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# The Role of Information Technology in Ex-ante Transaction Processes

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## Abstract

*The electronic market hypothesis (EMH) has found little support in research practice. Alternative hypotheses have been formulated and tested with more satisfactory results. However, today's Internet successes (e.g. Amazon bookshop) seem to support the original EMH. This implies that the EMH may be correct in forecasting electronic markets, but wrong in determining the conditions under which these markets would arise. This article re-investigates the EMH conditions, and proposes a framework, based on marketing and transaction cost theory. The framework is used to score and compare some 50 electronic market sites on the Internet (books, cds and mortgages).*

## Introduction

In the electronic market hypothesis (EMH), Malone et al. (1987) assumes that the introduction of information technology (IT) will decrease transaction costs (costs of coordination), and, hence, will favor the evolution of market governance structures that have always been hampered by high coordination costs (Malone et al., 1987). The EMH recognizes two conditions, partly derived from transaction cost economics: asset specificity and complexity of the product description. When scores on both conditions are low, then electronic markets are expected to evolve.

Since the publication of the EMH, a number of authors (e.g. Clemons & Row, 1993; Bakos & Brynjolfsson, 1993) have argued that the proposed relation between IT and electronic markets is not that straight forward. They found that organizations intensify their cooperation in small, but tightly coupled groups, being neither markets nor hierarchies. Clemons et al. (1993) have called this hypothesis the "Move to the Middle" Hypothesis (MMH). This new hypothesis received strong support in *business-to-business* markets. Research has shown that a move to the middle is indeed taking place in EDI-facilitated supply chain and outsourcing relationships (e.g. Clemons & Row, 1993; Womack et al., 1990).

Also in *business-to-consumer* markets the EMH has not received strong support to date. Hess & Kemerer (1994), for instance, have investigated the life cycles of 5 electronic mortgage systems (computerized loan origination or CLO), that were introduced in the US in the nineteen eighties. They found only little support for the EMH in the home mortgage market and concluded that the underlying hypothesis will require augmentation, in particular the condition *complexity of the product description*, in order to fully explain the results in this market.

However, in other economic sectors, electronic consumer markets do evolve (books, cds, travel). In EMH terms, Amazon Bookshop provides *personalized decision aids to help individual buyers select from the alternatives available* (Malone et al., 1987), which makes it an electronic market. This supports Hess & Kemerer's conclusion that the problem with the EMH is not so much the prediction of electronic markets in itself, but rather the formulation of the conditions under which electronic markets would arise.

## Framework of Ex-ante Activity

Review of the CLO-research by Hess & Kemerer (1994) makes clear that the failures of electronic mortgage markets are still not properly understood, and that this may be due to a poor understanding of IT's role in the stage prior to purchase. Ives and Learmonth (1984) have called this the *requirements* stage of the Customer Service Life cycle. Champy (1996), who has compared a number of early commercial Internet sites, elaborates on this stage and introduces the term *the customer process*, comprising:

1. knowledge
2. interaction
3. networking
4. sensory experience
5. ubiquity
6. aggregation
7. customization

According to Champy, customers will, depending on the product and individual preferences, want to go through at least a number of these steps, before entering into any agreement. And in doing so, customers will be susceptible to help and assistance provided by suppliers or brokers. In other words: it is not so much the complexity (EMH condition) of cars that blocks the evolution of electronic car markets, but rather the customer's wish to take the product for a test drive (sensory experience).

In transaction cost economics, Ives and Learmonth's *requirements stage* and Champy's *customer process* are only one side of the Ex-Ante stage of the transaction (Williamson, 1975, 1985). In this stage, both customers and suppliers are looking for business opportunities. The costs of searching, communicating and settling agreements are called transaction costs Ex-Ante. Since transactions involve suppliers and customers, a supplier process should be distinguished alongside Champy's customer process.

The *supplier process* can be derived from general marketing literature (such as Lovelock, 1991) and, more specifically, from students of market driven organizations' capabilities (Day, 1994; Webster, 1992). Suppliers spend energy and money to find prospective customers in their *moment of truth* (Berry, 1980), they want to know more about them, to interact, to help them browsing the offer, to advise them, to give quotes, and, eventually, to come to an agreement. Suppliers will develop electronic commerce sites which optimize the supplier process, and they will only consider the use of an electronic market if the broker's site handles the supplier process in a more effective way. Again: it is not so much the complexity of cars that blocks the evolution of electronic car markets, but rather the inability to pass through the entire supplier process.

### Research Question

Re-interpretation of the CLO systems research (Hess & Kemerer, 1994) shows that these systems hardly supported the customer process, and that the supplier process was supported only slightly better:

- the systems generally did not support the customers' Ex-Ante processes, except for limited *knowledge* and *interaction*.
- the systems, placed in realtors' offices, allowed the lenders to meet prospective borrowers in an early stage of their home buying process (*knowledge* and *interaction*), and all systems supported *advice* (loan selection); *quotes* and *agreements* were not equally supported by all systems.

The researchers did not take Ex-Ante processes into account, and expected that:

*"customers, in this case borrowers, will be driven by their desire for lower interest and closing costs to favor electronic markets over electronic hierarchies as forms of industry organization."* (p. 256).

Compared to the CLO systems, the Ex-Ante support provided by Amazon bookshop is much more advanced, since it offers support to *both* the suppliers' *and* the customers' Ex-Ante processes. Not only does it allow a large number of publishers to find prospective customers (from *knowledge* to *agreement*) in their moment of truth, something they could not achieve before, but it also supports a number of Champy's steps: *knowledge*, *interaction*, *networking* (readers' comments) and, to a limited extent, *sensory experience* (e.g. read the content, see the cover) and *ubiquity* (e.g. chose shipping mode).

