Will real estate agents survive?

The transformation of the real estate industry by information technology

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Information technology has the potential to fundamentally and radically reshape organisations and entire industries (Evans and Wurster, 1997; Mendelson and Kraemer, 1998; Porter, 2001). In the airline industry, computerised reservation systems have greatly increased the number of price points and enabled code sharing and various regional and global alliances among airlines. In the book publishing industry, the move to digital technologies in the 1990s changed the industry's basic business model from make-then-sell to sell-then-make. The combination of the MP3 music format and peer-to-peer use of the internet seems poised to fundamentally transform the structure of the music recording and distribution industry (Easley and Michel, 2001).

While information technology has yet to make much impact on the real estate industry, we suggest a fundamental transformation is

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just around the corner. How will the real estate industry be transformed by the ever-increasing power of information technology? Will real estate agents find that their jobs are slowly, but surely, taken over by systems and services provided on the internet? Or will they find that the power of IT enables them to do their job even more effectively?

Over an extended period of time and using multiple research methods, we studied the use of IT in the real estate industry in both the United States and New Zealand. We conducted interviews with real estate agents in the US and New Zealand, held discussions with officials at the national realtor associations in both countries, analysed industry documents and websites in both countries, and conducted surveys of real estate agents. Further details of our research methods and the research project can be found elsewhere (Crowston and Myers, 2004; Crowston, Sawyer and Wigand, 2001; Crowston and Wigand, 1999; Sawyer, Crowston, Wigand and Allbritton, 2003; Wigand, Crowston, Sawyer and Allbritton, 2001). Our findings suggest three potential scenarios for the transformation of the real estate industry by information technology:

SCENARIO 1

Disintermediation of real estate agents (they lose their jobs to IT) and some consolidation of the industry.

SCENARIO 2

Agents dominate the real estate market by using their institutional advantages.

SCENARIO 3

Increase of social capital for real estate agents (they use IT to gain more business).

Before discussing each of these scenarios and predicting which we believe is most likely for the real estate industry, we first explain our approach: the use of three perspectives for studying industries.

THREE PERSPECTIVES ON INDUSTRIES

We believe it is possible to view any industry from three perspectives (see **Table 1**). These three perspectives are the economic, the institutional, and the social and cultural perspectives. We freely acknowledge that we have considerably simplified these perspectives and we do not pretend

TABLE 1

Three perspectives on industries

Perspective	Key focus	Phenomenon of interest	Types of data	Characteristics of industry transformation
ECONOMIC	Relation between inputs and outputs of an industry	The structure of the market: the product, the firms supplying the product, the buyers, and the transactions	Economic data such as costs, profits, numbers of transactions	A change in the structure of the market
INSTITUTIONAL	Contextual issues that surround an industry	Legal and institutional arrangements: the regulatory framework governing an industry; organisations that regulate and constrain interactions	Legal documents, laws, court decisions, interviews with key informants	A change in the regulatory framework and/or legal and institutional arrangements
SOCIAL AND CULTURAL	Processes and structures within an industry	Social relationships and networks, beliefs, norms and values	Notes from fieldwork and observations, interview data, documents	A change in social relations, social structure, social networks and culture

to provide a comprehensive review of the research in these areas. Also, we acknowledge that other perspectives are possible and these perspectives are not mutually exclusive. Bearing in mind these limitations, however, we believe these three perspectives (as we have described them) are a useful starting point for discussing an industry. Table 1 shows that each perspective makes different assumptions and focuses on a different aspect of an industry.

- The economic perspective views an industry as a collection of firms that produce substitutable products. The key focus is on the structure of markets and the relation between inputs and outputs of an industry.
- The institutional perspective views an industry as a set of institutional and regulatory arrangements. The key focus is on the contextual issues that surround an industry.
- The social and cultural perspective views an industry as a set of social and cultural relationships with shared norms, values and beliefs. The key focus is on the social processes and social structures within an industry.

Economic perspective

An economic perspective treats the actors within an industry as rational profit-maximising entities and focuses on the relative costs and benefits of different actions or arrangements. In this perspective, an industry is generally defined as the set of firms that compete with each other. A narrow definition would restrict the industry to firms that supply the same product (e.g., the movie industry, which is the collection of firms that produce movies); a broad definition would include firms that produce substitutable goods (e.g., the entertainment industry, which includes firms that produce movies, television shows, computer games, and run theme parks, etc.). For our purposes, we suggest the economic perspective would consider the real estate industry as a service industry, where the "market" is one where houses are bought and sold. Various players compete within this market (of matching buyers and sellers).

