

**Emerging Electronic Markets:
Economic, Social, Technical,
Policy and Management Issues**

Stefan Klein, Howard Williams (eds.)

Bericht-Nr.: IM HSG/CCEM/23

Version: 1.0

Datum: 1.3.96

**Hochschule St. Gallen für
Wirtschafts-, Rechts- und
Sozialwissenschaften**

Institut für Wirtschaftsinformatik

Dufourstrasse 50

CH-9000 St. Gallen

Tel. +41 71 224 2297

Fax +41 71 224 2771

Direktion:

Prof. Dr. A. Back

Prof. Dr. H. Österle (geschäftsführend)

Prof. Dr. B. Schmid

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Emerging Electronic Markets: Economic, Social, Technical, Policy and Management Issues

Introduction

Stefan Klein and Howard Williams

The Department of Management Science, University of Strathclyde and the Institute for Information Management, University of St. Gallen organised a symposium at Ross Priory, Scotland to bring together researchers from various European countries to discuss current issues in the development of electronic markets as well as future perspectives and areas research.

The aim of the workshop was to develop an understanding of electronic markets from different economic and social perspectives and to identify antecedents, enablers and constraints for the evolution of electronic markets. From a technical perspective the concern was to understand the way standards facilitate the diffusion and adoption of electronic markets. Managerial issues focussed on the strategic rationale of coordination decisions: why are hierarchical configurations, networks or market transactions chosen and how are they combined.

Beat Schmid, University of St. Gallen, started with a visionary statement about the future of electronic markets. By using the analogy of the development of traditional infrastructures, he argued that electronic markets will provide a decentralised, federalistic infrastructure for electronic commerce, comparable to a system of streets rather than railroads. With only limited regulations a huge number of pluralistic, interrelated forms of commerce will develop, business and consumer markets will be able to use similar platforms. The development of major new infrastructures poses significant difficulties in forecasting the speed and impact of diffusion. Therefore, analytic research has to be complemented with prospective and even constructive elements. In his paper, Beat Schmid sketches the structure and possible impact of electronic markets with a particular focus on the Swiss economy.

After this outline of possible developments, *Juliet Webster*, University of East London, questioned the move to the market hypothesis as well as the forecast that EDI will foster cooperative interorganisational relationships. Using empirical evidence from Ford Europe, she showed that electronic linkages can be used and are used to strengthen and reinforce existing dependencies and power relations.

Chris Holland, Manchester Business School, pursued this argument further and emphasised the coordination strategy of companies as a key to understanding the impact of IT on industrial organisation. Based on evidence from business markets he put forward the mixed mode proposition which says that companies build interorganisational arrangements that combine different governance forms. Hierarchical and market-like coordination tactics complement each

other and combinations of both are designed to benefit from the advantages of close cooperation and reduce dependency at the same time.

Karsten Kärcher, University of Strathclyde, presented a thorough analysis of the European tour operator market and two current trends: on the one hand, the degree of concentration and integration within the value system of the sector is increasing while, on the other hand, small suppliers are engaged in different forms of cooperative arrangements in order to counter the pressure of large suppliers and to gain economies of scale.

Kai Reimers, Bremen University, emphasised the institutional and regulatory pre-conditions for the emergence of electronic markets. He specified rules with respect to products, partners and contracts that are a prerequisite for electronic markets and scrutinised potential benefits for economic actors that invest into development of new institutional regimes.

This mainly institutional line of argument was further pursued by *Hans Niggel*, Ludwig-Maximilian University of Munich, who focused on the development of standards, in particular the role of EDI standard play as a precursor to the development of electronic markets.

Roger Bons, Erasmus University, is involved in the development of Open EDI, an ISO initiative that aims to reduce the complexity in the development of interchange agreements. The intention is to focus on the pragmatics of EDI through conceptualising a level of transactions which is capable of representing different business transactions. He presented a Petri-net based CASE tool that is used for the modelling and analysis of interorganisational transactions.

Stefan Klein, University of St. Gallen, presented a framework for a coordination strategy that emphasised the embeddedness of coordination decisions in structural, relational and resource-oriented contingencies and depicted a rich set of configuration options in terms of positioning within markets and networks, combining different coordination forms and designing multiplex interorganisational relations.

Based on case studies of interorganisational systems (IOS), *Angèle Cavaye*, Technical University Delft, extended the concept of user participation that has been mainly used in the context of internal systems and discussed different ways of involving (potential) users of electronic markets. The hypothesis is that participation can improve the functionality, user friendliness and ease of implementation. However, the participants and the modes of participation have to be selected and combined depending on the respective needs of the project.

Perspectives

During intense discussions over two days, a number of voids and areas of future research became apparent:

1. There is an obvious deficit of methodological discussion in the area of IOS research issues. While case studies are crucial to understand and reconstruct current organisational forms, it remains unclear whether they are sufficient to give a valid forecast for the development of new market forms given the volatile and innovative context we are facing at present.
2. Further conceptual work is required, particularly with regard to coordination forms, coordination mechanisms, different forms of transactions, and layers of institutional arrangements.
3. The distinction between consumer and business markets appears to be important. However, this distinction raises numerous new questions; how will changes in consumer markets affect the structure of the provision of services and the structure of production, what are the interdependencies between the two markets?
4. Finally, the topic of the emergence of electronic markets raises the question to what degree this process can be interpreted as a path-dependent development from the introduction of EDI to electronic markets, and to what degree we will rather see the development of revolutionary infrastructures which use existing standards but emerge faster than the traditional standardisation processes.

The previously unpublished papers presented at Ross Priory - some of them in a revised version - are included in this volume of the working papers series of the Institute for Information Management of the University of St. Gallen.

The Development of Electronic Markets - A Swiss Perspective

Beat Schmid

Introduction

At present, we are passing from an industrial society into an information society. This transition can be compared with the transformation of the agricultural society into the industrial society, 150 years ago. Characteristic for the industrial society are its mechanical technology, and it was essentially stimulated through infrastructures like railway, highway systems and power supply networks (electricity, gas, oil).

Significant for the information society is the global, ubiquitous form of information, i.e. the same information is available simultaneously everywhere, for anybody, at any time. This form of information has become already familiar through telecommunication, in the shape of media like broadcasting, television, telex and telefax - nowadays we are constantly surrounded by dozens of television channels, by hundreds of broadcasting programmes and a multitude of other wireless messages. By telephone, we reach every other participant at potentially every location on earth.

Into this familiar infrastructure, which has transformed our century, the computer as a new kind of information carrier is intruding. Until that, the only *interactive* information carrier was man himself: He can answer questions referring to his knowledge, he can apply information to solve specific problems. Common, passive information carriers as print media cannot effect this. But information technology for the first time realises an artificial interactive information carrier.

This new type of information carrier has begun to merge with the digital audio/video technique and with the digital telecommunication and thus supplies the information society with a new infrastructure: By the merging of information technology with telecommunication, the computerised interactive information carrier gets locationless, ubiquitous; and by merging it with the audio/video technique, it becomes a highly efficient multimedia. We get data objects which can be downloaded from the ether just like television programmes, from anybody, simultaneously, from everywhere. As a very special case we get virtual environments, i.e. information objects we can enter literally.

To load down these information objects from the ether, we need a personal computer. In future this will be an enriched PC, portable, integrating mobile phone and television receiver. Mature forms of head mounted display may be an add on to these receivers. At home, it probably will be a sort of action centre, connecting television with surround sound, simulator devices and further interfaces, to transmit the power of these information objects more effectively.

The ether, where these interactive ubiquitous multimedia information objects exist has been called information highway. Internet is its first realisation. The information highway connects millions of computers, which serve as transmitters and as receivers as well, and should be compared to a sphere rather than to a highway system: Streets lead to a number of defined places, while Internet connects virtually all places, with virtually distance independent costs.

