

An architectural approach to brokerage in network based commerce

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Abstract: This paper presents some examples of models of the relationships which underlie market activities. The purpose of enterprise models such as these is not only to define requirements on the technical systems and services to support electronic commerce, but also to support the re-evaluation of business models upon which such activities are based.

1 Introduction

Commerce on the Internet is viewed as a major business opportunity both for suppliers and consumers and also for the providers of the systems and service infrastructure that will support transactions. It is easy to assume, in our enthusiasm for new technological development, that the electronic commerce revolution consists of simply transferring familiar relationships and operations to a new electronic medium. The electronic medium, however, offers new flexibilities and constraints on the allocation of responsibilities and functions within market processes: it is not necessarily the case that retailing on the network will simply match the set of functions and responsibilities that have evolved in physical shops or that the new possibilities of distributed operation will not result in new forms of transaction.

The purpose of this paper is to present an approach to modelling and analysing commerce. We are using models such as these to explore the possibilities and consequences of new business models for electronic commerce and for the provision of services and infrastructures that could deliver and sustain it. In particular, we are looking at the set of relationships involved in brokerage, since, in such a large and unstructured market place as that potentially offered by the Internet, supporting customers' navigation of offers and management of commercial transactions require new approaches and possibly specialised assistance if they are to be effective. The mediation of market relationships is termed "brokerage" and the possible roles and relationships of brokers are the subject of this paper.

2 What is brokerage ?

To answer a question such as this, we must look behind the functions and roles we are used to observing and must identify the basic relationships and responsibilities that they implement. We start this process by identifying three phases of market interaction that are distinguished by the roles and objectives of the participants. The reason why these phases need to be so abstract is that, at this stage, we want to be able to represent all forms of commerce including the sale of goods, registrations for services and the distribution of information. These are activities which have, in the

past, been conducted in distinct markets each with its own specific characteristics. The phases of a market operation are:

Rendezvous where market information regarding suitable offers is sought and delivered. The rendezvous phase has two possible outcomes, a transition to transaction or a termination.

Transaction involves the establishment of a set of preconditions, the exchange of commitments and their subsequent discharge to achieve a defined set of post-conditions. As we shall see in the models, this phase may be distributed in both time and space and over a number of different participating enterprises or market actors. The responsibilities associated with transactions do not end with payment and delivery since one outcome of the transaction phase may be a complaint from one of the transacting parties.

Post-transaction involves the resolution of any complaint by a participant and the allocation of the responsibility for recourse.

Our first model identifies the basic roles involved in the three phases of a market interaction. We distinguish between the *consumers* and *suppliers*, who have a

