

Designing Mature Internet Business Strategies: The ICDT Model

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This paper illustrates a systematic approach to the analysis and classification of business-related Internet strategies, as well as a framework to guide the strategy-building process of companies aiming at redesigning or innovating their products and services in the light of new opportunities and competitive pressures generated by the spread of the Internet. First, the paper shows that current strategies adopted by large and small companies worldwide have been generally based on a narrow, unidimensional interpretation of the Internet, as either an *Information*, a *Communication*, a *Distribution* or a *Transaction* channel (*ICDT Model*). The model is then used as a systematic framework guiding (1) the analysis of how traditional products and services are redesigned in the light of the Internet, and (2) the identification of organisational adjustments companies need to undergo in order to fully exploit the business opportunities created by the Internet. © 1997 Elsevier Science Ltd

Introduction

Given the rapid penetration of the Internet, and in particular of the World Wide Web, companies worldwide have been involved over the last year in planning and experimentation aimed at leveraging this new technological infrastructure for business purposes. In a first phase, companies have embraced Internet and established web presence at a remarkable pace (Burnellis, 1995; Cockburn and Wilson, 1996; Pitkow and Kehoe, 1996), mainly motivated by the fear of missing an opportunity or of damaging their image by not doing so.

According to several surveys, companies worldwide have started extending their Internet-related activities following a 'goldrush' model unsupported by a clear strategy. Nevertheless, this first phase of Internet penetration in business has allowed companies to (re)discover the Internet as an efficient tool to support business intelligence and R&D environmental scanning (Gordon, 1995; Press, 1994) (leveraging the low cost access to information resources accessible through the Internet), and to improve the quality and efficiency of internal information and communication systems through the set-up of 'Intranets' (Gow, 1996) (leveraging the low cost data, mail, voice and video communication features of the Internet).

As with other technological innovations, this first phase is followed by a new phase of 'mature' application of the technology. Such a phase is characterised by companies (1) requiring their Internet-related investments to result in measurable returns or cost reduction, and (2) developing a clear strategy – aligned with the specific business objectives and values – to guide in a systematic way the identification of the type and range of products and services to be developed and/or redesigned in the light of the Internet.

The ICDT Model illustrated in the next section enables the classification of Internet strategies adopted by companies in the 'maturity' phase by segmenting the space of business opportunities created by the extensive spread of the Internet and its related basic services, such as electronic mail and the World Wide Web. The ICDT Model provides the basis for identifying how, during this phase, existing products

and services will be extended and redesigned, as well as the characteristics of completely new services whose conception and development has been made possible by the Internet. This transformation process is illustrated and discussed in the following two sections. The article concludes using the ICDT Model to extrapolate trends and to outline research directions to further understand the impact that Internet is having and will have on business.

products and services they offer. Functioning like a large billboard accessible flexibly, globally and at low cost, the World Wide Web has opened up a new marketing channel for all the economic agents, from large companies displaying catalogues of their products and services to individuals seeking employment or business partners. Accordingly, from a consumer perspective, the VIS created by the Internet has provided a new, efficient approach of gathering information and comparing market offers.

The ICDT Model and the Four Virtual Business Spaces

The ICDT Model takes its name from the segmentation of the space of new business opportunities created by the Internet into four 'virtual spaces': a virtual information space, a virtual communication space, a virtual distribution space and a virtual transaction space. This segmentation emphasises that the Internet has extended the traditional market space (i.e. the locus, with its associated interaction modes, in which economic agents engage in business activities) by providing new spaces in which economic agents can interact by exchanging information, communicating, distributing different types of products and services, and initiating formal business transactions (see Figure 1).

In terms of Internet strategy, the VIS is one of the four virtual spaces which has most attracted the attention of companies during the first Internet development phase. As a result, the World Wide Web has become rapidly crowded (Minio, 1994; Pitkow and Kehoe, 1996), with multimedia presentations of product and service providers from practically every business sector. During this phase it is interesting to observe that companies have established their VIS 'presence' (1) without an in-depth rethinking of their marketing and advertising strategy, and (2) by approaching the Internet primarily as a traditional broadcast medium (such as television, radio, printed press, etc.). As a next step, a second generation of more 'mature' strategies for the commercial exploitation of the new virtual information space is emerging, driven by companies able to (1) integrate the new Internet-based channels into the company's marketing strategy, and (2) exploit the uniquely differentiating characteristic of the Internet – its interactivity – to develop new forms of effective Internet-based market information exchange. In parallel, the advanced exploitation of the virtual information space is characterised by the appearance and consolidation of new VIS-related services (Sarkar *et al.*,

The Virtual Information Space

The virtual information space (VIS) consists of the new Internet-based channels through which economic agents can display information about themselves, and the