This infrastructure, that we may compare to the railway, highway and energy networks which induced the industrial age, is presently constructed with an astonishing speed. It will change firms and enterprises, has begun to change them already. We now witness a switch on-effect, meaning the unfolding of a new potential, which typically starts with an exponential increase and tends to a saturation point. In the industrial age we had a switch on-effect when an area was disclosed with railroad for industrialisation which, as a rule of thumb, led to a tenfold increment of gross national production. Presently we see this e.g. in the Southeast Asian countries.

Besides this switch on-effect of industrialisation, which here started 150 years ago and now takes place in other, highly populated countries of the world, the infrastructures of the information society have started another switch on-effect. We see the effects of this already in many fields, e.g. in financial markets where, in the meantime, we reached a global market system wherein the financial information are available everywhere and at any time. There, business has changed massively and new derivative products have emerged. We see similar developments in aviation, where the prices were heavily affected because the clients could compare the offers world-wide by using the new infrastructures. We see these effects in computer industry, where presently a dramatic transformation takes place, as in many other sectors.

These new information infrastructures have literally annulled distances, because the interactive information objects look just the same on all the monitors around the world, and they can be handled just the same from everywhere, no matter if the enterprise which offers is located around the corner or on the other side of our planet. This causes a new spatial distribution of economic activities. It frees the management from location, and forces them at the same time to focus on locational decisions, in order to allocate the economic activities in a place where the best conditions are found. For the industrial countries the effect, presently, is an outflow of labour which probably just starts and will cause some rumination in the next decade.

Networking of computers started first inside firms. Then international enterprises began to network their parts, then their networks were interconnected. The genesis of this new infrastructure is about 15-20 years ago. At that time, international firms started to exchange data electronically (EDI, i.e. Electronic Data Interchange). The next step was the introduction of EDI Clearing Centres which linked the networks of different firms, thus becoming true turntables for machine readable information.

During these changes we had to learn to reconstruct the business, even to reinvent it. In production, this process is evident for years: CIM, Lean Production, Simultaneous Engineering are the cues. Within the services sector, the reconstruction process has just started with Business Process Redesign and Business Re-engineering.

The Clearing Centres, originally just infrastructures for information logistics, developed to *electronic markets*. Electronic markets are global, ubiquitous infrastructures, bringing together a large number of sellers and buyers and establishing an equilibrium price through comparison of costs and conditions world-wide. They allow, on the other hand, the configuration of new product and service bundles, e.g. through the linking of services. Electronic markets are the strongest motors of the globalisation of markets and of the global distribution of economic activities.

These now widely used infrastructures could be compared with the railroad system: They are a sort of extension of the hierarchically structured management information systems (MIS) of the

firm, they are planned and managed in a hierarchical way and restricted for a definite number of users. They thus offer a considerable amount of security. In the meantime, with Internet a new type of information network has come into existence, which could be compared with the road system: Networks of this type consist of nets of networks whose collaboration is not ruled by a central management, but through a set of protocols which resemble the traffic rules in road networks and where no central management is found. Still, the more or less uniform traffic rules and services (gas stations and so on) allow traffic over borders of countries and continents.

The characteristic of such open networks is their significantly higher creativity in comparison to the hierarchical systems, where every new idea must pass a more or less cumbersome admission procedure. The resulting growth rate is 50 - 100 % p.a. The number of hosts in the Internet, i.e. of computers serving as information provider, has reached about 6 millions in the middle of 1995 and expands with a rate of about 100% p.a. Thus, the growth rate of the information age is about ten times higher than the growth rate of the industrial age. Internet is a first realisation of the Information Highway, i.e. of an open infrastructure of the information society, containing millions of information objects which can be loaded down by PCs. This artificial biotope grows enormously, at the moment with far more than 100% p.a.

We therefore are confronted with an enormous cognitive challenge: We have to learn to handle a new type of machine (namely ubiquitous interactive information objects) and accordingly to design business in a new way. This is not easy. We still are rooted in the industrial society and might be compared to agrarians, trying to understand industrial society in the early founding age. We will have to learn how to design business in this new surroundings. But this will not be sufficient, because the networks and the subsequent emerging electronic markets lead to a new global distribution of labour.

Therefore we have to *create new jobs*. This is possible in the new open networks. They admit the design and production of the described interactive information objects. This is a field, in which high value increase is possible. Naturally, the portfolio of the products will look quite differently: We probably will see much more entertainment, infotainment etc.

Today we count several 10 millions users of Internet. If their number increases according to the named growth rates, in 10 years they will reach the number of several 100 millions - which complies with a market of the size of the EU or NAFTA area. The potential for this growth is at hand: the PC has become part of consumer electronics. Today, countries like the US count more than 25% households having PCs. Additionally, we have more than a half billion telephone connections and about 2 billion television sets world-wide. Video equipment, video cameras, CD players and so on show the velocity with which consumer electronics are diffused.

What are the consequences? However the solutions may be: They primarily have to be designed considering the growth rate; not the best solution, but the fastest growing solution will be the winner. We need structures admitting the highest possible creativity.

Electronic Markets - A Definition

Economic theory distinguishes two extreme types of co-ordination mechanisms: *Hierarchies* on the one side, and *markets* on the other side. The characteristic feature of hierarchies is their pyramid shape with the right of disposal at the top. Internal relations are ruled by

organisational structure, and process organisation. The basic element of the hierarchy is the command within the framework of contractual relations.

While the allocation of resources in a hierarchy - firms and planned economy - is based on planning, the characteristic element of a market is free trade. The trading subjects are not attached to external planning, they select and decide freely, they evaluate the offers according to their individual needs. Thus, the price can become a carrier of information, indicating the collective situation of supply and demand.

According to traditional market theory, markets are defined as economic places of exchange where aggregate demand meet aggregate supply. Markets serve to allocate resources, skills and products by way of co-ordinating economic activities through competition. Pertinent information is contained in the prices quoted for the products or services generated. Markets in an equilibrium produce optimal allocations. Perhaps even more important: in a dynamically changing environment they support the selection of superior solutions, i.e. the survival of the fittest.

Traditional market theory, however, tends to oversimplify matters. It's assumptions include perfect market transparency, complete information and perfect competition - conditions that are unanimously regarded as being unrealistic. But, despite of this weakness of the theory, on the level of economies, the market as co-ordination mechanism has proved to be superior. Also on the level of corporations, organisation theory has been considering the classic hierarchy model as inadequate. It was suggested, that hierarchies be completed with more competitive elements. The results are such structures as profit centre organisations, holdings or divisional organisations. The drawback of this is a more complex process of bargaining. Coase has explained the existence of the firm as a result of the lower transaction costs in hierarchies.

In reality, a lot of *mixed forms* may be found, especially co-operations. Co-operations can be defined as long term relationships between autonomous partners. This type of agreement dominates e.g. labour markets. Between firms, a co-operative framework is determined by negotiations with the aim of obtaining mutual advantages. Both parties commit resources to the partnership, thus giving away a part of their autonomy. Co-operations need not be firm alliances. They can also be loose partnerships such as supply guarantees, common R & D, projects or common marketing activities.

The impact of information and communication technology (ICT) on the coordination of business activities is tremendous. This applies to hierarchies, co-operations, and markets, as well as on the borderline between these forms of coordination. E.g., ICT often lowers transaction costs dramatically. Most authors therefore consider ICT as one of the reasons for the growth of markets as means for co-ordination. Thus, in terms of selection and survival, the implementation of superior markets are a necessity.

Now, what makes a market an *electronic market*? It is a very specific use of ICT which literally annuls space, namely the use of interactive, ubiquitous or locationless information objects, mentioned in the introduction. Offers presented in the form of an electronic product catalogue, e.g. in the form of a World Wide Web hypertext in Internet, are available simultaneously and globally. Such an electronic product catalogue is not only ubiquitous, but it is also an interactive object, it allows interaction as: request for more information, conditions, and ordering.