The use of information technology may have various economic impacts on an industry. First, the use of IT can reduce the cost of searching for a product and thus change the set of suppliers considered by a buyer. One phenomenon that has attracted particular attention is disintermediation: this is the idea that buyers and sellers will deal with each other directly, rather than through intermediaries, as the use of IT makes interactions cheaper, allowing buyers and sellers to handle a wider range of interactions. Some predict that the widespread adoption of electronic commerce will lead to the disappearance of all human agents who act "merely" as match-makers – helping buyers find sellers and vice versa (Bakos, 1998; Doherty, 2000; Hess and Kemerer, 1994; Schmitz, 2000). Others, however, disagree with this prediction. Wimmer et al. (2000), for example, note that middlemen do more than simply match buyers and sellers: they also provide immediacy, access to wider markets, and expert analysis that alleviates problems of asymmetric information. While they agree that some middlemen may be replaced by IT, those who provide more than just matchmaking services seem likely to survive (Wimmer et al., 2000). Yet another possibility is re-intermediation, where a new intermediary arises to connect buyers and sellers. Retailers such as Amazon.com and Virtual Vineyards are examples of new "cybermediaries" (Jin and Robey, 1999).

Predictions of disintermediation seem to be borne out in certain industries (Hess and Kemerer, 1994). For example, conventional travel agencies are struggling to survive the double blow of airline commission cuts and online competition (Lewis,

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Semeijn and Talalayevsky, 1998; Lewis and Talalayevsky, 1997). Insurance firms are also struggling with the role of agents as intermediaries in the insurance sales process (Fisher, 2000). But new "cybermediaries" are also emerging, often in these same industries. Travelocity and Expedia compete with conventional travel agencies, allowing customers to make their own travel reservations online. It appears, therefore, that both disintermediation and re-intermediation are occurring simultaneously in some industries.

Second, IT use can change the competitive position of buyers and suppliers (McFarlan, 1984; Porter and Millar, 1985). For example, a company that successfully employs IT to cut costs or to increase service levels may be able to out-compete traditional competitors. These changes can be considered changes to the industry when they lead to changes to the set of suppliers for the product.

Third, IT can reduce transaction costs and may have some impact on the boundaries of the firm (Williamson, 1975; 1981). Transaction cost theory (which extends the neoclassical economic perspective of the firm by recognising the significance of transaction costs in any market exchange) has been used to help explain IT outsourcing decisions in various industries (Ang and Straub, 1998).

Finally, IT can change the nature of the product itself (Venkatraman, 1991). In some cases, information becomes an important part of the good or service. In other cases, the product itself becomes digital (e.g., music CDs, digital videos, online journals). Such changes to the nature of the product can lead to changes in the basis of competition among firms and changes in industry structure.

Institutional perspective

A second perspective that may be used to analyse industries is an institutional one. An institution can be defined as any standing legal entity that exerts influence and regulation over other social entities. Institutions constrain and regularise behaviour and "have the capacity to establish rules, inspect or review others' conformity to them, and as necessary, manipulate sanctions – rewards or punishments – in an attempt to influence future behaviour" (Scott, 1995). Examples of institutions are government agencies, international agencies, professional and trade and industry associations, educational institutions, financial institutions and labour organisations (King et al., 1994).

An institutional perspective looks at an industry as a set of institutional arrangements that govern the production and exchange of certain goods. The focus is on institutions, on the regulatory framework governing an industry and on the rights and responsibilities of participants within it. The institutional perspective can also include factors that pressure organisations to conform in order to maintain legitimacy (Robey and Boudreau, 1999).

In this perspective, an industry is defined more broadly than in the economic perspective. It includes those firms that compete to supply a given set of products, but it also includes the regulatory framework that specifies the allowable competition. Many industries are heavily regulated, especially those that may impact on public safety or the environment (e.g., transportation, utilities and food).

Changes to the regulatory framework of an industry can have far-reaching implications for every single organisation within an industry. Changes to the law or the enforcement of existing law may also significantly affect IT use (e.g., a company called Napster was, in effect, shut down as a result of court action by the Recording Industry Association of America).

As well as a regulatory framework, most industries have national trade and professional associations. These associations usually collect industry data, publish consumer information and trade and industry magazines, hold trade fairs, represent the members of that association to the public, the government, the media and other interested parties, and promulgate and enforce codes of conduct.

Social and cultural perspective

A third perspective that can be used to analyse industries is a social and cultural one. A social and cultural perspective sees an industry as a set of social, organisational and cultural relationships. The focus is on the patterns of interaction among people and organisations within an industry, on shared language and jargon, meanings, norms, beliefs and cognitive frames (Scott, 1995). Researchers might study classification schemes about products, processes and customers, as well as the processes of enculturation, education or training that shape these characteristics.

