

Dear Readers,

Electronic commerce is booming more than ever. Businesses are eagerly establishing Web-pages, and online services such as Compuserve, America Online or Microsoft Network are reporting ever increasing memberships. Electronic Commerce has clearly become a 'must' for companies. When we started EM-Electronic Markets four years ago, many of these trends were only a pie in the sky. Meanwhile, the number of subscribers to our newsletter has been growing steadily with a marked increase in the last two years. In view of this development and also the very positive feedback we have been receiving from many of our readers, we decided to professionalise our newsletter and to expand it into a full-scale journal. Next year EM-Electronic Markets will appear in a new shape. We are currently in the planning phase and would welcome your ideas on what we should improve. Enclosed you will find a questionnaire that will take you at most two minutes to complete. Please use this opportunity to help create an EM-Journal that optimally matches with your interests.

Last but not least, there have been some changes concerning the editors themselves. Rainer is currently a visiting researcher at the University of California in Irvine. Stefan is now with Telekurs in Zurich, where he is in charge of the realization of a new interbank payment system and its integration into electronic markets.

In closing, we would reiterate our plea for your cooperation in filling in the questionnaire and assure you that we will reciprocate by keeping you posted on the latest thoughts and ideas in our fascinating field.

Sincerely


Rainer Alt


Stefan Zbornik

Editors

Electronic Commerce and Reduced Transaction Costs

Firms' Migration into Highly Interconnected Electronic Markets

Electronic commerce is a rapidly growing area enjoying considerable attention with the emergence of the Information Superhighway or the National Information Infrastructure (NII). Numerous firms are beginning to position themselves on this superhighway in terms of providing hardware, software, information content or services.

Most industry observers stipulate that it will take about five to ten years until the NII will be fully in place. When this state is achieved, considerable changes in the

** by Prof. Dr. Rolf T. Wigand
Syracuse University*

economics of marketing channels, patterns of physical distribution and the structure of distributors are likely to occur (e.g., [7]).

The ideas presented here are based on five key assumptions once the NII has emerged and a critical mass can be identified:

1. Everyone and every organization will be connected.
2. The connections will be at a very high band width rate, greater than a billion bits per second and sufficient to carry out interactive multi-media transactions.
3. Cheap, high-speed computation will be available on the NII to facilitate the implementation of low-cost coordination transactions.
4. A market choice box will serve as the interface between the consumer and the NII and will provide interactive capabilities necessary to exercise free market choice in an easy and intuitive way.
5. There will be no market access favoritism in the design of the NII.

This research is based on previous studies focusing on transaction cost theory and electronic markets, suggesting that due to efficiencies gained:

- Intermediaries between the manufacturer and the consumer may be threatened as the NII reaches out to the consumer.

- Profit margins may be substantially reduced.
- The consumer is likely to gain access to a broad selection of lower-priced goods.
- There will be many opportunities to restrict consumers' access to the potentially vast amount of commerce.

An essential component to the evolution of this future world of electronic commerce is the *market choice box*. This is understood as the consumer's interface between the many electronic devices in the home such as television, cable, telephone and computer, and the information superhighway.

Transaction Cost Theory

Transaction cost theory helps us to understand how markets and hierarchies are chosen. In free market economies one can observe two basic mechanisms for coordinating the flow of materials and services through adjacent steps in the value chain: markets and hierarchies [10, 16]. Williamson [19] classifies transactions into those that support coordination between multiple buyers and sellers, i. e. market transactions, and those supporting coordination within the firm, as well as industry value chain, i. e. hierarchy transactions.

The price a product is sold for consists of three elements: production costs, coordination costs and profit margin. Throughout the relevant literature, scholars often choose different terms to describe coordination costs; Chandler, e. g., labels them as administrative costs [4]. Malone et al. [10], e.g., distinguish among productions and coordination costs. A recent Office of Technology Assessment study [14] provides a de-

tailed example of a consumer purchase (the purchase of a high-end stereo system) from a transaction cost perspective.