Electronic markets can therefore be defined as market places put into action by means of telematics. They support all faces of transactions (see below). The neo-classical market theory

supposes that all information is open to all market participants, and that the transaction costs are negligible. Electronic markets add substantially to these desiderata's, i.e., they contribute to the realisation of the ideal economic market as an abstract place of exchange, which complete information, where transaction costs do not apply.

Electronic markets are characterised by the following features:

- *Ubiquity*, for electronic markets are open 24 hours every day and for any user having access to the telecommunication network, regardless of his or her location.
- *Easy access to information*, although information asymmetries cannot be avoided completely.
- *Low transaction costs* in all phases of market transactions.

Thus, electronic markets promote coordination of business activities by means of market mechanisms,

- by globalisation of markets,
- by opening markets, offering easier access,
- by superseding other coordination mechanisms, especially hierarchies.

This results in an increase of growth, stronger competition, growing creativity, and in a profound restructuring of economy. Electronic markets are fields of power which are to be analysed, and want to be used. They are not harmless and will destroy a lot of firms which are late.

The Structure of Electronic Markets

The phases of market transactions

Economic processes require goods or services on the input side and produce (modified) goods or services to be marketed on the output side. Markets are a means for the co-ordination of these processes. They allow a set of transactions between the exchanging processes, which are represented by their respective owners, namely the supplier and the buyer. These transactions between the involved parties are constitutive elements of a market.

The aim of a market transaction is a trading agreement between supplier and customer, i.e. a *contract* containing all elements of the exchange process. This contract determines also the following settlement of goods and/or services, and of payment, respectively. In a market transaction, the following *parties* can be distinguished:

- The *supplier* or seller
- The *buyer*, willing to exchange goods and services. Sometimes, especially in financial markets, a party frequently acts both ways, as seller and as buyer.
- In some markets, *intermediaries* like dealers, brokers or market makers perform supporting functions to improve the efficiency of the transaction process.

The *market place* provides the logical location and infrastructure for the interaction of the market actors.

Three *phases* can be distinguished, which are substantial for any process of co-ordination with the help of market mechanisms:

Phase 1: Information gathering

On the input side, *information* on available products and/or services, their specifications, suppliers and delivery terms are required. On the output side, potential customers have to be

identified. In addition, some general information on the market situation, sectorial or technological trends will be useful. This phase *results in a list of potential partners* in the market and their offer and/or demand.

Phase 2: Negotiation

As soon as all information has been evaluated, we can proceed to contact potential transaction partners. Terms and conditions have to be fixed (terms of payment and delivery warranties, additional service, etc.). The *result* of this phase *is a contract*, regulating the rights and duties during settlement of the transaction, and regulating the state after the exchange operation. The legal basis for further transactions may also be established.

Phase 3: Settlement

Now the physical transactions are carried out. This phase may consist of various subtransactions depending on the goods or services handled. In the case of physical goods, the transactions might be packaging, storage, shipping, insurance, customs clearance, etc. During this third phase, derivative transactions such as purchasing forwarding services or insurance, will be initiated. The physical exchange of goods is accompanied by flows of financial transactions and information. The *result* of this phase *are exchanged goods and services*, now owned or consumed by the exchange parties.

The schema of Figure 1 illustrates the sequence of process during a market transaction.

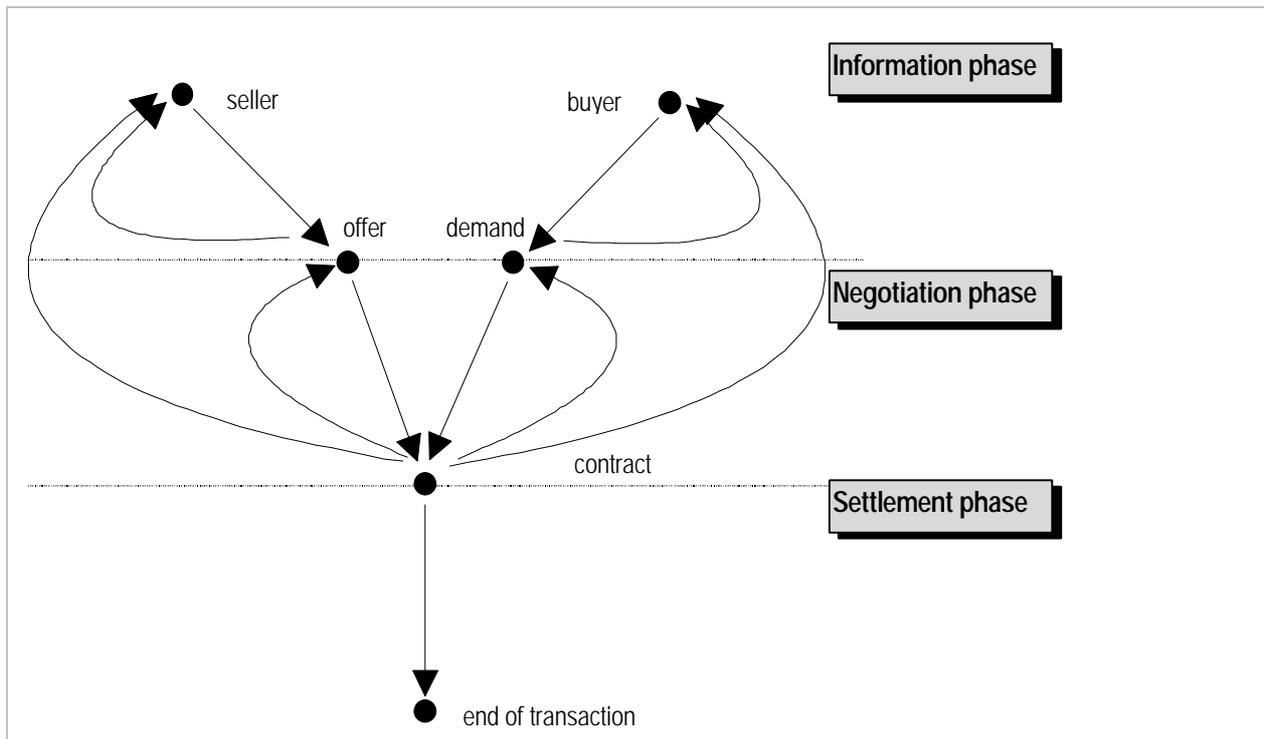


Figure 1: Phases of a market transaction

Electronic Markets are market places realised by a mature form of ICT, as stated above. Its emergence may start with the informatisation of any of the market phases:

- In industry, the transformation of conventional markets into electronic markets most often started with the *settlement phase*. EDI is a key element here. In other sectors electronic

settlement systems have been established as well, e.g. payment systems in retail banking, interbank clearing systems by aid of IOS.

- In financial markets, the electronic form of financial information - delivered real time, world-wide, by suppliers as Reuters, Dow Jones, Knight Ridder and other information dealers - has transformed the *information phase*. Meanwhile, financial markets are global markets, rapidly transforming into fully electronic markets. Other sectors, especially tourism with its global reservation systems, illustrate clearly how the electronic processes disseminate the information of suppliers world-wide, and how an electronic market grows to reality.
- In automated trade execution systems, *electronic auctions* have been established, especially in the field of financial and commodity markets. SOFFEX in Switzerland is one of the successful examples, amongst many others.

Thus we presently see the emergence of electronic market places, driven by the computerisation of one or another phase of market transactions. While the transformation of the contract phase and the settlement phase may be considered as automatization, as seen in industry and administration, the passage from conventional information carriers to the new form of information, namely the interactive ubiquitous information objects, mentioned above, results in a revolutionary transformation: distances shrink to no importance, the customer is in reach of all offers world-wide, in real time (as is a "live" TV broadcasting), and is free to interact with the offers on line. Thus we witness the growth of *the one global electronic marketplace*. Internet, where communication costs do not depend on distances, gives a first appearance of this new marketplace.