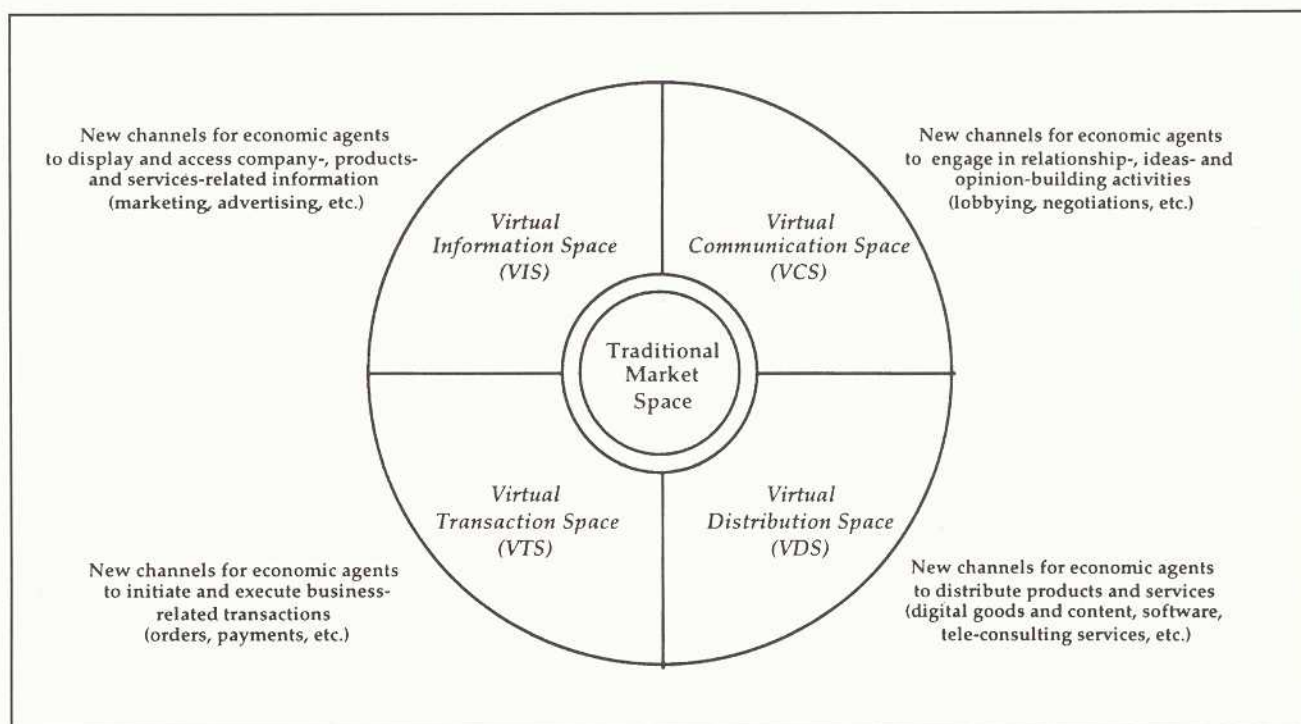


Figure 1 The Four Virtual Spaces

1995), addressing both companies (e.g. Internet marketing and advertising consulting services) and consumers (e.g. information locators, gathering and filtering agents, etc.).

The Virtual Communication Space

The virtual communication space (VCS) is the extension of traditional spaces in which economic agents meet to exchange ideas and experiences, influence opinions, negotiate potential collaborations, lobby, engage in relationships and create different types of communities. The Internet has extended such traditional spaces by providing new channels for the creation of virtual communities of interest whose members can communicate at high speed, low cost, and bypass traditional physical and geographical constraints. Such channels include simple Internet-based news- or user-groups (Armstrong and Hagel, 1996) up to sophisticated 3D spaces in which individuals 'meet' (in the virtual sense of the word) to engage in different types of communication (Halfhill, 1996; Ian, 1994; Loeffler, 1993). The resulting increased level of global interaction among economic agents still has an unclear but potentially important impact on product and service providers, at least to the extent in which communication activities (mainly among consumers) taking place in this new virtual communication space contribute in influencing market and industry trends.

Contrary to the VIS, the VCS is one of the four virtual spaces which has least attracted the attention of companies during the first Internet development phase, probably because it does not correspond to any of the traditional functions such as marketing, distribution and transaction processing. First steps companies are undertaking in the VCS consist of establishing different monitoring mechanisms, and will probably lead in a second stage to the development of strategies aimed at proactively influencing communication activities and business-related opinion-building processes taking place on the Internet.

The Virtual Distribution Space

The virtual distribution space (VDS) represents a new distribution channel suitable for a variety of products and services. A first category of products which can be efficiently distributed via the Internet are products which can be digitised and transmitted through computer networks. Electronic books, articles, pictures, digital music and video tracks belong to this category, together with all the categories of software and electronic data (from computer games to database management systems).

A second domain in which the Internet can be used as a distribution channel is the one of 'non-physical' services such as text-, voice- or video-based consulting, and training.

Third, the Internet can be used to distribute to customers the auxiliary services associated with a traditional service (e.g. a transportation service) or product (e.g. 'physical' products such as cars, hardware or perfume) they have acquired. In this last case, providers can enhance the attractiveness of their traditional products and services by allowing their customers to access customer support and consulting services, product- or service-related information, training and updates. Depending on their nature and on technical limitations, products and services taking advantage of the virtual distribution space can be delivered either real-time, through point-to-point or multi-point connections over the Internet, or asynchronously (e.g. through the download of digital products or through an exchange of electronic messages).