In this perspective, an industry is defined more broadly than in the institutional perspective. It includes the various institutional relationships within an industry, but it also includes the social relationships and networks between the various people and organisations within it. An industry is the set of firms and organisations whose stakeholders share cultural characteristics and consider themselves to be in the same industry. An industry is thus a socially defined community of discourse with accepted norms, beliefs and values.

Within an industry are accepted norms for manufacturing or product design, accepted ideas of what a product is and what it should look like, and who should do the work (Keller, 1983). The existence of such a culture can be seen in the ease with which people move from one firm to another within the same industry (Phillips, 1994).

We suggest that, as technology changes, the patterns of social interaction and culture within an industry may also change in systematic ways. IT use may lead to industry transformation by changing its social and cultural characteristics. For example, an information system may have a classification system embedded within it and, therefore, users may be forced to adopt the language of the system. Such was the case with the Norwegian drug prescription exchange described by Monteiro and Hanseth (1995). A system may similarly reflect and impose particular sets of values, norms and behaviour, all of which affect the constitution of the industry (Hanseth and Monteiro, 1997).

TRANSFORMATION OF REAL ESTATE INDUSTRY BY INFORMATION TECHNOLOGY

Each of the three perspectives offers particular insights about how the real estate industry might be transformed by IT. **Table 2** summarises the phenomena of interest in this industry from each perspective.

Economic perspective

The economic perspective focuses on the economic performance of an industry (outputs) and on the structure of the market – the product, the firms supplying the product, the buyers and the transactions – and how these might change with the introduction or increased use of IT. The real estate industry is interesting from an economic perspective because houses are expensive and have high transaction costs. Much of the research on electronic commerce has focused at the other end of the spectrum, on low-cost, easily describable commodity or branded goods, such as music CDs. There are several reasons for the high transaction costs. First, houses differ widely along numerous dimensions (e.g., size, location, features), which makes them hard to describe succinctly and increases their asset specificity. Second, real estate transactions are complex, with somewhat high uncertainty and difficulty in measuring outcomes. Finally, transactions are characterised by high information asymmetry, since sellers typically know much more about their houses than buyers. All of these factors increase the perceived risk and cost of the

TABLE 2

Analysis of real estate industry from three perspectives

Perspective	Phenomenon of interest
ECONOMIC	IT-induced reduction in cost of locating properties; disintermediation of real estate agents and increase in FSBOs; development of cyber-intermediaries
INSTITUTIONAL	The use of IT as allowed or mandated by the regulatory environment; the role of MLS and MLS agreements between agents in transactions; rules for being listed on real estate websites; institutional support (or lack thereof) for FSBO real estate sites
SOCIAL AND CULTURAL	Role of agents in contextualising information from databases; use of IT to support social networks of agents, customers and other professionals; IT support for representation schemes

Since real estate agents are pure market intermediaries – they match buyers and sellers, but rarely buy or sell themselves – they are potentially vulnerable if buyers can find sellers directly

transaction. An interesting feature of the real estate industry is that a large proportion of sales are of "used" products rather than new. These sales of existing homes take place between individuals (consumer-to-consumer), unlike new goods, which are sold by companies (business-to-consumer). However, individuals who buy or sell real estate infrequently have little incentive or opportunity to develop much expertise in the process.

The high transaction cost and consumer-to-consumer characteristics of the real estate industry increase the importance of real estate agents as intermediaries. Intermediaries, traders or match-makers are essential players in the economy in that they create desirable efficiencies and provide expertise to reduce the problems of asymmetric information (Wimmer et al., 2000). Economists have long argued for the importance and theoretical justification for intermediaries (Wigand, 1997; 2001).

One view of the role of real estate agents is that they help reduce the transaction cost for an individual buyer. For example, an agent can reduce contact cost by use of a listing service (discussed below), reduce contracting cost by providing standardised contracts, monitor performance and so on. Agents might also address some of the transaction attributes, e.g., by providing specialised knowledge to help buyers more quickly determine if a house is appropriate (thus managing asset specificity) and by providing transaction support (thus managing transaction complexity and information asymmetry). Clearly, transaction costs cannot be entirely avoided, since agents must be paid, but the cost of the agent could be less than the transaction costs borne by a buyer who does not use an agent (Schmitz, 2000; Wimmer et al., 2000). Finally, for most buyers and sellers, agents are seen as necessary insurance against the risk of a transaction gone bad.