Transaction costs for the information phase are by and by reduced to the time needed to scan and evaluate the offers. New services in this field will lower these costs in future, some of them also automated. The concept of intelligent agents for this purpose presently is one of the most vivid areas of research.

A layer model for electronic markets

The electronic market is the logical location for the interaction of the market actors, and provides the infrastructure and services for the transaction.

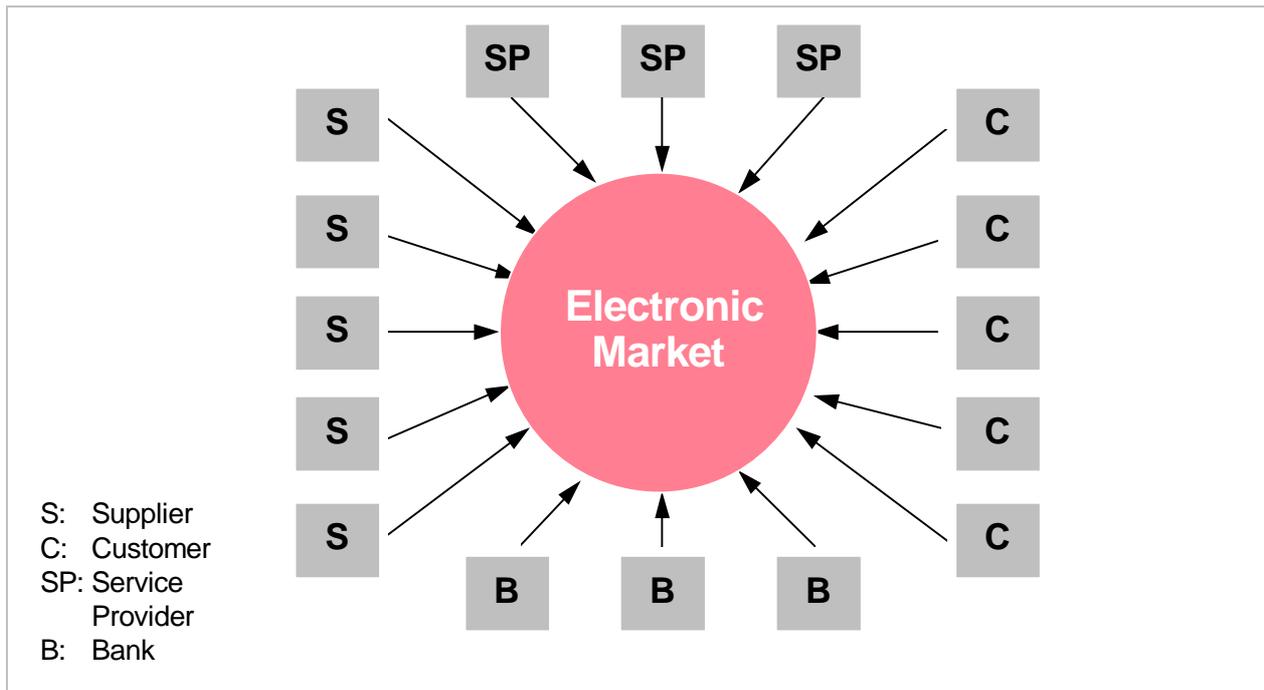


Figure 2: Electronic Markets link multiple customers and suppliers

We do not yet know how the architecture of the electronic marketplace of the future will look like. The following model we propose will be used in the Electronic Mall Bodensee. That architecture is of a very general shape and should apply to a great variety of electronic markets. It follows the philosophy of layered architectures, as they are used in the meantime in all sectors of computer science.

The top layer: a platform for electronic markets

On the top layer we find all electronic markets, accessible by the customer. These markets are defined by several attributes. The most important attribute is the type of the product traded. But other attributes may be also be of interest, as the rating of the suppliers. Such electronic markets may be open for all customers and suppliers, or open for all customers but not for all suppliers, or vice versa, or they may be accessible for a specific group only. Even platforms, limited to a specific company, may be established, for the exchange of goods and services inside the company.

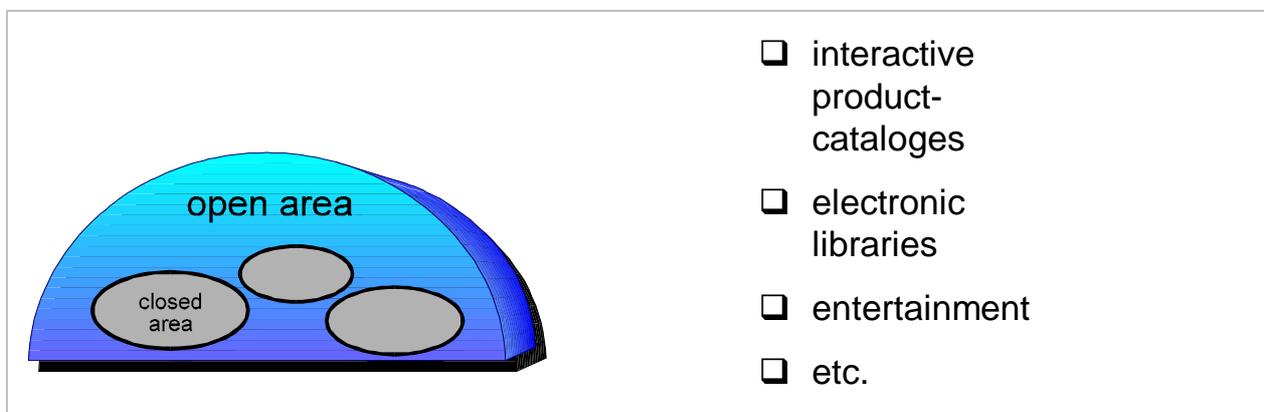


Figure 3: The top layer: Electronic markets

The most important element of the top layer of electronic markets are electronic product catalogues (EPC). They serve to describe the offers of the suppliers. In retail markets they may have a form like the World Wide Web pages accessible in Internet, now in fast growing number, i.e. interactive EPC's with multimedia hypertext structure. Machine readable EPC are a necessity in many business-to-business areas, and will be developed.

The top layer could be structured itself in several layers - we will do this later in 4.5. under one specific aspect - but for the moment we leave it as one layer, comparable to the application layer in the OSI-model for communication of the International Standards Organisation ISO (3).

The layer of generic market services

Whatever the type of business found in the top layer - each of them needs some form of payment services. A large subclass needs logistic services (transportation, customs clearing, marine insurance etc.). Services of this type, needed by large classes of market transactions, may be called *generic market services*.

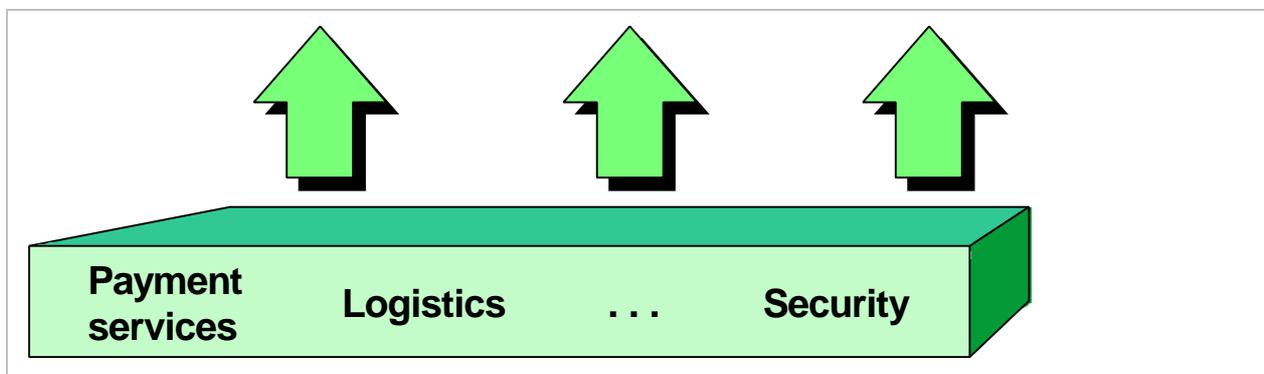


Figure 4: Generic market services

Services of these types are commodities. Electronic markets offering such services as *plug in-solutions* (i.e. as standardised, easily embedable server-objects) will be established, and competition will lead to a dramatic reduction of the prices paid today for these services. International payment services are such an easy to understand example of these commodities on the generic level. Singapore's TradeNet may give an impression of a regional solution for the interaction with governmental offices (customs, taxes and so on).