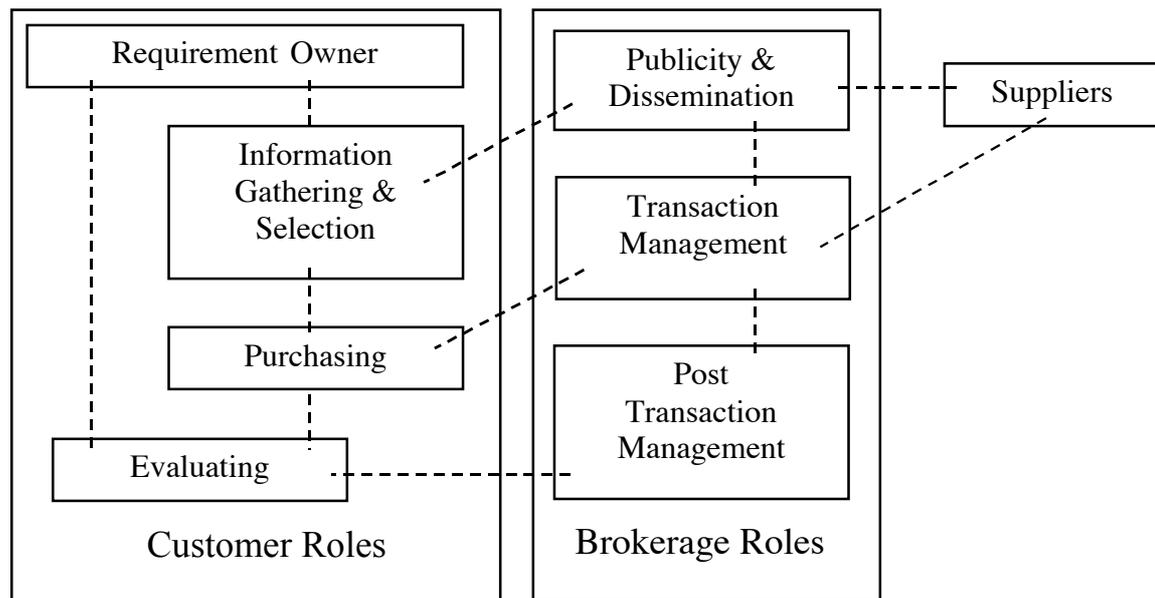


Figure 1: Broker – Customer relationships

direct interest in transacting, and *brokerage roles*, which support the underlying market process. The purpose of a broker is to facilitate the establishment and activation of a one to one relationship between a specific supplier and a customer, and to facilitate the transaction process between them. We identify and highlight these roles in our model because they are usually combined in the complex roles of market actors such as retailers who, for example, broker their own sales processes. By analysing the relationships at this lower level of detail, we are able to evaluate

whether it is possible to out-source certain roles and to offer them as common services, in this case, to suppliers who are stockholders.

In the rendezvous phase, it is the market publicity responsibilities of brokerage and the information gathering responsibilities of consumption that are activated. The former are concerned with such issues as advertising standards and trades descriptions while the latter is concerned with search and selection.

In the next phase of market activity, it is transaction management and

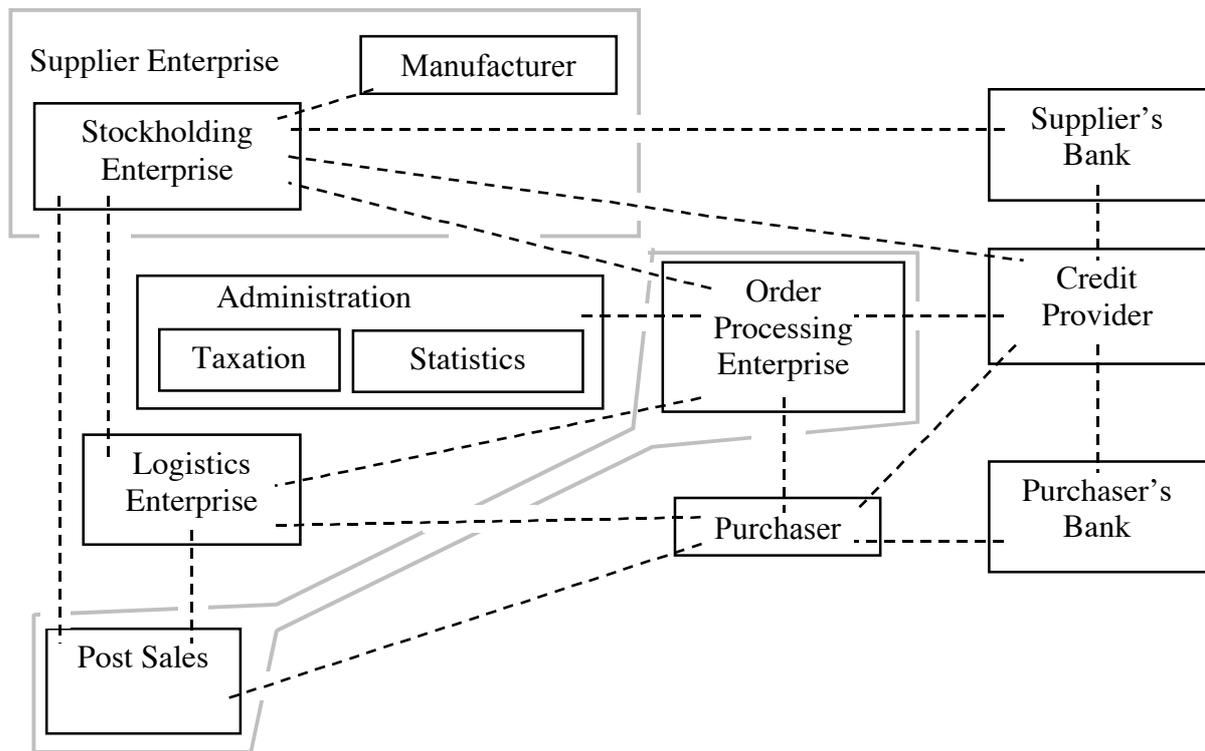


Figure 2: Transaction relationships

purchasing responsibilities which are activated, while in the post-transaction phase the enterprise which holds post sales responsibility may be required to respond to the evaluation role of the purchaser enterprise.