Despite the potential advantages of human intermediaries, many professions, trades and industries are facing the potential of disintermediation, since IT can often provide similar services at a reduced cost. For example, the use of IT might reduce search costs to the point where a human intermediary is unable to compete. IT might also be used to provide information about the process of a sale, thus reducing the perceived risk. Since real estate agents and real estate firms are pure market intermediaries – they match buyers and sellers, but rarely buy or sell themselves – they are potentially vulnerable if buyers can find sellers directly. For example, buyers and sellers can now use the internet to list and search for houses themselves, bypassing traditional real estate agents, who used to have a monopoly on providing information about listings. eBay, which revolutionised consumer-to-consumer sales by enabling individual buyers and seller to easily find each other, now allows real estate listings. If the value added by agents is merely a source of information about listings or reassurance about the process, their position is vulnerable and they may become victims of disintermediation.

Indirect and circumstantial evidence shows that these developments have indeed had an impact on this profession. Several studies, including research by the National Association of Realtors, found that 60 per cent of all housing purchases in the US start on the internet. While brokers still control four out of five real estate transactions, the number of homes sold directly by their owners ("for sale by owner" or FSBO sales) has increased in recent years (Fletcher and Wright, 1997). More than 3600 individual websites have been created in the US to sell homes, most newspaper advertisements now appear online, and FSBO listing registries have emerged (National Association of Realtors, 1998).

Real estate agents have begun to realise the disruptive potential of the internet (Bottenberg, 1998; Harper, 1997; Self, 1997). For agents, the major challenge in these developments is to figure out a way to add sufficient value in the real estate transaction such that they are able stay "in the middle". Some agents are adopting these new communications channels for their own use. For example, Lloyd Anderson, a Harcourts rural sales consultant based in Gore, New Zealand, listed more than 70 of his properties on the internet (Real Estate Institute of New Zealand, 1999). Anderson is cited in August, 1999, as having received more than 670 inquiries from around the world on one property in two months, with the internet leading directly to a sale in excess of $NZ3 million (about $US1.6 million). Other agents are stressing individual service and creating other value-adding mechanisms, such as buyer-broker relationships, connections to other house-buying services, buy/sell deals and guarantees.

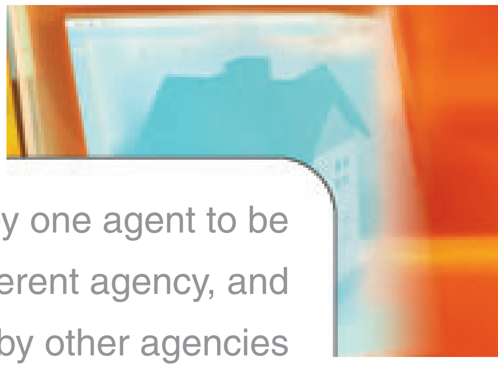
In summary, an economic perspective focuses on changes in the costs of various transactions due to factors such as changes in access to information. Analysis from this perspective leads to the prediction of disintermediation as buyers and sellers seek to save the agent costs. This shift would be reflected in a growing proportion of homes sold by owners.

Institutional perspective

An institutional perspective on the real estate industry focuses on legal and institutional arrangements – the regulatory and contractual framework governing the industry and the organisations that regulate and control interactions – and how these institutions shape and are shaped by the use of IT. To understand the industry from this perspective, it is necessary to understand the current arrangements between buyers, sellers and agents, so we will first briefly describe a typical sale. To highlight the importance of the institutional perspective, we will compare the practices in the US and New Zealand.

Typically, a seller agrees to list a property with a real estate agent, called the listing or selling agent (as noted above, only a minority of sellers sell their properties without an agent). The agent advises the seller on the various decisions about selling the house (e.g., pricing) and markets the house to potential buyers (e.g., by placing advertisements, holding open homes or putting a picture in the agency's shop window). In return for these services, the agent collects a commission when the house is sold (on the order of five-seven per cent of the selling price in the US, with wide variation by locale, price of the house, etc.). The relationship between the agent and the seller and buyer is governed by the contract they sign, law, professional licensing standards and professional codes of ethics.