Modern home lenders on the Internet, like the American Finance and Investment, Inc. owned Loanshop, offer information and calculators, and enable customers to talk to a mortgage counselor, who is "just a click or a call away" (Loanshop's homepage). These sites perform better in the Ex-Ante stage than the 5 CLOs in Hess & Kemerer's research.

This leads to the hypothesis that utilization of information technology causes a *move to the market*, only under the condition that it is utilized in such a way as to support Ex-Ante activity in both the customer and supplier processes.

### Research Approach

According to the framework above, two check lists have been developed, with which the Ex-Ante performance of electronic commerce sites can be scored. One check list scores the site from a supplier's perspective, and the other one does so from a customer's perspective. All steps of both Ex-Ante processes have been operationalized in a number of items in the check list. The "customer's" check list is presented below (for illustrative purposes only).

Validity and reliability of both check lists are now being tested. A number of researchers are independently scoring the same sites. The scores will be compared, and this may lead to modifications. Meanwhile, the lists are also being judged by consumers and marketers, who have been asked to indicate the relative importance of each item. This will lead to a weighting factor per item.

Next, some 50 leading, well-visited electronic commerce sites will be selected, on the basis of various publications available on the Internet. In EMH terms, the sites represent both electronic markets (e.g. Amazon Bookshop) and electronic hierarchies (e.g. Barnes & Noble). The sites cover three different markets (books, cds and mortgages) in three different countries (USA, UK, Netherlands).

Each site will be scored by 3 researchers independently. The scores will then be compared and the results will be matched with the commercial success of those sites (numbers of hits, unique hits, and customers, and the business volume generated through the sites). These commercial details will be obtained from several sources and from the suppliers themselves.

Also, the 5 CLO systems (Hess & Kemerer, 1994) will be scored, and these scores will be compared to those of their modern Internet based counterparts in this research.

### Results

The first results are expected to be available in June 1998 and preliminary findings will be presented at the Baltimore conference in August 1998. The results may shed new light on the role of IT in Ex-Ante processes and, hence, in the evolution of electronic markets.

Customer Process Check List for E-Commerce Sites			
Site name:			
Observer(s):			
Date and time:			
	Question	Answers	Score
<b>1</b>	<b>Knowledge</b>		
1.1	Does the site provide information about the supplier's organization?	"About-us" information Annual report Press releases	
1.2	Does the site contain information about the supplier's attitude towards customer privacy?	No Yes	
1.3	Does the site present pictures of the supplier's products (goods and/or services)?	No Yes	
1.4	Does the site present descriptions of the supplier's products?	No Short descriptions Detailed descriptions	
1.5	Does the site provide information (pictures and/or descriptions) of the product variations?	No Some examples Detailed descriptions	
1.6	Does the site provide actual information about prices and conditions?	No prices nor conditions Rough indications Detailed and accurate information	
1.7	Does the site use customer data, coming from former transactions, to give personal advice?	No Yes	
<b>2</b>	<b>Interaction</b>		
2.1	Does the site enable the customer to send e-mail to the supplier?	No Yes	
2.2	Does the site use electronic forms for the customer to fill in?	No Yes	
2.3	Does the site offer computerized help to enable customers to find their way through the offer?	No Buttons to product categories Search engine Interactive help	
2.4	Does the site show the supplier's phone numbers?	No phone numbers General number Call me back option Specialists' direct numbers	
<b>3</b>	<b>Networking</b>		
3.1	Does the site show references (cases or projects) through which the customer can assess the supplier's earlier performance?	No Some references References without external links References with external links	
3.2	Does the site show customers' comments on the supplier's goods or services?	No Some references References without external links References with external links	
3.3	Does the site give access to an independent customers' community?	No Yes	

	Question	Answers	Score
<b>4</b>	<b>Sensory Experience</b>		
4.1	Does the site enable the customer to see or hear a demo of the products?	No reference to demos Refers to other location Provides a demo No manipulations	
4.2	Does the site enable the customer to manipulate the products on-screen?	Refers to other location Enables manipulation	
4.3	Does the site refer to test information or enable the customer to test the products?	No reference to test Provides test information Refers to (other) test location Enables a test	
<b>5</b>	<b>Ubiquity</b>		
5.1	Can the customer determine <i>that</i> ay on which the product has to be delivered?	No Roughly (within a week) Accurately	
5.2	Can the customer determine <i>thdocation</i> at which the product has to be delivered?	No, there's only one place Choice, but not anywhere Anywhere	
<b>6</b>	<b>Aggregation</b>		
6.1	Does the site provide information, which is not related to the product itself, but relevant for the customer's context?	No Little information Much information	
6.2	Does the site provide links to other suppliers who offer additional products relevant for the customer's context?	No links Few links Many links	
<b>7</b>	<b>Customization</b>		
7.1	To what extent are the products being customized?	Only standard Choice between variants Products can be configured	
7.2	Does the site provide information about the consequences (e.g. price, delivery time) of the customer's choices?	No Yes, only indications Yes, accurate information	
<b>8</b>	<b>Quote</b>		
8.1	Does the site provide official quotes (including price and conditions)?	No Yes	
8.2	Does the site enable the customer to <i>pre</i> -qualify for a certain product?	No Yes	
8.3	Does the site enable the customer to lock-in an option?	No Yes	
<b>9</b>	<b>Agreement</b>		
9.1	Does the site provide overview of the complete transaction before the customer agrees?	No Yes	
9.2	Does the site provide a separate confirmation of the transaction?	No Yes, later (mail or email) Yes, immediately	
9.3	Does the site support payment systems?	No One payment system More than one payment systems	

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