Similar to the developments in the virtual information space, the advanced exploitation of the virtual distribution space is characterised by the appearance and consolidation of specific VDS-based services and products companies can use to efficiently organise, support or outsource their distribution logistics on the Internet. These new services and products range from distribution services to communication software packages that companies can use to set up text- or video-based on-line consulting services for their customers.

The Virtual Transaction Space

The virtual transaction space (VTS) consists of the new Internet-based channels through which economic agents can exchange formal business transactions such as orders, invoices and payments. In the first phase of development, the Internet has not yet been extensively used as a transaction space, mainly because of its underdeveloped legal, security and reliability aspects (Hoover, 1995). The identification of technically mature solutions and industry standards, together with the development of the necessary infrastructure of transaction processing services, in particular in the domain of electronic payments, are necessary preconditions for enabling companies to exploit the new virtual transaction space on a wider scale.

The Four Dimensions of Internet Presence

The ICDT Model provides the basis for distinguishing between four separate types of business-related 'Internet presence'. Each one of these types reflects the intention of economic agents to exploit the new virtual spaces created by the Internet through initiatives aiming at:

- I. increasing the visibility and improving the perception of products or services through Internet-based marketing or advertising initiatives ('VIS presence');

2. increasing the visibility and improving the perception of products or services by monitoring and influencing how economic agents communicate about them and their competitive environment via the Internet ('VCS presence');
3. reducing the cost, improving the quality, or innovating products or services by distributing them, parts of them, via the Internet, or by using the Internet to distribute related, auxiliary services ('VDS presence'); and
4. reducing the cost, improving the quality, or innovating products or services by exploiting the Internet for product/service-related transactions ('VTS presence').

As illustrated in Figure 2, each dimension of Internet presence can be further classified in terms of its technical sophistication (simple or advanced) and level of customisation. For instance, a simple, generic VIS presence can be established by publishing marketing and advertising material related to a product or service offered by a company, while an advanced VIS presence might include sophisticated, interactive multimedia presentations (e.g. 3-dimensional, animated product presentations or interactive entertainment experiences conveying indirectly information about the features of a given product or service). To reach a high level of customisation, VIS presence might include mechanisms designed to (1) gather data on how potential or current customers interact with the company's Internet site (e.g. monitoring the time spent on given pictures or Web pages), (2) infer their preferences, and then (3) react through personalised replies. Such a high level of customisation reflects new forms of Internet-based, direct or one-to-one marketing (Rayport and Sviokla, 1995). Analogously, VDS presence can have different degrees of technical sophistication (from simple file transfers to complex environments supporting real-time,

on-line customer support and problem solving via the Internet) and customisation (from generic to customer-tailored distribution).

The distinction between different dimensions and characteristics of Internet presence represents a first step towards a systematic analysis of the patterns adopted by economic agents from different sectors or geographical regions in incrementally extending their Internet-related activities (i.e. in selectively 'colonising' the four ICDT virtual spaces by establishing VIS, VCS, VDS or VTS presence). For instance, a recent analysis of Internet activities in the banking sector based on the ICDT Model contributes to a better understanding of Internet strategies adopted by major economic agents in this particular sector – the top 25 banks listed in Fortune 500 (Angehrn and Meyer, 1997). The analysis reveals that large banks have initially focused their Internet strategies on a massive but relatively simple and generic VIS presence. Very few of them have started establishing simple and generic VTS presence by supporting a still limited number of Internet-based financial transactions (e.g. opening and operating transactions on personal accounts via the Web). It is only in a second stage, under the competitive pressure from new operators in this sector, e.g. Security First Network Bank (Internet, 1996), that large banks are likely to extend their Internet strategy to the new communication and distribution spaces, establishing at least a simple VCS presence, for instance, by allocating personnel to monitor and intervene in discussion groups and other Internet-based interaction spaces such as MOOs (December, 1996), and to consider higher levels of VTS and VDS presence by extending the number and type of Internet-based transactions, and by distributing products such as banking-related training modules, video-based consulting and customised on-line services.