An essential institutional difference between New Zealand and the US is the use of a multiple listing service (an MLS, also called a multiple listing bureau, or MLB) in the US. An MLS is a database of the houses listed by member real estate agencies. Originally, the MLS was a printed book, but today it is a computer database of listings that can be searched by member agents. In the US, nearly every area has an MLS to which essentially all agencies belong and agencies typically include all of their listings in the MLS (a significant exception is New York City, but even there one may soon be developed). But the MLS is much more than just technology. An MLS, strongly influenced by the legal frameworks and professional codes of conduct in each country, contains encoded rules of conduct and role definitions for the industry, and thus influences practice. In particular, the MLS agreement in the US provides a framework for limited co-operation among agents. For example, the MLS agreement generally allows member agents to show houses listed by other agents (using a lockbox to access the house when the sellers are away) and requires selling agents to share their commission with any agent who brings in a buyer (and not with any non-agent). As a result, it is common in the US for a house listed by one agent to be sold by a different agent working for a different agency, and for an agent to show houses listed by other agencies. Even though agents represent opposite sides of the transaction, the MLS



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agreement ensures that both are paid by the seller.

The use of the MLS in the US gives agents a considerable information advantage. On the buyers' side, the availability of information in the MLS makes it much easier for an agent to identify desirable properties, thus encouraging buyers to work with agents. (Since the seller pays the agent's commission, there is no direct cost to the buyer for working with an agent.) Historically, this control over listing information was jealously guarded. On the seller's side, houses that are not listed with an agent are kept out of the MLS, which dramatically reduces the number and quality of prospective buyers (since most buyers work with an agent). Indeed, in some locales, agents have been able to have ordinances passed banning "For Sale" signs, thus increasing the value of the MLS. Because of the importance of the MLS, agents market primarily to each other and secondarily to the general public (in fact, some of the US agents interviewed felt that open houses for the public were ineffective and a waste of time).

In New Zealand, MLBs existed in Auckland and Christchurch, but these recently closed (as discussed below). Even when they were in operation, only a fraction of the agents in these two cities belonged and even those who did belong did not list all their properties. The lack of success of both these MLBs can be explained by the institutional arrangements in this country. New Zealand has about half a dozen large real estate firms and these firms compete fiercely with one another. Agents who work for a particular firm generally do not co-operate with agents in other firms because there is no institutional structure comparable to the US MLS agreement that encourages them to do so.

Working within an institutional framework that encourages competition and discourages co-operation, it is not normal practice for agents to co-operate or share their commission with agents in other firms. Agents show only their own firm's properties, so buyers must check with each agency in an area to be sure of seeing all offered properties. Agents try to convince sellers to list with their own firm only (called an "exclusive listing") and actively discourage sellers from listing with multiple agencies (e.g., by offering less support to such listings). Once they have captured an exclusive listing, agencies then focus their efforts on advertising directly to potential buyers, perhaps to compensate for the potential reduction in the number of buyers caused by the absence of shared listings. Agencies have large shop windows with displays of houses for sale. Most buy large amounts of advertising and the largest firms produce their own glossy advertising magazines. For sale signs are large (two metres by two metres is not uncommon) and provide a large amount of information about the property offered. New Zealand real estate agents hold many more open homes than is typical in the US (at least once a week for several weeks, rather than one or two). This approach may mean more work (i.e., economically less efficient) for buyers, but persists because of the institutional support.

The difference in institutional context has also affected the impact of the agents' use of the worldwide web. In the US, real estate agents' websites are often a presentation of their MLS listings, as is the national site – www.realtor.com – run by the National Association of Realtors (NAR). In New Zealand, the national website developed by the Real Estate Institute of New Zealand (REINZ) – www.realenz.co.nz – allows a buyer to compare listings across multiple real estate agents. But the only way to get a listing on the website is to list with an agent and the only way to buy a listed property is to deal with the agent. Thus, as might be expected, the REINZ website does not affect the basic relationship between agents, sellers and buyers. The respective websites thus seem to reinforce the existing institutional arrangements rather than change them.

The position of agents could be threatened by the emergence of competitive FSBO listing sites. As with eBay, such sites could allow buyers and sellers to find each other directly rather than having to employ an agent (of course, they would have to also take on the other functions performed by agents).

Although such sites are numerous, none seems to have the critical mass needed to be successful. Indeed, many have folded. From an institutional perspective, a critical difference is that the real estate agent sites can piggyback on the existing infrastructure for listings and advertising. In contrast, the FSBO world has no central player. Most sellers are selling only a single house and have little chance to develop expertise or economies of scale in the process. Furthermore, the NAR and REINZ encourage agents to avoid real estate sites that mix listed and FSBO properties, thus limiting competitive sites to only FSBO advertisements, further decreasing their appeal.