The level of trust required of a transaction manager is higher than that for advertising and market publicity because, as we see in Fig. 2, a number of other parties, including financial institutions, are involved as are resources with clearly defined monetary values. This distinction leads us to establish a separate business case, within broking, for cataloguing and advertising on the one hand, and transaction management on the other: they could be offered by different enterprises neither of which are the stock holder. However, the prospect of network-based commerce leads to the possibility of a smooth and direct transition for the user from the publicity phase to the transaction, delivery and payment. If this transition is to correspond to the passing of responsibilities from one enterprise to another, then appropriate

mechanisms must be deployed to create a persistent record of the interaction identified in Fig. 1 between the publicity agent and the transaction manager. This is required to support the possibility of commission payment to advertisers and also the resolution any post-transaction complaints on the grounds of misdescription of goods.

3 Decomposing transaction responsibilities

In the transaction model of Fig. 2, we consider the particular case of selling physical goods where supply involves manufacture and stockholding and delivery involves logistics. By grouping transaction and post sales responsibilities, the model indicates the policy that transaction management, which is undertaken by an order processing enterprise, may not be separated from post-sales responsibility. This represents the interests of the credit provider who may offer certain insurance benefits to the purchaser but who will not, for example, undertake to handle rejected goods. Such an approach is based on the responsibilities of a traditional retailer, defined as a combination of stockholder and transaction manager and is therefore not only a transaction manager but also a transaction participant.

While we can represent retailing by grouping market rights and responsibilities in our model, we can also explore other mappings of the boundaries of market actors. We have seen, for example, that order processing management may be separated from stockholding and offered as a service to suppliers. The ability to make this separation is particularly important in network-based commerce where the cost and the level of trust required to operate a transaction management service may represent a barrier to market participation particularly for smaller stockholding enterprises. It should be noted, however, that developments such as the Secure Electronic Trading protocol (SET), which strongly reflects the interests of the credit card and banking sectors, seem to assume that the enterprise which is responsible for managing the transaction is, in fact, a party to the transaction. The SET server is assumed to be equivalent to a point of sale terminal which is the merchant's property and responsibility. In reality, however, it could be a share of the resources on a computer which is owned, housed and managed by a third party, such as an Internet Service Provider, and protected by procedures and mechanisms which the merchant neither controls or understands.

A further consequence of the decomposition of responsibilities and value-adding in this model is that it reveals the possibility of separating the offers of stockholders from the logistics relationship, allowing delivery to operate as a potentially separate brokered market but maintaining an appropriate level of coherence and integration for the purchaser.

Finally, the level of trust required of the actors within the network and service environment in which transactions are conducted implies that this environment is regulated and appropriately policed. These requirements are not compatible with the open, highly accessible and dynamic space which is appropriate for advertising and publicity but correspond to quite different sets of responsibilities and relationships. The World Wide Web offers an interesting medium for market information exchange but might lose a substantial proportion of these characteristics if it were to be made a universally safe and appropriate medium for transactions. What is required is the means to move smoothly and efficiently from public web space to more regulated

transaction spaces and to have the corresponding contractual and commercial relationships to support the interworking between these spaces.

4 Some conclusions

The models presented in this paper may, at first sight, seem rather abstract and somewhat remote from the realities of commerce and systems development. If we believe that the migration of significant sections of commerce from high streets and from paper based catalogues to the network will be a simple process, re-implementing well understood business structures and protocols, then, no doubt, there is little purpose in attempting so fundamental a re-examination of market relationships.

If, however, the introduction of network based commerce creates the opportunities for new configurations of systems, services and processes and new business models, then we need to be able to identify and evaluate these opportunities, and the threats associated with them, before embarking on the investment required to develop and deliver electronic commerce. While this consideration justifies the effort required to re-establish more fundamental and rigorous models of commerce and service provision, the requirements for a sound and comprehensive basis for regulation and standardisation provide an even stronger argument for such an approach. If the quality of the analysis and justifications which underpin standards and rules for the introduction of network based commerce are inadequate, then, at the very least, we may fail to recognise major opportunities, at worst, we may create unstable, closed and inefficient platforms for commerce with economic and social consequences which cannot be foreseen.

5 Acknowledgements

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A more complete analysis and description of brokerage relationships and the implications they have on the systems and services which support them is located in the COBRA deliverables to be found at our anonymous ftp site:
<ftp-cobra.octacon.co.uk> where the documents are in WORD 97 format.