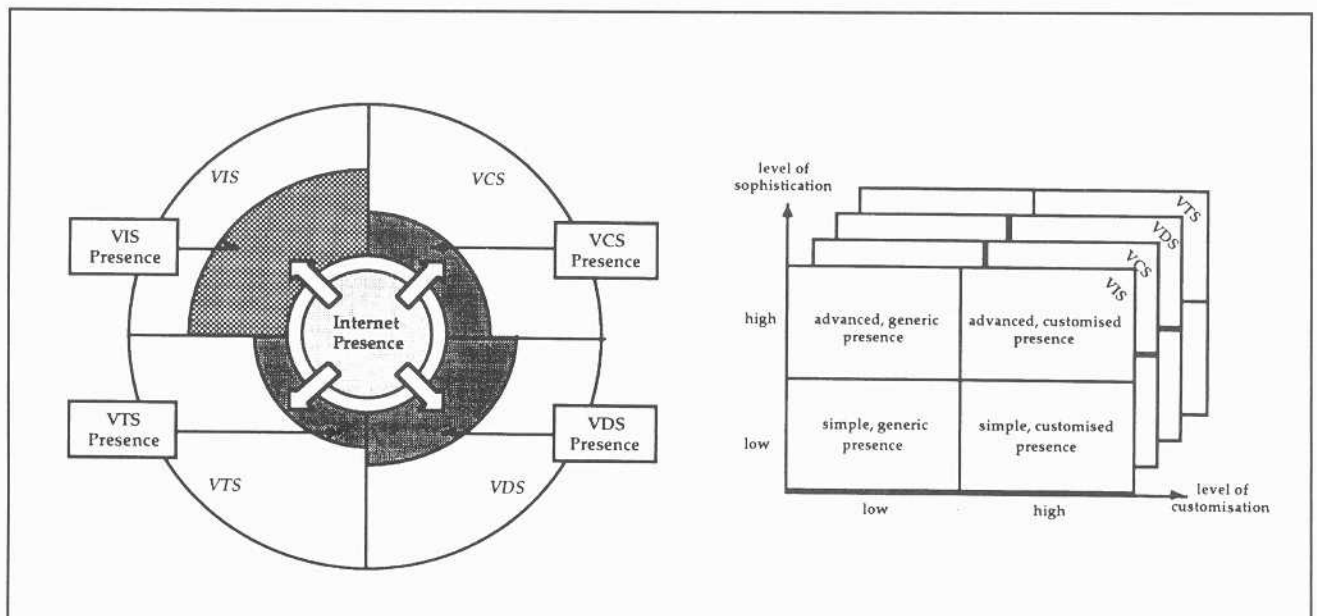


Figure 2 ICDD Dimensions of 'Internet Presence' and Types of Associated Strategies

Internet-enabled Product and Service Redesign and Innovation

The ICDT Model also provides a framework for describing and analysing the impact of the Internet on the evolution and extension of the market offer, providing a better understanding on how economic agents proceed in:

1. gradually adapting and transforming the nature and perception of a number of traditional products and services in the light of the new business opportunities and competitive pressures created by the Internet, and
2. launching new substitute or complementary products and services, positioning them in one or more of the ICDT virtual market spaces described above.

The ICDT Model indicates the four dimensions along which Internet strategies aiming at the redesign of traditional products and services can be developed. Following the categorisation introduced in the previous section, strategies targeting VIS presence for a given product or service are those aiming to increase its visibility and improve its perception through Internet-based marketing or advertising initiatives. Strategies targeting VCS presence are those aiming at the same objectives but through a systematic analysis of, and intervention in, the development of Internet-based virtual communities in which economic agents communicate about a given product or service and its competitive environment. Strategies targeting VDS presence are those aiming to reduce the cost, or

improve the quality of a given product or service, by distributing it totally or partially via the Internet, or by distributing related, auxiliary, Internet-related services, increasing the attractiveness of the original product or service. Finally, strategies targeting VTS presence are those aiming at the same objectives by exploiting the Internet for product/service-related transactions of different types, such as customer payments or supplier invoicing.

Recognising these four different dimensions of Internet-enabled product or service redesign has the advantage of emphasising the differences between Internet strategies aiming to establish VIS, VCS, VDS or VTS presence. Each type of strategy can be classified in terms of:

1. its suitability for a given type of product or service;
2. the distinct set of competencies necessary to implement it; and
3. the level and type (e.g. front office vs. back office) of organisational adjustments it requires or induces within a company.

In addition, each type of strategy can be combined with others, leading to more sophisticated forms of Internet presence, which might require an advanced level of internal and external coordination.

In terms of products and services for which Internet strategies have been developed over the last 18 months, two different trends can be recognised. On the one hand, providers of digital (or digitisable) products such as software and publications have centred their strategies on VDS presence (see Figure 3). Simple VDS presence