A question raised by this analysis is why some other established organisation does not take a leading role in organising the FSBO market. For example, newspapers run ads from both real estate agents and individuals in their local markets and many have made their advertisements available on their websites. One hypothesis for this behaviour is that newspapers derive more revenue from real estate agents, who are regular customers, than they do from individuals and so are reluctant to become active competitors. Over the past year, however, TradeMe New Zealand has started online auctions for cars. It may be just a matter of time before TradeMe or some other non-real estate company takes a leading role in organising the FSBO market for real estate.

In summary, the institutional perspective emphasises the importance of the regulatory environment and institutional arrangements in shaping the use of technology. This perspective helps to explain the differences in how IT is being used in New Zealand and the US. In the US, it is in the agents' interest to use the MLS; in New Zealand, it is not. What is rational in one country is not so in another. We can see, therefore, that the institutional perspective helps us to understand more fully how IT can transform an industry and how that industry uses IT.

Social and cultural perspective

A social and cultural perspective looks at the social structure and culture of the real estate industry in a region, state or country. This social structure and culture influences what agents, buyers, sellers and other parties believe about their industry (their norms and values) and how it should operate (their practice). This perspective leads to an examination of agents' social networks along with a study of shared industry language and jargon, meanings, norms, beliefs, cognitive frames and classification schemes about products, processes and customers, as well as the processes of enculturation, education or training that shape these characteristics.

From a social and cultural perspective, the use of IT leads to the increased availability of information about properties to all the parties, but much of this information is "de-contextualised", meaning that it may not be clear how it applies to a particular situation or circumstance. Real estate agents often have stories to tell about the local neighbourhood, about the relative merits of schools in the area, the local shopping centres and so forth. While the basic data is usually available from various sources, buyers may need help interpreting and putting the data into context. In this way, the social network, and especially the strong local ties, represent the added value that the agent provides during the sale process. Additional sources of de-contextualised information, such as listings, FAQs, etc., may not reduce the perception of risk for customers who have little experience with the complexities of real estate. Rather, these individuals need access to embodied expertise and other resources.

From this perspective, the primary value that an

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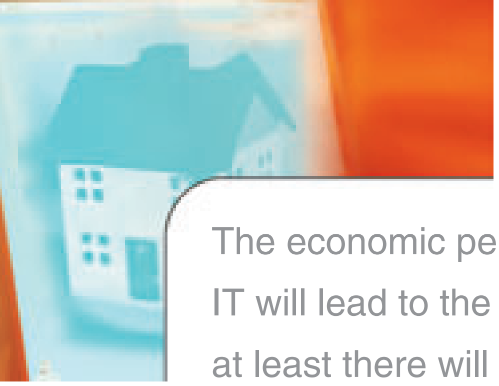

The economic perspective suggests that the increasing use of IT will lead to the disintermediation of real estate agents or that at least there will be some consolidation within the industry

agent provides to a customer continues to be access to the agent's established social network of value-adding players. Expertise is much more important than simple listings data and much harder to replace with technology. For example, since most buyers need legal advice on the transaction, real estate agents often seek out and form strong relationships with lawyers who will help their clients (and vice versa: lawyers seek to develop relationships with agents who will bring them business). These relationships certainly have an economic aspect, but the economic transactions are built on social relationships of trust and reciprocity. A listing of lawyers in the phone book or an online equivalent is not a replacement for a recommendation from an agent or a friend. The agent provides a certain comfort level that the transaction will be completed satisfactorily.

A social perspective suggests that the increased use of IT by real estate agents may enable them to extend their social networks and thus increase their social capital (Kraut, Rice, Cool and Fish, 1998; Kraut et al., 1998). Increased connectivity (via cellular phones, pagers and email) allows a real estate agent to more easily maintain contact with the members of his or her social network. The increasing use of certain technologies also makes it easier for potential customers to contact the agent. And, as we mentioned earlier, an internet presence can extend the agent's reach. Contemporary "web-savvy" agents often have their listings on personal websites, organisational websites (such as local franchise sites), co-operative sites (such as www.homehunter.com) and the National Association of Realtors' website.

Another focus of this perspective is on the use of language and cognitive schemes by individuals in the industry. The real estate industry uses a specific representation scheme to describe properties. These schemes capture and represent the characteristics of houses important to buyers, such as the number of rooms, construction materials, special features, etc. These schemes are embodied in and, therefore, affected by the introduction of a system such as an MLS. The technology can lead to changes in several ways.

First, when an MLS is introduced, it is necessary to standardise the descriptions of properties. Technological limitations may require pruning of descriptions. In order to provide search facilities, systems impose a standard format and selection of fields. Standards can differ among regions, reflecting the diverse needs of these areas. As MLS systems move on to the web, though, two additional changes become necessary. First, because the web versions of the systems are open to the general public, the presentation of the information has to change. Professionals who use a system every day can be expected to learn abbreviations, labelling conventions, etc., but an occasional user requires a more explicit presentation. More importantly, though, to integrate separate MLS systems into a seamless web presence, it is also necessary to integrate the representation schemes they embody.