We now describe a plug in-solution for a *computer integrated logistics* (CIL) in more detail, to give a more precise idea of this layer. CIL may be considered as a platform for electronic coordination in the logistics sector. CIL is an electronic compound document establishing a service, which grants the supplier to exchange a sold good or service with the money paid for it at his door, and grants the customer to exchange the due money with the bought good at his door respectively.

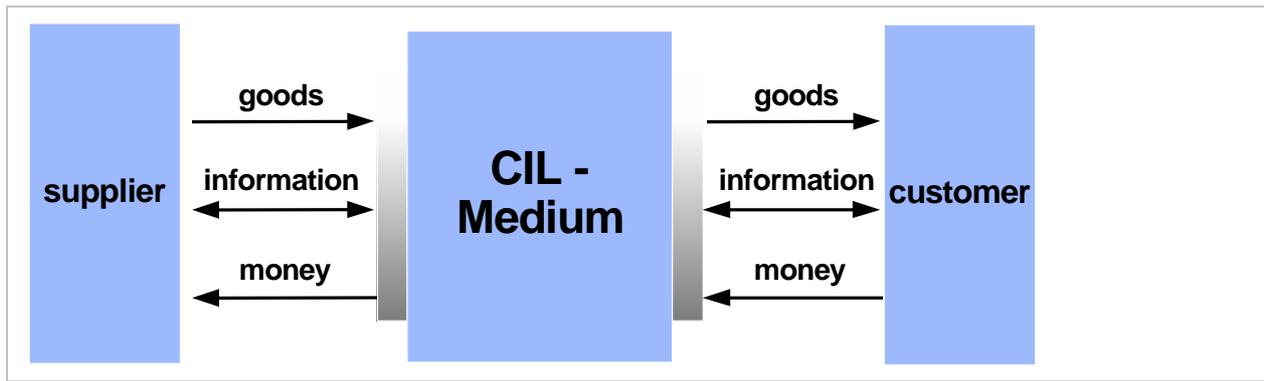


Figure 5: CIL-computer integrated logistics

CIL has been developed together with partner companies in the Competence Centre Electronic Markets at the Institute for Information Management (University of St. Gallen), and is conceptualised as an IS or information logistics platform for the integration of distributed, multi-modal transport services on the one hand and for the integration of financial and administrative (customs, insurance) services on the other. The main function of CIL is the informational representation of the entire logistics chain and processes, covering all phases of business transactions (information, settlement and execution). Within a distributed environment, CIL shall facilitate different co-ordination forms and mechanisms between the various players, e.g. market-like transactions with insurers within a hierarchical relation with a freight forwarder. The application of the research framework in this area exhibits its potential as a design tool.

The CIL reference model is introduced to show how IOS can be designed as platforms to enable a flexible configuration of different governance forms, switching easily from one to another. It encompasses building blocks and tools for the analysis and design of inter-organisational logistics processes. It covers the information and message flow as well as the division of functions between the players in the logistics chain. Particular emphasis has been set on the comparison and configuration of institutional arrangements, such as markets, co-operative solutions or hierarchies. Within different (inter-)organisational settings, the design team has distinguished co-ordination *mechanisms like offer/accept systems*, extended matching or auctions. It has assessed their strengths and weaknesses in terms of allocation efficiency, roles of the participants, different behavioural patterns etc. Figure 8 gives an idea of the rather complex internal structure of such a generic electronic market service. It illustrates the integration of services from numerous different sectors.

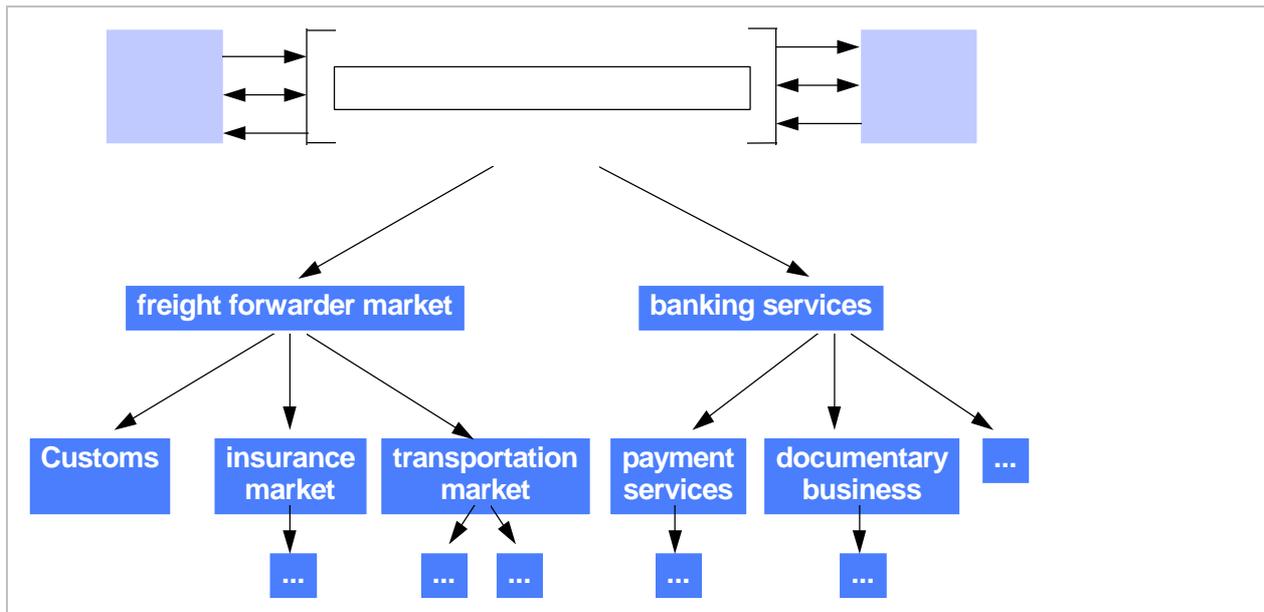


Figure 6: CIL integrates service markets

The generic CIL service may illustrate two points, amongst others:

- As soon as such services are established world-wide and traded as commodities on electronic markets, transaction costs will drop. "Global sourcing" will increase, resulting in further redistribution of labour world-wide, i.e. in an flow of a considerable part of labour away from highly industrialised countries. Such services will contribute massively to a shifting from today's markets towards abstract and ideal places of exchange, imagined and longed for by economy theoreticians.
- Generic services for electronic markets on the other hand are an important field of generating new values, i.e. the creation of new jobs. This is a market for new services, growing with highest growth rates, influencing a considerable part of the gross production of the future world economy. Logistics costs of today's products are comparable with the production costs. So there is a considerable economic force to use cheaper solutions.

The VANS layer: Information highway

The services indicated below level 7 in the OSI-model correspond with standardised services. These mostly are provided by specialised companies, so-called value added network service providers (VANS). The same applies for VANS-services in electronic markets. What is called Information Highway sometimes belongs to this type of standardised service access points.

In today's IOS-solutions, this type of services is offered mostly by VANS-provider. They form a sector with a considerable volume and growth. These infrastructures for electronic commerce are normally closed, centrally managed and secure.

In open networks, Internet-providers and similar services have been established. They are in a very fast growing and competitive market. With World Wide Web, the VANS layer offers a first version of the Information Highway. In the next years we will see the evolution to the Information Superhighway as soon as broad band technology is implemented.