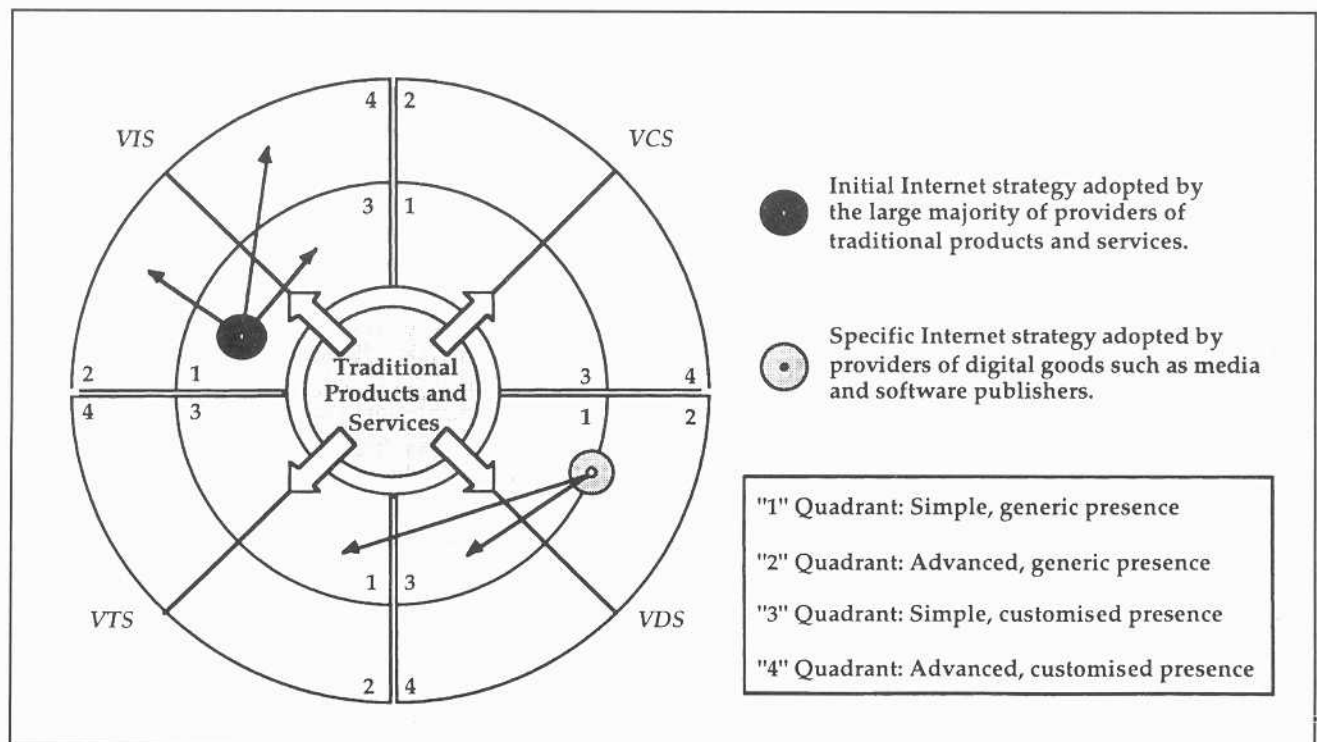


Figure 3 Mapping and Evolution of Internet Strategies

has been established to allow customers to download products or product updates directly via the Internet. More advanced strategies include the provision of auxiliary services such as access to databases of products, Internet-based customer support lines or access to frequently asked questions (FAQ) repositories. First steps towards a complementary VTS presence allow customers to pay directly via the Internet. An example of this approach is the French daily newspaper *La Tribune* (Internet, 1996), which has established VDS presence by providing access to their daily issue (which can be downloaded after 2 pm) as well as to archives (where search is performed interactively through a keywords-based query mechanism). In addition, a partnership with Globe Online (Internet, 1996) guarantees a minimal VIS presence (the company is simply included in a list of providers associated with the mall) and VTS presence (through the secure payment system service provided by Globe Online).

The second trend, which reflects the Internet strategy of the majority of economic agents, has focused on establishing VIS presence in a way which can be characterised as the 'brochure syndrome'. Companies from all sectors have established Internet presence by simply displaying on the Web the information which can be typically found in company brochures. Within the ICDT Model (see Figure 3), this corresponds to a simple, generic and not product- or service-specific VIS presence, the easiest possible type of Internet strategy a company can conceive. Although providing a low-cost opportunity for companies to make their first steps on the Internet, such basic strategies have not been found particularly effective. This fact has stimulated companies to develop, as a next step, more sophisticated types of VIS presence exploiting the specific characteristics of the Internet to include dynamic, interactive elements (to break the one-way communication model which characterises company brochures), or to guarantee a continuous updating and extension of the information provided in order to raise users' interest – with associated word-of-mouth effects – and stimulate repeated visits. Further levels of sophistication and customisation have been achieved through the use of advanced presentation techniques (e.g. a realistically simulated test drive of a car), and the integration of interactive procedures through which potential customers can specify the features of the final product or service they are looking for (e.g. interactively personalised pizzas). Strategies aiming at an even higher level of customisation have been achieved by exploiting the possibility of tracking the addresses from which users connect and of gathering information about how they visit the company's Web site. This information can be used immediately to provide customised information (e.g. by displaying product information in a language or in a form which is most suited to a given user) or can be analysed to design targeted marketing initiatives.

Redesigning existing products and services in the light of the Internet requires companies to acquire new competencies and skills

Competencies' Development and Innovation

Redesigning existing products and services in the light of the Internet requires companies to acquire new competencies and skills, by adopting and extending existing ones or by selecting appropriate subcontractors. The ICDT Model indicates the extent to which such competencies and skills vary depending on the type of Internet presence targeted. As illustrated in Figure 4, very specific issues – besides the more generic ones such as globalisation (Quelch and Klein, 1996; Rennie, 1993) and disintermediation (Rayport and Sviokla, 1995) – have to be considered when designing and implementing presence in each of the four virtual spaces.

