asking price and categorisable according to type, said apparatus including:
 - means for receiving and storing product information, including said asking price of said respective product and type of said respective product;
 - means for entering and storing one or more bids for said types of products; and

means for matching the lowest asking price of products of a specified category of products with the highest bid for a product of that respective category if said highest bid is equal to or greater than said lowest asking price, wherein said category of products includes those products of a comparable type.

5. An apparatus as claimed in claim 4, wherein said apparatus is operable to determine respective representative prices for each of said categories from said respective prices of each product of said respective category.

6. An apparatus as claimed in either claim 4 or 5, wherein said apparatus is operable to display or communicate said respective representative prices.

7. An apparatus as claimed in any one of claims 4 to 6, wherein said apparatus is operable to accept, for each of said products, category information indicative of the appropriate category for said respective product.

8. An apparatus as claimed in any one of claims 4 to 6, wherein said apparatus includes means for determining the appropriate category for a respective product from said respective type of said respective product.

9. A system for allocating the products of one or more vendors to one or more customers, each of said products having an asking price, said system including:

a memory device for receiving and storing product information, including said asking price and product type; and

input means for inputting one or more bids for said types of products;

wherein said system is operable to match the lowest asking price of products of a specified category

of products with the highest bid for a product of that respective category if said highest bid is equal to or greater than said lowest asking price, wherein said category of products includes those products of a comparable type.

10. A system as claimed in claim 9, including a processor for categorising said products by type into one or more categories of comparable products.

11. A system as claimed in either claim 9 or 10, wherein said system is operable to determine respective representative prices for each of said categories of comparable products from said respective prices of each product in said respective category, and to display or communicate said respective representative prices.

12. A computer program product directly loadable into the internal memory of a computer, comprising software code portions for performing the steps of the method of any one of claims 1 to 3 when said product is run on a computer.

13. A computer program product stored on a computer readable medium, for causing a computer to perform the steps of the method of any one of claims 1 to 3.

14. A computer readable medium, having a program recorded thereon, where the program is to make computer execute a method as defined in any one of claims 1 to 3.