Economic theory and actual market behavior assert that firms will choose transactions that economize on coordination costs. As information technology continues its rapid cost performance improvement, firms will continue to find incentives to coordinate their activities electronically. Often, this coordination takes the form of single-source electronic sales channels (one supplier and many purchasers coordinated through hierarchical transactions) or electronic markets. It follows too that electronic markets are more efficient forms of coordination for certain classes of products transactions. Utilizing cheap coordinative transactions, interconnected networks and easily accessible databases, economic theory predicts that a proportional shift of economic activity from single-source sales channels to electronic markets is likely to occur, as:

1. Lower coordination costs favor electronic markets.
2. Low-cost computation favors electronic markets by simplifying complex product descriptions and reducing asset specificity.

3. An evolution from manufacturer-controlled value chains to electronic markets can be anticipated.

4. Stakeholders will opt for markets when increased volume is greater than loss in revenue from electronic market effect.

The above four explanations can already be observed in a number of applied settings. Competing computerized reservation systems (e. g., American Airlines' SABRE CRS), certain firms within financial markets, commodity markets and in time electronic markets will evolve from electronic single-source sales channels to biased markets where the market maker is one of the providers and uses the market transaction mechanisms in its favor to unbiased markets and finally to personalized markets where customers can use customized aids in making their choices.

Emergence of Electronic Single-Source Sales Channels

The emergence of electronic single-source sales channels can presently be observed within industry and is well described in the popular business press and trade journals. Little, however, is being

reported with regard to the larger picture of the developments, i.e. the overall expansion of electronic markets. The following explanations are advanced:

1. *Impact of interorganizational value chains:* Firms readily envision opportunities in electronic interorganizational value chains for improving their respective competitiveness. Thus they choose hierarchical arrangements rather than lower cost market transactions with less control of the factors noted above. In an effort to integrate supply chains electronically, buyer-supplier links such as electronic data integration transactions produce inventory and coordination savings for large purchasers and the suppliers, in turn, are forced to accommodate. Well-known examples depicting this development can be found with Wal-Mart's supply chain, as well as in the relationship with auto manufacturers and their suppliers. Single-source sales channels for travel agencies such as Rosenbluth Travel have expanded their business through agency partnerships in countries where they share a common process and database for tracking customers around the world. In this fashion, Rosenbluth can provide them with lowest prices and emergency services. [12]. This travel agency then is an example of the last evolutionary stage predicted for electronic single-source sales channels, a shared data base between partners.

2. *Fear of profit margin deterioration:* Firms can be expected to be very cautious about giving up their single-source sales channel profit margins, at least until a virtual market has clearly been created with enough participants to force their entry. This is especially the case when an oligopoly of relatively large firms controls a market in which each would risk sizable market share and profit margin in an electronic market. In the case of electronic markets for travel reservation systems, there is evidence that the profits of former sales channels (the airlines) are drastically reduced, while the profits of the market maker (e. g., SABRE, APOLLO) remain high.

Bakos has analyzed why the electronic market effect drives profit margin from the supplier [1]. In price competitive markets, even a small cost of search on the buyer's part may enable sellers to maintain prices substantially above their marginal costs: in this scenario, the introduction of a market system providing price information can dramatically reduce seller profits and increase buyer welfare. According to Bakos [1], this effect, which is supported in economic theory, can be anticipated in undifferentiated markets such as commodity markets and he cites the examples of Reuters, Quotron and Telerate, all with established markets in U. S. government fixed-income securi-