Establishing VIS or VCS presence for existing products or services corresponds to an extension of the company's 'front office' operations. Specific issues to be considered include primarily the design of appropriate Web pages (where 'design' is not to be confused with technical implementation), the harmonisation of VIS presence with the current marketing mix and PR strategy of the company, and the study of emerging regulations for direct marketing via the Internet. In addition, establishing VCS presence requires training of company employees in effectively using the Internet as a communication medium, entertaining 'electronic' relationships with customers, up to designing and managing communication spaces created by the company.

On the other hand, strategies aiming at VDS or VTS presence affect more directly the company's 'back office' operations. Key issues to be considered here are of a different nature. They include the analysis of the effectiveness of existing or alternative distribution channels, the avoidance of cannibalisation or unwanted substitution effects, technical consideration related to the quality of Internet-based distribution and security issues, as well as legal (e.g. copyright-related) and trade regulations.

The ICDT Model indicates how the development of advanced Internet strategies involving a combination of different types of Internet presence require the company to acquire very specific competencies, and plan for organisational adjustments affecting both front-office and back-office personnel, requiring a higher level of coordination. In addition, the competencies acquired by experimenting with the redesign of existing products and services can lead the company into the development of a new generation of purely Internet-based services which might or might not be related to the nature of the original services. For instance, a company having developed a successful way of marketing on the Web, or a way of distributing digital products or managing Internet-based transactions, might start offering the same

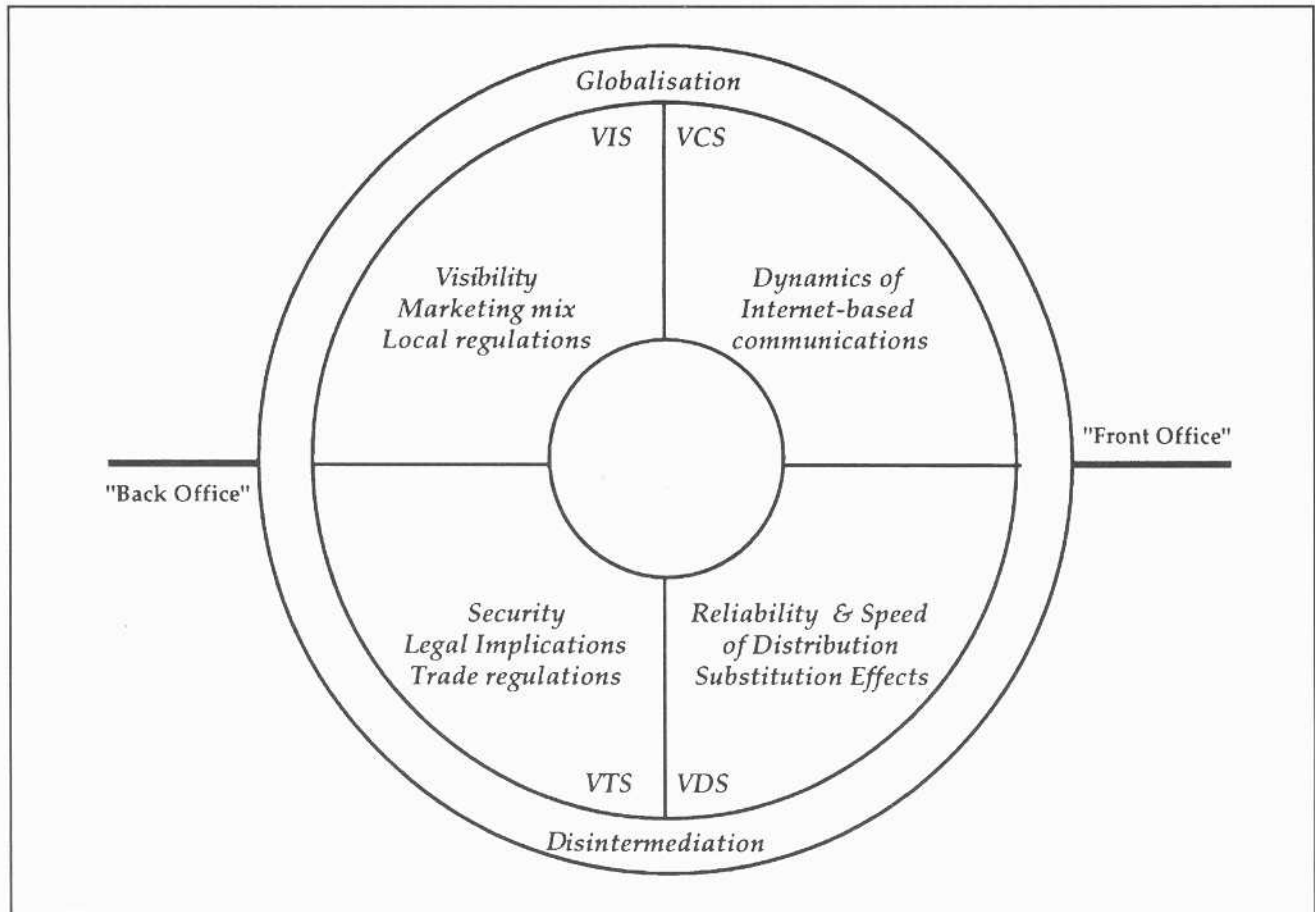


Figure 4 Types of Generic and specific Issues/Competencies

possibilities to other companies, becoming their market channel or their information, communication, distribution or transaction processing partner.