CONCLUSION

Each of the three perspectives offers a different view of the relationship between the real estate industry and IT. Bearing in mind the provisos we made earlier, the economic perspective suggests that the increasing use of IT will lead to the disintermediation of real estate agents or that at least there will be some consolidation within the industry. The institutional perspective suggests that real estate agents may be able to put their institutional advantages to good use, but the use of IT in the real estate industry will vary considerably by country and or region. The social and cultural perspective suggests that IT may lead to an increase in the social capital of agents.

There are thus three potential scenarios for the transformation of the real estate industry by information technology. Although we are not advocates of technological determinism – that technology is the primary driver for industry changes (Orlikowski, 1992) – we do think that some scenarios are more likely than others. We suggest that the real estate industry is most likely to be transformed as follows:

- Many real estate agents will find it hard to survive and some may well be subject to disintermediation. Most likely there will be some consolidation within the industry (Scenario 1).

- In some countries and regions, agents may be able to succeed by using their institutional advantages, e.g., by excluding FSBO sales from any agent-controlled system (Scenario 2). However, there seems to be nothing to stop an independent company from setting up a competitive site for FSBO sales in New Zealand.
- A few real estate agents and firms will succeed in using information and communications technology to their own advantage (Scenario 3).

Although it is always dangerous to predict the future, we suggest that the future for the real estate industry in New Zealand is some combination of Scenarios 1 and 3. That is, we believe there is likely to be some consolidation within the industry. Many real estate agents and firms may find it harder to survive and some agents may lose their jobs and be subject to disintermediation (particularly if a new independent intermediary such as a TradeMe or eBay enters the market). However, a smaller number of real estate agents will use ICT to handle even more customers. They will succeed by using information and communications technology to their own advantage.

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REFERENCES

Ang, S., & Straub, D.W. (1998). Production and Transaction Economies and IS Outsourcing: A Study of the U.S. Banking Industry. *MIS Quarterly,* 22(4), 535-552.

Bakos, Y. (1998). The emerging role of electronic marketplaces on the Internet. *Communications of the ACM,* 41(8), 35-42.

Bottenberg, T.A. (1998). *Making the Internet Work for REALTORS® or, Getting Serious about the Web!* Retrieved December 2, 1998, from http://www.ired.com/web-biz/abc0.htm

Crowston, K., & Myers, M.D. (2004). Information Technology and the Transformation of Industries: Three Research Perspectives. *Journal of Strategic Information Systems, forthcoming*.

Crowston, K., Sawyer, S., & Wigand, R. (2001). Investigating the interplay between structure and information and communications technology in the real estate industry. *Information Technology & People,* 14(2), 163-183.

Crowston, K., & Wigand, R. (1999). Real estate war in cyberspace: An emerging electronic market? *International Journal of Electronic Markets*, 9(1-2), 1-8.

Doherty, J. (2000). Bye-Bye, middleman. *Barron's*, 80(4), 17.

Easley, R.F., & Michel, J.G. (2001). *Open Standards, Information Systems Strategy, and Adoption of Innovative Technology: The Case of the Recording Industry and the MP3 Standard.* Paper presented at the International Conference on Information Systems, New Orleans.

Evans, P.B., & Wurster, T.S. (1997). Strategy and the New Economics of Information. *Harvard Business Review*, 75(5), 71-82.

Fisher, S.E. (2000, February 21). Internet shakeup for insurance. *InfoWorld,* p. 34-5.

Fletcher, K., & Wright, G. (1997). Strategic and organizational determinants of information system sophistication: an analysis of the uptake of database marketing in the financial services industry. *European Journal of Information Systems,* 6(3), 141-154.

Hanseth, O., & Monteiro, E. (1997). Inscribing Behaviour in Information Infrastructure Standards. *Accounting, Management and Information Technologies,* 7(4), 183-211.

Harper, J. (1997). *How to Fix the Real Estate Web*. Retrieved December 2, 1998, from http://www.retechtrax.com/today.html

Hess, K., & Kemerer, C. (1994). Computerized loan origination systems: An industry case study of the electronic markets hypothesis. *MIS Quarterly*, 18(3), 251-75.

Jin, L., & Robey, D. (1999). Explaining Cybermediation: An Organizational Analysis of Electronic Retailing. *International Journal of Electronic Commerce*, 3(4), 47-65.