Contents

Editors' Note	1
Research Issues	1
Electronic Commerce and Reduced Transaction Costs Prof. Dr. Rolf T. Wigand, Syracuse University, USA:	1
Intelligent Organizations: Building Core Competencies Through Information Systems Prof. Dr. Markus Schwaninger and Michael Flaschka, Univ. of St.Gallen, Switzerland:	6
Making EDI Add Value to Small and Medium Sized Manufacturing Dr. Jonathan A. Morell, William Neal and Viki Fries, ITI Ann Arbor, USA:	9
Inhibitors to Adoption of Electronic Commerce Peter Murchland, South Australian Government:	11
Paperless Letters of Credit and EDI on the Internet Matthew W. Galland, University of San Francisco, USA:	13
Project Descriptions	15
Practical Solution for Implementing a Certification Path Jaroslaw Tymowski, Krajowa Izba Rozliczeniowa S.A., Poland:	15
The Chambers of Commerce as Trusted Third Parties in Electronic Markets Dr. Otto Müller, Zurich Chamber of Commerce, Switzerland:	16
EDI und UN/EDIFACT: Noch ist Zeit zum Agieren Patrick Maeder, EDIFACT AG, Switzerland:	17
Competence Center for Process and Systems Integration Dr. Petra Vogler and Manuel Zollkofer, University of St.Gallen, Switzerland	18
Competence Centre Electronic Markets	19
Conferences on Electronic Commerce / Calendar of Events	23
Impressum / Preview / Order Form	24

ties, leading to a reduction in trader profits from large bond dealers.

Additional evidence is needed to clearly demonstrate the *market maker effect*, i. e. the phenomenon in which the consumer does very well, yet producers lose their profit margin and the market makers gain the remaining profits. This scenario suggests that producers may find it hard to generate sustainable profits without finding new strategies for product and service differentiation. Even though such losses are widely recognized, electronic markets continue to proliferate and expand such as in financial markets, commodities and, as already noted, in the travel industry. Electronic markets have also encroached upon traditional niche markets where there are no large single-sources sales channel suppliers with a high market share to protect, such as airplane spare parts.

no-load purchases can buy from several smaller markets as well. Consequently, the market-maker effect may threaten the mutual fund industry's profits in the same way it did in airline reservation systems. It may require, however, competitive market makers in no-load funds to prevent market deterioration in no-load funds. Only time will tell how strong the market-maker effect will be in the mutual fund industry. A few examples, actually they may be viewed as precursors of things to come, will illuminate this future setting. Rapid growth in catalog and cable shopping networks suggests that (1) there are many products meeting the criteria for electronic markets, i.e. low asset specificity and ease of description, and (2) consumers are willing to buy these products without going to a retail store. QVC, the highly successful cable television shopping channel, has been

technology opens its doors, electronic sales channels and, in turn, electronic markets will be unable to make significant inroads with the consumer. It follows that homes must be wired for interactive, high-quality videos so consumers have a friendly, flexible way to access markets. These required technologies are evolving rapidly and the NII is one organizer of these technologies. Current traditional retailing markets are not likely to change significantly until the NII connects consumers to the evolving industry value chain.

Industry Value Chains

It is important to explore how purchasing and selling transaction patterns are likely to change once the NII is implemented and how selling prices will be affected. Figure 1 depicts three variants of traditional value-added chains and the resulting growth in value added and selling price. It should be noted that the author considers here only industry value chains terminating with the consumer, as opposed to intermediate goods value chains.

The example used here, i. e. the purchase of a high-quality shirt, is based on actual data [18] not even involving electronic sales channels. It is highly likely that actual costs savings to the consumer may even be higher than depicted here. The first chain in Figure 1 depicts the traditional chain of market hierarchies, i.e. producer, wholesaler, retailer and consumer. An alternative chain, the second chain, bypasses the wholesaler, resulting in a lower purchase price for the consumer. When appropriate information technology can reach the consumer directly, as shown in the third chain, the manufacturer can utilize the NII and leap over all intermediaries.

In reality, the manufacturer is likely to retain as high a portion of the savings enjoyed by the consumer, unless, of course, market forces make this impossible. An additional scenario is conceivable and highly likely to emerge: With the NII unfolded, the consumer could easily access a sufficient number of single-source sales channels through a market choice box or an interactive agent to search shirt manufacturers for a suitable shirt. In this setting, the market-maker effect may give the consumer a minimum price, but the market maker would not have a significant transaction profit [1]. In yet another scenario, the consumer could access a set of single-source sales channels through a market choice box or an interactive agent to search shirt manufacturers for the desired shirt. In this setting, the market-maker effect may give the consumer the lowest price, in turn, though, the market-maker would not have a significant transaction profit [8].