Examples of such developments, in which companies leverage their IT-related competencies to launch new ventures, re-engineer business processes and relationships, or even totally transform their business scope and network transcending traditional organisational boundaries, have been documented in the literature (Konsynski, 1993; Malone and Rockart, 1991; McFarlan, 1984; Scott Morton, 1991; Venkatraman, 1994). For instance, existing telecommunication platforms such as the French Minitel have allowed companies to leverage the competencies acquired by establishing Minitel presence for their own products to introduce new, profitable, Minitel-based business-to-business electronic platforms offering on-line access to a wide range of products and services (Cats-Baril and Jelassi, 1994). Such electronic platforms are starting to be developed on the Internet, and more specifically in each one of the four virtual spaces.

As illustrated in Figure 5, the emerging generation of purely Internet-based services can be classified, using the ICDT Model, depending on the specific virtual space they address. In fact, the nature of many of these new services is to extend the infrastructure of each virtual

space, making it easier for economic agents to establish Internet presence through partnerships which currently take the form of virtual shopping malls that providers can join to increase their VIS presence (Jones and Navin-Chandra, 1995), information location or navigation services like Yahoo! (Internet, 1996) that consumers can use to locate and compare market information, Internet-based on-line marketing and market research agencies, agent-based or groupware-based platforms supporting the creation and maintenance of virtual communities, and discussion groups such as FireFly or Webforum (Internet, 1996), as well as distribution and transaction-focused services of a generic nature, such as the electronic payment platform introduced by First Virtual (Borenstein, 1996), or specific ones such as the transaction-based services provided by emerging Internet-based trading companies like E*Trade (Internet, 1996). These new services, whether introduced by entrepreneurs or by established companies, are contributing to gradually transform the four VIS, VCS, VDS and VTS virtual spaces into efficient extensions of the traditional market space.

Conclusions

The ICDT Model illustrated in this paper provides a framework for the analysis of business-related Internet