Keller, J.F. (1983). Division of labor in electronics. In J. Nash & M.P.F. Kelly (Eds.), *Women, Men, and the International Division of Labor* (pp. 346-373). Albany: State University of New York Press.

King, J.L., Gurbaxani, V., Kraemer, K.L., McFarlan, F.W., Raman, K.S., & Yap, C.S. (1994). Institutional Factors in Information Technology Innovation. *Information Systems Research*, 5(2), 139-169.

Kraut, R., Rice, R.E., Cool, C., & Fish, R.S. (1998). Varieties of Social Influence: The Role of Utility and Norms in the Success of a New Communication Medium. *Organization Science*, 9(4), 437-453.

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Kraut, R.E., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53(9), 1017-1031.

Lewis, I., Semeijn, J., & Talalayevsky, A. (1998). The impact of information technology on travel agents. *Transportation Journal*, 37(4), 20-25.

Lewis, I., & Talalayevsky, A. (1997). Travel agents: Threatened intermediaries? *Transportation Journal*, 36(3), 2630.

McFarlan, F.W. (1984). Information Technology changes the way you compete. *Harvard Business Review*, 62(3), 98-103.

Mendelson, H., & Kraemer, K.L. (1998). The Information Industries: Introduction to the Special Issue. *Information Systems Research*, 9(4), 298-301.

Monteiro, E., & Hanseth, O. (1995). Social shaping of information infrastructure: on being specific about the technology. In W.J. Orlikowski, G. Walsham, M. Jones & J.D. DeGross (Eds.), *Information Technology and Changes in Organizational Work* (pp. 325-343). London: Chapman and Hall.

National Association of Realtors. (1998). *You Own It . . . Protect It!*, from http://www.realtor.com

Orlikowski, W.J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science*, 3(3), 398-427.

Phillips, M.E. (1994). Industry mindsets: Exploring the cultures of two macro-organizational settings. *Organization Science*, 5(3), 384–402.

Porter, M.E. (2001). Strategy and the Internet. *Harvard Business Review*, 79(3), 63-78.

Porter, M.E., & Millar, V.E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63(4), 149-160.

Real Estate Institute of New Zealand. (1999, November). *Internet Success in the Deep South*, from http://www.reinz.org.nz/ Accessed 28 May, 2000.

Robey, D., & Boudreau, M.-C. (1999). Accounting for the Contradictory Consequences of Information Technology: Theoretical Directions and Methodological Implications. *Information Systems Research*, 10(2), 167-185.

Sawyer, S., Crowston, K., Wigand, R., & Allbritton, M. (2003). The social embeddedness of transactions: Evidence from the residential real estate industry. *The Information Society*, 19(2), 135-154.

Schmitz, S. (2000). The effects of electronic commerce on the structure of intermediation. *The Journal of Computer-Mediated Communication*, 5(3), Available online at http://www.ascusc.org/jcmc/vol5/issue3/schmitz.html

Scott, W.R. (1995). *Institutions and Organizations.* Thousands Oaks, CA: Sage Publications.

Self, T. (1997). *The Agent and the Web*, December 2, 1998, from http://www.ired.com/web-biz/agents0.htm

Venkatraman, N. (1991). IT-induced Business Reconfiguration. In M.S. Scott Morton (Ed.), *The Corporation of the 1990s* (pp. 122-158). New York: Oxford University Press.

Wigand, R. (1997). Electronic commerce: Definition, theory and context. *The Information Society*, 13(3), 1-16.

Wigand, R., Crowston, K., Sawyer, S., & Allbritton, M. (2001). Information and communication technologies in the real estate industry: Results of a pilot survey. In S. Smithson, J. Gricar, M. Podlogar & S. Avgerinou (Eds.), *European Conference on Information Systems (ECIS)* (pp. 339-343). Bled, Slovenia.

Williamson, O. (1975). *Markets and hierarchies: Analysis and antitrust implications*. New York: The Free Press.

Williamson, O. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87, 548-577.

Wimmer, B.S., Townsend, A.M., & Chezum, B.E. (2000). Information Technologies and the Middleman: The Changing Role of Information Intermediaries in an Information-Rich Economy. *Journal of Labor Research*, 21(3), 407-418.

FURTHER READING

An excellent introduction to the topic of how IT can fundamentally and radically reshape organisations and entire industries is the article by Evans and Wurster (1997). The emergence of electronic marketplaces on the internet is discussed by Bakos (1998). A more detailed discussion of the three theoretical perspectives and their relevance for the real estate industry can be found in Crowston and Myers (2004).