The VANS layer produces its services, using services from the telecom industry, which may be considered as the lowest layer in this model.

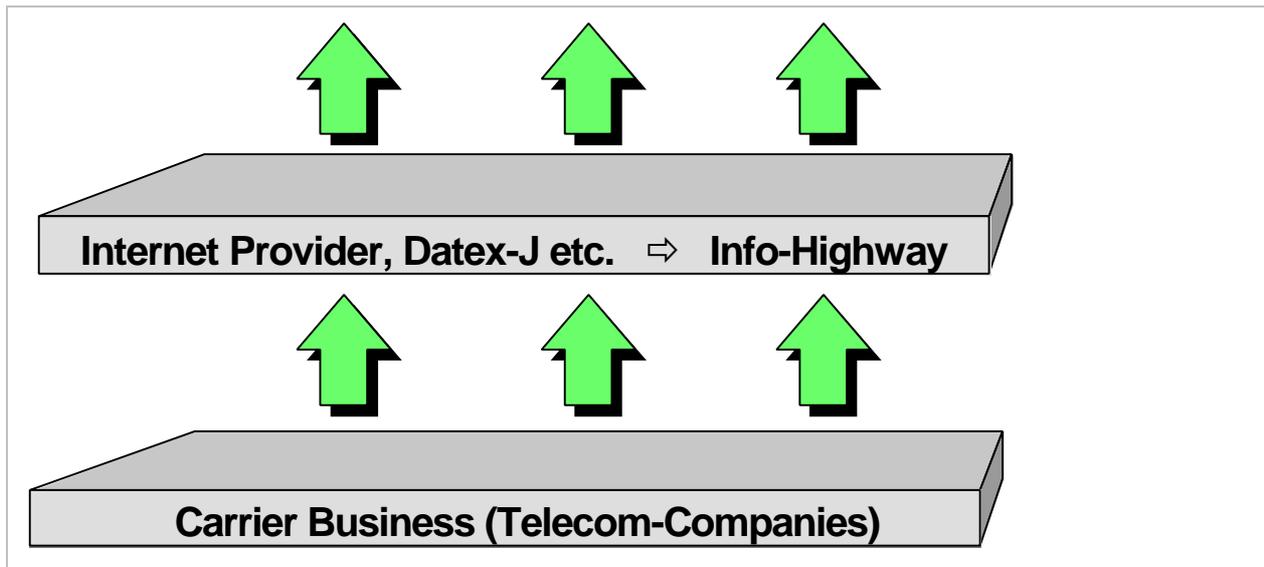


Figure 7: VANS and carrier layer

The carrier layer: Telecom services

The telecom industry presently is in a globally fast changing market, triggered by deregulation on the one side and fast increasing demand on the other side. It is a key enabling technology for electronic markets. Sufficient bandwidth and cheaper prices are expected and will play an important role for the emergence of electronic mass retail markets.

The services of this layer are the same for electronic markets as for many other fields of applications of telecommunication.

The Impact of Electronic Markets

Relations among firms

IOS have changed the way companies are exchanging their goods and services since the eighties. They enable the changes we have seen in the last years in production industry, where now production in global networks is common in different industries, as the automobile industries or in computer industry. But also in service sectors global ICT infrastructure is heavily used, as e.g. in the interbanking business or in tourism.

This infrastructure is now evolving towards electronic markets. The ability of a firm to present its products in these new media, and the ability to make use of the often much cheaper offers available in electronic markets are becoming key success factors. This applies also for small and medium enterprises (SME) and will often be a question of survival.

In the context of these changes, the use of EDI is becoming an important element in the interaction of firms. It is an enabling technology for a successful entrance into the process of transformation. Numerous private and public initiatives give proof for the importance other authorities give this new form of business-to-business communication.

Standardisation

Besides EDI, the emergence of global market places requires standardisation. The PC industry is a good example for the impact of standardisation on growth. Part of this standardisation was the publication of its PC architecture by IBM in the beginning of the '80s. Another part of the

standards we have now in this field are the result of an unplanned evolution. Similar developments may be observed e.g. in the field of financial markets.

It is advantageous to easily understand the type of product, i.e. to have a standardisation, in order to make use of the possibility to order products from everywhere in the world via electronic markets. This lowers transaction costs in the information phase, but has positive effects on other market transaction phases as well. Therefore, standardised products may expect a faster growing market share, as soon as they are available on global electronic markets. But then they will in the end be the survivors of the evolutionary process. This type of selection has taken place in several commodity markets in industry in the past.

Standardisation is a process which may result more or less spontaneously. E.g., in the automobile industry the main devices as brakes, lights etc. eventually got positioned and to be handled in the same way all over the world. Standardisation through an explicitly co-operative act is the superior solution though, proved by many examples, e.g. by the consumer electronic industry. The advantage of co-operative solutions is the reason for United Nations EDIFACT and other initiatives of firms, such as the Object Management Group (OMG).

Electronic product markets.

From the point of view of a specific product or type of service, we will see the emergence of more and more global electronic markets. In fields such as financial markets or several types of products of tourism industry and in other sectors (see part II and III below), electronic product markets have been established and are transforming the related industries. But the process is still in its infancy. In the next one or two decades we will see dramatic changes in most product markets. This applies especially to commodity markets. Moreover, because of standardisation new commodity markets are expected to be replacing older market types.

This transformation process does not only apply to the business-to-business sector. In Internet, we see a fast growing retail market with a growth rate in the magnitude of 100% a year. Here, the establishment of specific product markets is just at the beginning. New types of service providers are emerging, which are going to establish order and orientation in the ocean of offers in this global retail market.

What the consumer wants are market places where he finds exactly the products he needs, and where all existing relevant offers may be found. If the products asked for can be found in several different market places, the customer will prefer the place which best corresponds to the above mentioned requirements. The reason for this are lower transaction costs as well as superior and cheaper business processes. This urges the evolution of the postulated markets.

New products

In electronic markets, along with the offered product, components and services of value for the customer or for service providers, reducing costs, can easily be added. Therefore the trend to complete solutions, consisting of bundles of products and services needed to solve the customer's problem as well as possible, will further increase. Industry is more and more confronted with customers who are not so much interested in buying products, as machines, than in buying services which fit their individual profile as perfect as possible, for a fixed price. So in the world of electronic markets the definition and the concept of a product will change, even in commodity markets. The request goes beyond the bare products, additionally asking for maintenance and a support for the whole life-cycle.

Structure of firms

The global competition put forward by electronic markets forces firms to concentrate on their core-competencies. Survival is only possible in fields where they are competitive in a global scale. This forces companies to abandon all parts where this is not the case, or to outsource them, if their products or services are still needed. In the meantime, the term "global sourcing" stands for outsourcing in a global perspective, as it may be found e.g. in the computer industry. The concentration on core-competencies brings also the distinction between commodity markets and markets for specialised, individual solutions, i.e. we witness transformation of businesses which may be described by the following architecture (Figure 8):