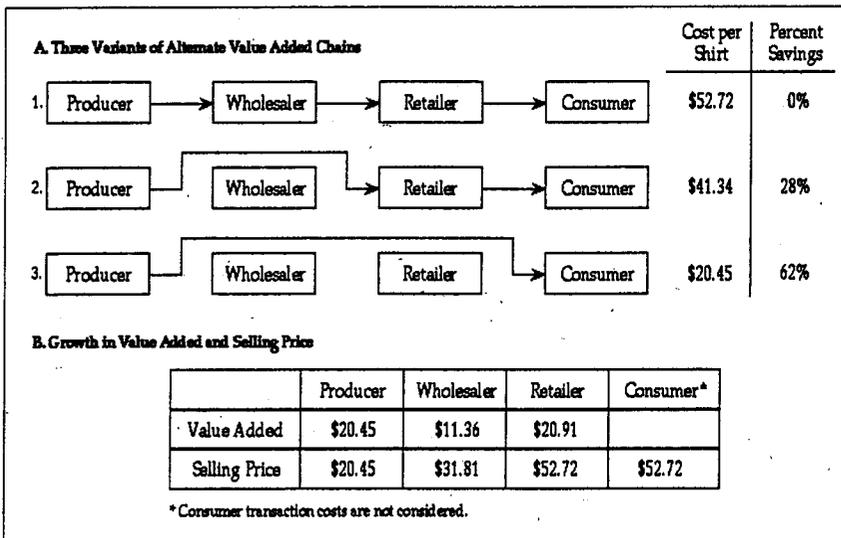


Figure 1: Value-added chains in the shirt industry

OneSource

Schwab's OneSource mutual fund market shows additional support of the market maker effect. OneSource's equity in mutual funds has grown rapidly to \$10 billion in assets [13]. Within the mutual fund industry, Schwab, the market maker, is perceived as threatening and growing too large and gaining control of a significant share of its operating margin. One must consider that a typical no-load fund receives a .5 percent fee for assets it manages for customers. To belong to OneSource, the fund pays Schwab half of its fee, i. e. about \$0.25 for each dollar equity. Given that the largest four no-load funds currently have around \$700 billion in assets under their control, movement of only the \$10 billion under Schwab's current control represents a \$25 million shift in operating margin to Schwab. Fidelity, the largest no-load fund, has set up for protection an equivalent market. Now

said to move goods at the rate of \$30 per second by broadcasting pitches around the clock. These trends are causing retail market erosion and illustrate how electronic markets may affect consumer markets in time. Catalog marketers such as Lands' End sell an enormous amount of merchandise. There are 10'000 mail order companies in the United States selling \$51 billion worth of goods through the catalogs in 1992 [3]. This latter figure rose to \$60 billion in 1994 including catalogs, TV shopping channels and other direct marketing alternatives. Economists, merchants and technologists predict that conventional retailing will hold steady or increase slightly, while technology-driven direct marketing is predicted to surge and capture some 15 % of total sales. If these predictions are correct that would make this new business one of the world's biggest with annual revenues of well of \$300 billion. Not until the appropriate

An Industry Value Chain Evolving within the NII

Once the consumer is interactively reconfigured, a value chain may result, resulting in potential savings in transaction costs and potential substantial savings for the consumer. Following relevant NII elements several areas are discussed where companies can realize opportunities to economize along the industry value chain. Figure 2 depicts various stakeholders and their linkages to the NII. This figure shows only the electronic linkages, but not the physical distribution chains for goods and services which are assumed to exist. The information superhighway infrastructure links: producers of information, producers of physical goods, electronic retailers, electronic markets, physical distribution networks, electronic channels, the market choice box and the consumer.