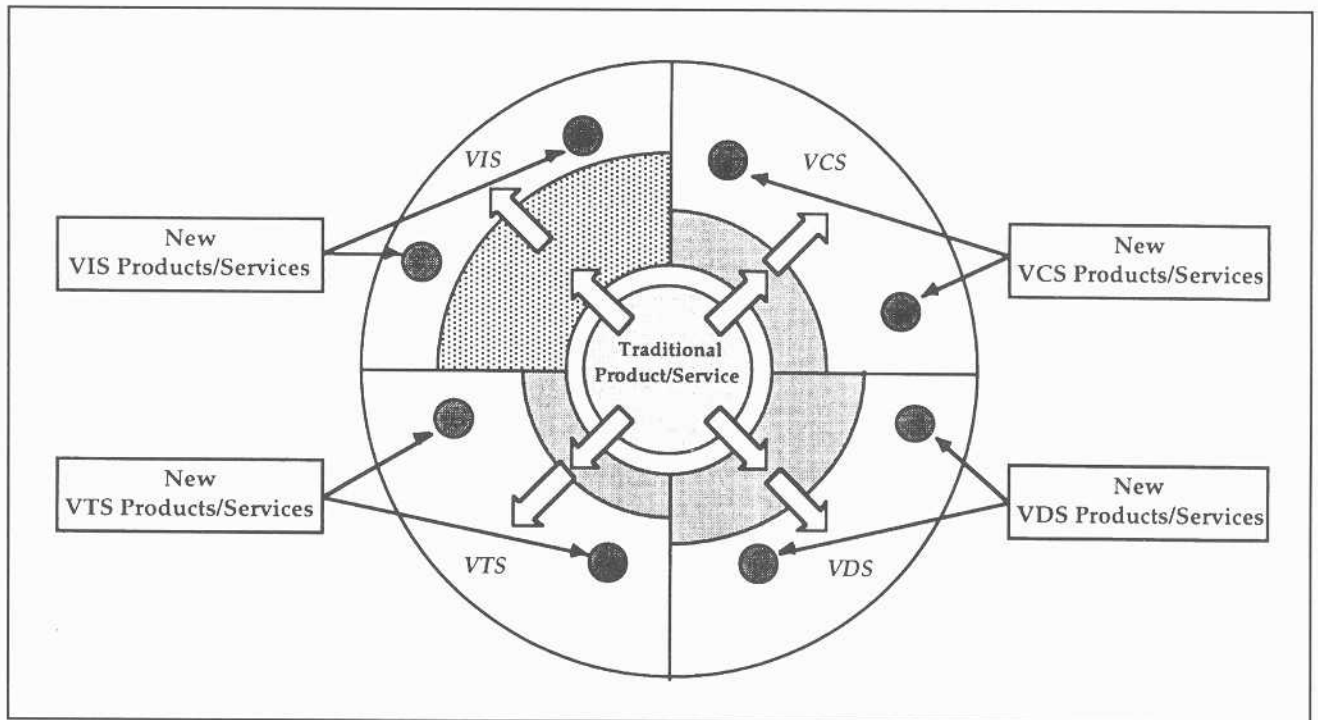


Figure 5 The New Generation of Internet-based Services

strategies, as well as a systematic approach to guide the strategy-building process of companies aiming at redesigning or innovating their products and services in the light of the new opportunities and competitive pressures generated by the spread of the Internet. In addition, the model captures and extends the analysis of current trends such as the 'Information-to-Transaction' approach adopted by large companies aiming primarily at VIS and VCS presence, as well as the 'Transaction-to-Information' approach adopted by new entrants, whose strategy is oriented towards new products and services exploiting the Internet as an alternative distribution or transaction channel. The ICDT Model also indicates explicitly the emergence of a new, potentially important market space, the Virtual Communication Space (VCS). Conducting further research in this specific domain and studying how companies establish increasingly sophisticated VCS presence will help us to better understand how this new low-cost and high-quality medium will enable economic agents (from individuals to companies, communities and institutions) to exchange ideas, express opinions, share experiences and influence markets on a global scale, and how they will contribute in shaping future competitive environments.

References

- Angehrn, A.A. and Meyer, J.F. (1997) Internet Strategies: Insights from the Banking Sector. Forthcoming in *Information Systems Management*.
- Armstrong, A. and Hagel, III, J. (1996) The real value of on-line communities. *Harvard Business Review*, May-June.
- Borenstein, N.S. (1996) Perils and pitfalls of practical cybercommerce. *Communications of the ACM* 39(6), June.
- Burnellis, B. (1995) Internet's phenomenal growth is mirrored in startling statistics. *Internet World* 6, November.
- Cats-Baril, W.L. and Jelassi, T. (1994) The French videotext system Minitel: A successful implementation of a national technology infrastructure. *MIS Quarterly* 18(1), March.
- Cockburn, C. and Wilson, T.D. (1996) Business use of the World Wide Web. *International Journal of Information Management* 16(2), December, J. (1996) Units of analysis for Internet communication. *Journal of Communication* 46(1), Winter.
- Gordon, R.L. (1995) Using the Internet as a business tool: An overview of current opportunities. *Spectrum* January.
- Gow, K. (1996) Intranets vs. notes. *Computerworld* February 5.
- Halfhill, T.R. (1996) Agents and avatars. *Byte* February.
- Hoover, A. (1995) Securing the enterprise. *Internet World* February.
- Ian, A. (1994) Bringing virtual worlds to life. *AI Expert* May.
- Internet (1996): WWW sites mentioned in the paper: (Security First Network Bank: www.sfnb.com); (*La Tribune*: www.globeonline.com/en/CC/FGO6a.html); (Globe Online: www.globeonline.com); (Yahoo!: www.yahoo.com); (FireFly: www.ffly.net); (Webforum: webforum.research.digital.com); (E*Trade: www.etrade.com).
- Jones, D.H. and Navin-Chandra, D. (1995) IndustryNet: A model for commerce on the World Wide Web. *IEEE Expert* October.
- Konsynski, B.R. (1993) Strategic control in the extended enterprise. *IBM Systems Journal* 32(1).
- Loeffler, C.R. (1993) Distributed virtual reality: Applications for education, entertainment and industry. *Virtual Reality World* 1(2).
- Malone, T. and Rockart, J.F. (1991) Computers, networks and the corporation. *Scientific American* September.
- McFarlan, W. (1984) Information technology changes the way you compete. *Harvard Business Review* May-June.
- Minio, R. (1994) Business and the Internet: Some interesting experiments. *Management and Technology* 2(1).
- Pitkow, J.E. and Kehoe, C.M. (1996) Emerging trends in the WWW user population. *Communications of the ACM* 39(6), June.
- Press, L. (1994) Commercialization of the Internet. *Communications of the ACM* 37(11), November.
- Quelch, J.A. and Klein, L.R. (1996) The Internet and international marketing. *Sloan Management Review* Spring.

- Rayport, J.F. and Sviokla, J.J. (1994) Managing in the marketspace. *Harvard Business Review* November–December.
- Rayport, J.F. and Sviokla, J.J. (1995) Exploiting the virtual value chain. *Harvard Business Review* November–December.
- Rennie, M.W. (1993) Global competitiveness: Born global. *McKinsey Quarterly* September.
- Sarkar, M.B., Butler, B. and Steinfeld, C. (1995) Intermediaries and Cybermediaries: A continuing role for mediating players in the electronic marketplace. *Proceedings of the Conference on Telecommunications and Information Markets* October.
- Scott Morton, M. (1991) *The Corporation in the 1990s: Information Technology and Organizational Transformation*. Oxford University Press, Oxford.
- Venkatraman, N. (1994) IT-enabled business transformation: From automation to business scope redefinition. *Sloan Management Review* Winter.



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