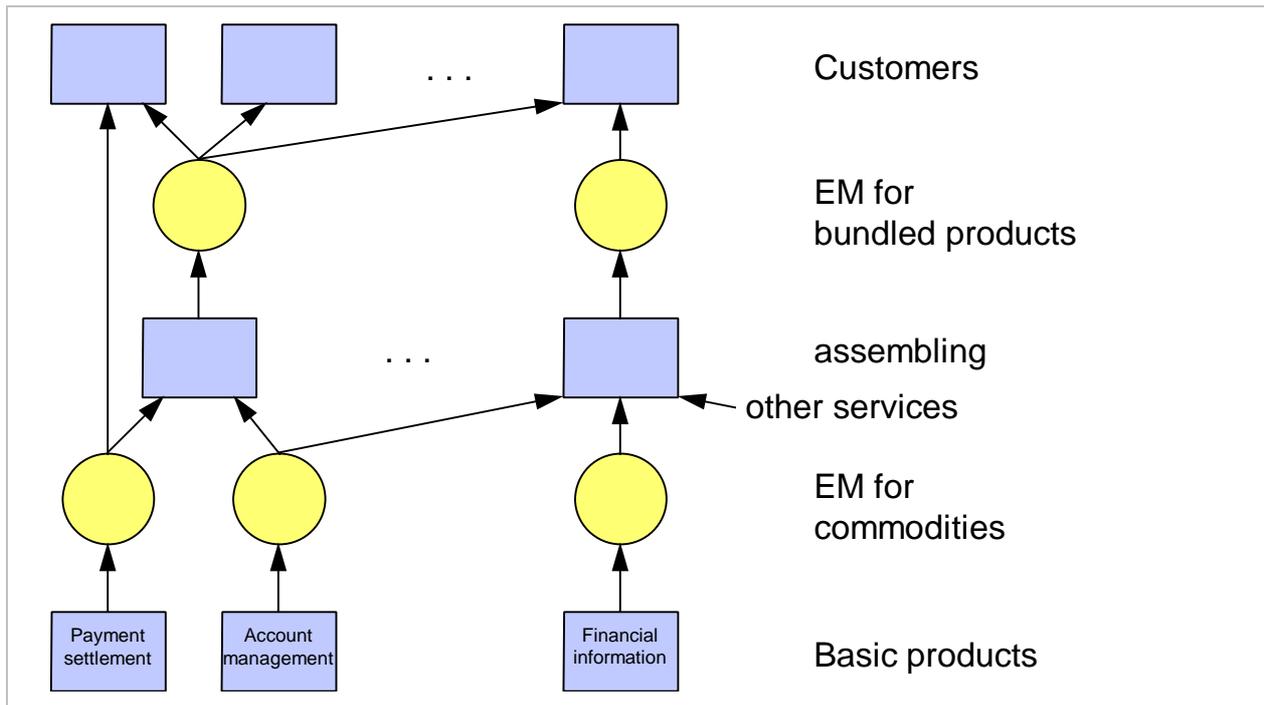


Figure 8: Architecture for business in electronic markets

In the lowest layer of this layered architecture, the production of basic products is taking place. This type of products are commodities as chips, display, screws, payment services, and so on. Such commodities will be dealt with more and more on highly competitive global electronic markets. Survival requires best performance and best prices, which in turn requires production at optimal locations. This type of enterprise has to be fluid and must be able to make best use of all sorts of advantages to improve products and lower costs.

On the other end, i.e. on the top level, the consumer wants to buy the above mentioned complete solution package. He will do that increasingly on electronic markets also. In the meantime, even the end-consumer may enter global retail markets as CompuServe, America Online, or Internet in general. But even if he or she still wants to buy their services in conventional stores, e.g. in a tourist office, these point of sales are ordering the required products more and more on electronic markets.

Between the bottom and the top layer, one or more intermediate layers perform the bundling of the commodities and components to the customers' specific products.

The re-engineering and sometimes the reinvention of the business and enterprises is currently in progress. At the moment, the focus lays on the processes. Tomorrow perhaps it will be more

on structure and markets, i.e. the interfaces between the different parties to allow for a more flexible business architecture and smarter processes.

Virtual enterprise

The enterprise of the future may be the virtual enterprise, i.e. a temporal switching of business units in order to produce a specific product for a certain period, or even for one single customer, as an individual solution. The landscape of the future economy may consist of business units, producing very specific products and services and offering them via electronic product catalogues on electronic markets designed for this type of product. Clients will visit these product markets and eventually contract one of the serving units - similar to a client/server environment.

But different as in client/server systems of present time, the business units functioning as servers will change in number and structure. Market driven evolution will select the fittest enterprises for a specific market. The connection between business units, i.e. between client- and server units, may become shorter and shorter with respect to time. This type of production is presently emerging in several parts of industry. The production of a PC notebook e.g. is performed by the responsible firm in a simultaneous engineering environments, where a number of companies are delivering components such as displays, hard disks, etc., buying themselves commodities from other companies. So a network is formed, containing hundreds of business units, which is in operation for several months, i.e. as long as the product is competitive enough on the notebook market. After that point, the network is dissolved.

But even during its lifetime, the network is not stable. Companies, delivering commodities such as chips, or even companies delivering whole components, may change during the lifetime of a product. Here we may get a flavour of future business architectures. Electronic markets are a medium which stimulates the growth of such forms of production.

Competition between regions

As we have seen, electronic markets force global competition between companies and between firms. This competition forces companies to produce to the lowest costs, and that means: in those regions where the lowest costs can be realised. As consequence, a competition between regions as locations for production is the result. The above mentioned transformation of business requires, on the one side, the presence of the assemblers in the specific markets, in order to be able to understand the specific requirements of the customer. The production of commodities and even complex components of the individualised solution, on the other side, has to take place in the region which allows for cheapest prices. *Glocalisation* is a term sometimes used to describe this phenomenon.

The restructuring of firms we see these days in all sectors and industries provides an opportunity to choose the optimal places for production, R & D etc. The fastest growing economies are found in Asia and Latin America and in the transforming economies of Eastern Europe. In the meantime infrastructure and fairly good education systems are established in large parts of the world, especially in these economies.

So it has become very easy to move activities into other regions of the world, and it will be still easier in the future. Combined with the fact, that the life cycles of production units have become shorter and are still shrinking, this results in a fast increasing percentage of business units which are in search for the best location. So regions have lost their former sovereign

position and find themselves in competition with regions in other continents, as if they were adjacent neighbours.

This process results presently in a cognitive dissonance: While large parts of the population of a region does not yet realise this new situation, managers have sometimes become tired to try to explain this phenomena and begun to weaken their identification with the home region of their firm: They consider regions more and more as commodity-like factors - an attitude which cases already characterizes decisions by private households with respect to their residential location.

Of a special importance for a changing economy are R & D cultures. It takes time to establish such a culture in a specific field, e.g. in biotechnology or in multimedia. More and more firms find it easier to "buy" such cultures where they may be found, instead of developing them in their own region. We can witness this in the pharmaceutical industry, where American gentech companies are bought by European companies, as well as in other sectors. This is rational behaviour, because time has become a most critical factor. We will come back to this aspect in the context of innovative ICT.

Impact on classical sectors

Besides the redistribution of production and other business activities, mentioned in 4.7., new technology has facilitated and still facilitates increasing productivity. While in industry a rate of 10% per year is a typical value, in modern industries as e.g. in PC industry we see a growth of productivity by 50% per year.

This will sooner or later result in similar effects as we know from agriculture, where two hundred years ago about 80% of the population were working, and where today only a small percentage of labour forces produce more than needed. That means, that less and less labour is needed to produce the goods of classical sectors consumed in our region. So we have either to increase exports in these sectors, or to reduce labour - or to become a party and to create jobs in the new sectors.

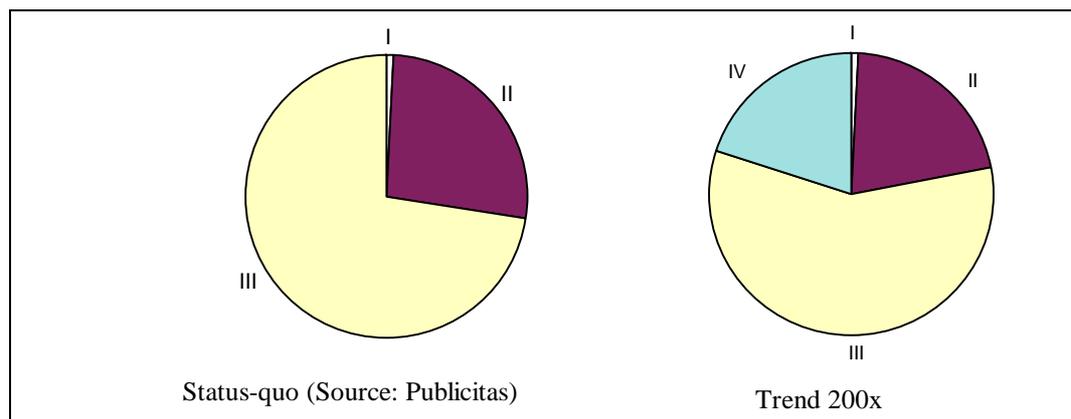


Figure 9: Changing portfolio of the workforce in Switzerland by sectors.