The market choice box, where a vast amount of electronic commerce will be channeled and controlled, is a server that manages the configuration of workstations, telephones and television sets in the home, and provides a telecommunication interface to those channels that directly reach the home (see Figure 3). The box will present a choice of markets and other activities such as entertainment, shopping, surfing on the Internet, etc. It is anyone's guess how the primary graphical user interface (GUI) will be designed, although it is known that several corporations are working toward such devices. It is important not to bias the consumer to one choice over another, as the initial airline reservation system did for flight choice. Gilder [6] suggested that the ideal GUI may be a newspaper format, an interface designed for human interaction that has indeed passed the test of time. For example, we read a headline, skip to sports, back to the financial page, advertisements catch our attention and we study them in greater detail in order to gain more product information. The primary GUI may also be adaptable to our life styles and it is conceivable that each class of market choice may require a GUI to help explore its potential. An example of such a possible market choice box may be General Magic's Telescript user interface. Such an interface would let the consumer put an interactive agent into the Travel Store on Main Street that would purchase flight tickets and act as a pseudo-electronic market potentially by-passing APOLLO, SABRE, and the travel agents. It is reasonable to speculate that user-interface owner, such as General Magic, would like to appropriate a portion of the resulting value chain and market-maker savings rather than share them with the consumer. This scenario demonstrates easily,

how the market choice box and standards associated with market choice (labeling of catalogue items, marketing of client/server software for products such as Telescript) can all affect the openness of information and market access.

The consumer is the wild card in this scenario. Transaction costs theory requires cost savings that satisfy both parties in the transaction. The potential changes in consumer behavior as he or she takes advantage of the cost opportunities the NII makes possible are on such a large scale, and the electronic transaction capabilities currently available so rudimentary, that our understanding of what the consumer will do is, at best, cloudy. There is some evidence that consumers will choose alternative forms of transactions (catalog and television shopping networks) over retail store transactions, in favor of price, high quality, selection choice, and time savings.

Value Chains Opportunities and Risks

One may identify four areas of opportunity and risk for stakeholders in the NII:

1. *Benefits to the consumer:* The consumer will have free market access to all suppliers willing to pay an interconnection cost. The consumer will have maximum choice at lower price. If and when interactive agents are feasible, the consumer will have access to a market price without market-maker profits attached, but with the more efficient levels of market pricing from single-channel suppliers.

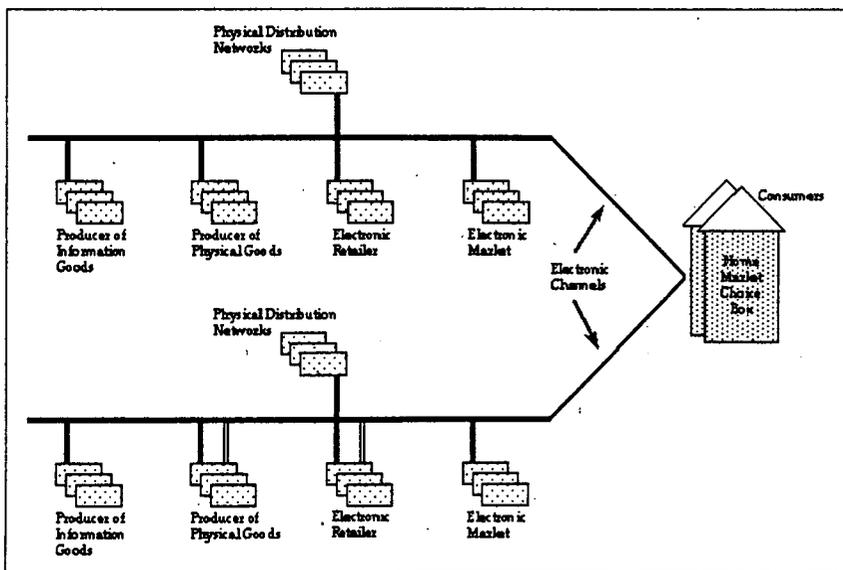


Figure 2: Stakeholders in the value chain connected to the NII

2. *Lower coordination costs throughout the industry value chain:* Electronically linked producers and retailers will be able to lower their costs by reducing intermediary transactions and unneeded coordination because of electronic

transactions directly with the consumer.

3. *Lower physical distribution costs:* Delivery costs will be minimized in two ways. Firstly, information will be transmitted electronically and much lower electronic distribution costs will be substituted. Secondly, as each element of the industry value chain is bypassed, a physical distribution link and related inventory carrying costs will be eliminated (see value chains 2 and 3 in Figure 1).
4. *Redistribution and potential reduction in total profits:* The lesson of the airline reservation systems, the initial behavior of Schwab's OneSource, and market economics indicate that many companies will need to face smaller profit margins. Such smaller profit margins will be may compensated by increased volume.

Issues for the Future

Lastly, policy makers and managers need to address market access and the potential for value-chain configuration. This needs to occur (a) within electronic markets (when the market maker owns or has substantial interests, as this can bias markets in his favor), (b) for electronic channels (when channel ownership might restrict free access) and (c) for the market choice box (when its design might enhance or restrict access to the consumer). Stakeholders in the NII evolution then need to think about the consequences of market constraint, and what legislative

and other policies are needed to ensure a fair playing field. Moreover, stakeholders, such as consumer goods manufacturers, have as many interests in this evolution as do telecommunications and information technology companies,

Value Chain Reconfiguration

Industry value-chain stakeholders must examine whether their place in the chain is threatened and, if so, what long-term strategies to experiment with. Those parties of the consumer value chain need to understand under what conditions the consumer will prefer to purchase from single-source suppliers, brokered electronic markets, and intelligent agent proxies for electronic markets. In order to do so, they must learn how to use the NII in its current rudimentary form and, as its capabilities increase, begin to test their strategies more actively. They need to decide which technologies are crucial for their objectives and goals, and follow their progress closely. Lastly, they need to follow electronic market implementation carefully to learn how the market-maker effect will redistribute profit margins. ■

References

- [1] Bakos, Y.: Electronic Marketplaces, in: MIS Quarterly, September 1991, pp. 295-310.
 [2] Benjamin, R.; Scott Morton, M. S.: Information Technology, Integration and Organizational Change, in: Interfaces, 1988, p. 18, pp. 86-98.

- [3] Brubach, H.: Mail-order America, in: New York Times Magazine, November 21, 1993, p. 55.
 [4] Chandler, A.; Daems, H.: Administrative Coordination, Allocation and Monitoring: A Comparative Analysis of Accounting and Organization in the U. S. A. and Europe, in: Accounting, Organizations and Society, 1979, pp. 3-20.
 [5] Copeland, D.; McKenney, J.: Airline Reservation Systems: Lessons from History, in: MIS Quarterly, September 1988, pp. 362-364.
 [6] Gilder, G.: Telecosm 'Digital Dark-horse-Newspapers', in: Forbes ASAP, October 25, 1993, pp. 139-149.
 [7] Gore, A.: Vice-President of the United States, remarks to the National Press Club, December 21, 1993.
 [8] Anonymous: Hopes and Fears on New Computer Organisms, in: New York Times, January 6, 1994, p. D1.
 [9] Lindsey, D.; Cheney, P.; Kasper, G.; Ives, B.: TELCOT: An Example of the Use of Information Technology in the Cotton Industry, in: MIS Quarterly, December 1990, pp. 347-357.
 [10] Malone, T.; Yates, J.; Benjamin, R.: Electronic Markets and Hierarchies,

in: Communications of the ACM, 1987, pp. 484-497.

- [11] Malone, T.; Yates, J.; Benjamin, R.: The Logic of Electronic Markets, in: Harvard Business Review, May-June 1989, pp. 166-172.
 [12] Miller, D. B.; Clemons, E. K.; Row, M. C.: Information Technology and the Global Virtual Corporation, in Bradley, S.P.; Hausman, J.A.; Nolan, R.L. (Eds.): Globalization, Technology and Competition, Boston 1993, pp. 283-307.
 [13] Anonymous: The Next Giant in Mutual Funds, in: New York Times, March 20, 1994, Section 3, p. 1.
 [14] Office of Technology Assessment: Electronic Enterprises: Looking to the Future, Washington, DC: U. S. Government Printing Office, OTA-TCT-600, May 1994.
 [15] Picot, A.: Ein neuer Ansatz zur Gestaltung der Leistungstiefe, in: Zeitschrift für betriebswirtschaftliche Forschung, 1991, pp. 336-359.
 [16] Picot, A.; Kirchner, C.: Transaction Cost Analysis of Structural Changes in the Distribution System: Reflections on Institutional Developments in the Federal Republic of Germany, in: Journal of Institutional and Theoretical Economics 1987, pp. 62-81.
 [17] Stalk, G.; Evans, P.; Shuman, L.: Competing on Capabilities: The New Rules for Corporate Strategy, in: Harvard Business Review, March-April 1992, pp. 57-69.
 [18] Thornton, E.: Revolution in Japanese Retailing, in: Fortune, February 7, 1994, p. 144.
 [19] Williamson, O.: The Modern Corporation: Origin, Evolution Attributes, in: Journal of Economic Literature, 1981, pp. 1537-1568.

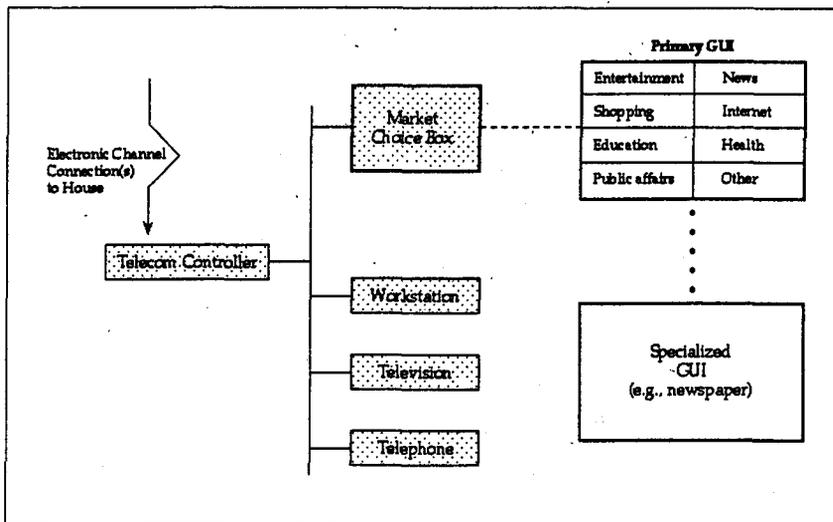


Figure 3: Interfaces of the market choice box

* Dr. Rolf T. Wigand (rwigand@syr.edu) is Professor and Director of the Graduate Program in Information Resources Management at the School of Information Studies, Syracuse University, Syracuse (NY), USA.

Call for Papers for a Special Issue on Electronic Commerce of 'The Information Society'

'The Information Society (TIS)' journal is inviting authors to submit papers for review on the topic of 'Electronic Commerce' for a special issue to be guest-edited by Rolf Wigand. The paper submission deadline is January 15, 1996. 'TIS' is a multidisciplinary journal whose audiences include policy- and decision-makers and scientists in government, in-

dustry and education; managers concerned with the effects of the information revolution on individuals, organizations and society; and scholars with an interest in the relationship between information technologies, social/organizational life, and social change. For this special issue on 'Electronic Commerce' and, in general, 'The Information Society' is interested

in provocative analytical articles or empirical studies that are written to advance our understanding of the relationships among information technology, related social practices and policies, and social change. 'TIS' articles are typically 4,000 to 6,000 words long, and are written vividly with coherent analyses and minimal jargon. For manuscript format details, please contact the editor:

Prof. Rolf T. Wigand, Syracuse University, phone: +1-315 443 5608, fax: +1-315 443 5806, e-mail: rwigand@syr.edu.