New sectors in the economy of the information society

ICT is a very fast growing new sector. This applies for the lowest level of the above described layered model, i.e. for the telecom business, as well as for VANS. But the most important layers are generic services for electronic markets, electronic markets as platforms for

commerce, and the information objects contained in them. Here, a creation of value is possible which may become a remarkable percentage of the value of the traded goods.

Most important perhaps will become the manufacturing of the new type of information objects. They are the machines of the information society - as productive units, as software packages, as sources for information or entertainment etc. CD-ROM's, computer games, electronic product catalogues functioning as virtual shopping centres, interactive virtual realities for groups of people amongst many other objects, presently are explored and under construction. It is not unrealistic to assume, that in future information society a large part of the gross national production results from this new type of products (see Figure 9 as illustration for this).

Impact on labour markets

Besides the above mentioned redistribution of labour caused by electronic markets, other types of labour markets are expected by experts. The new ICT infrastructure allows markets co-operation over distances. This has become reality in the meantime e.g. in R & D in pharmaceutical industries, or for teams working in financial markets.

In the US the percentage of telecommuters, as teleworkers are called, is expected to grow to 10% in the next years. This type of work allows not only savings for the company. Teleworkers themselves enjoy much more flexibility.

But an even more radical change is on the way: The relation between firm and employee may and will shift from a fix appointment to engagement on the base of a mandate for a specific job, as translating a text, or for a consulting job. Additionally, this type of employee will be found very often on an global market, where specialists from other countries are competitors. An engineer in Poland e.g. costs 10% compared to a German colleague. The more infrastructure and specification for jobs allow for that, the easier a programming job e.g. may be performed by a computer scientist from India as easily as by his Swiss colleague.

This type of effects makes it even more difficult to get a clear picture of the impacts of electronic markets on future economy. Nevertheless, the following assumptions seem plausible:

- economic activities, especially labour, will become redistributed world-wide;
- competition between regions increases and will become very hard;
- this competition will be more often lost by industrialised countries in classical sectors against emerging markets, as this was often the case in the past;
- industrial countries therefore need and should concentrate on the creation of additional net production value in fields, where they have a competitive advantage in a world-wide market, especially in new fields of the emerging economy of the information society.

Conclusions

The world economy is in rapid change, enabled and partly caused by ICT. Electronic markets are the media where enterprises find competitors intruding into their customer relationship and where customers are allowed to abstract from their supplier location. Electronic markets mean for goods and services what electronic media meant for information and entertainment.

In Switzerland, we have a class of enterprises which have witnessed these changes, and a large number of them are managing this transition with success. Especially a number of Swiss international enterprises are re-engineering their business in a direction appropriate to the new markets. They are aware that in the new markets there is a survival only for the best. Also a

number of small and medium enterprises belong to this group. In most cases this re-engineering results not only in an increase of productivity but also in a re-distribution of production in a global framework, in outsourcing of activities in low-price countries, leading to a reduction of labour in Switzerland.

Another group of organisations are (still) of regional character. Besides governmental organisations, monopolistic enterprises, agricultural and other protected sectors, depending more or less on state, belong to this segment. They begin to suffer the shortage of means of the state, a consequence of the poorer growth of the above mentioned first group of enterprises within Switzerland. The therapy is well known and recommended e.g. by OECD: Competition and deregulation. In this group of organisation we may distinguish three types:

- Organisations protected also in future, as government, army, etc.
- Organisations aiming at deregulated global markets and mastering successfully this transformation,
- Others, neither protected by law nor able to manage the necessary changes. Most of them will disappear.

As a third and most important group we see the foundation of new enterprises. But Switzerland is often deplored as a rather poor ground for start-ups, much in the rear of the best areas, as e.g. located in the U.S. We will come back to this later.

In sum, we have to reckon with a further shrinking of labour in the second and third sector of our economy. There must be assumed a rather high probability for this. But nevertheless there is no reason to doubt that Swiss firms producing in the second and third sectors, and mastering successfully the transition, will belong to the most successful enterprises in the next decades, and that production of a large variety of goods and services will have its place in Switzerland, as an impressive number of examples is proving today.

Still we consider as the critical are for the future position of Swiss economy, the value produced in a new, fourth sector, i.e. in the new information business, consisting of ICT, the production of information objects, services related to them, and of business media as electronic markets. The 21st century's economy will show a portfolio different from today's: The second and third sector, dominant today, will loose, and the new information sector will gain considerably in relative share. Therefore, a successful policy requires two elements:

- Hold a good position in the second and third sector, comparable to today's position.
- Gain a position in the new information economy sector, which is at least average among industrialised countries.

The first policy element claims a full exposition of our enterprises to global market forces, immediately, and access to the global market places as well. Deregulation, WTO and similar frameworks are means for this. Besides that, Switzerland has to be a place above the average for the foundation of new enterprises. This also requires excellency in research as well as an innovative and entrepreneurial culture, encouraging the transformation of innovations to products and businesses, and thus being able to compete with the best regions of the world. This is not the case today in a number of fields. Besides that, start ups need favourable conditions in tax law and other types of regulation. In the last years, Swiss economy showed a relatively poor performance in this respect. There are a lot of studies concerning this point.

But we consider the performance in the information sector as the key element for the future position of Swiss economy. While US-economy, having a performance in second and third sector comparable to other highly industrialised countries, has a fast growth in this sector,

Switzerland shows a fast growth of imports for goods and services of this type, and nearly no export. This situation compares to much lower developed countries. While e.g. Singapore and other Asian countries have developed national strategies concerning this sector, Switzerland exhibits a good position only in the telecommunication business - in Europe. Its position is rather weak in the VANS business and of new international importance in the hard- and software industry. Its contribution to electronic markets (e.g. electronic stock exchange, and Galileo), are remarkable. But still, most of services in this field are produced by other nations. In the market of information objects, the position of Swiss economy is of no relevance in a global perspective yet.

Goods and services of this fourth sector are traded in global, mostly electronic, markets. On the other side, for a large part of them, electronic markets are an enabling technology, as Internet demonstrates clearly. Therefore electronic markets are a key technology for the economy of the information age. So it is of great importance not only to use electronic markets as early as possible, but also to have an active role in the design, implementation and operation of electronic markets. Electronic markets are of strategic significance.

To master successfully this transition into the information society, visions are needed, to rouse energies in the young generation, and a policy has to be formulated, relying on an analysis of the own potentials, and of the external world. This allows the identification of success positions as the base for the development of a strategy.

In Swiss economy, this process has to be performed mostly by enterprises. But there are elements left to the state. Among these are: education, policy of governmental agencies, legislation e.g. to allow for the development of one of the most liberal telecom markets in the world or for a liberal and secure place for electronic markets and alike.

Additionally, electronic markets have the character of an infrastructure. As such, they may profit considerably by a coherent and focused policy, bundling governmental activities, as e.g. relevant elements of legislation, educational and research policy, EDI-infrastructure of the public sector, to mention only a few examples. We feel, that the definition of a national policy in this field would not be less important than for other infrastructures as traffic, energy, telecommunication, or electronic media. This, of course, should be only a complementary element to the most important initiatives of the private sector. Besides companies already doing their business in related fields such as VANS, but also in logistics, retail banking and other sectors, where electronic markets are intruding now, several groups of players merit attention:

- *Bank, insurance* et al. The big Swiss firms in the service sector, especially banking and insurance, should define their future role in the field of generic electronic market services. These services could be offered world-wide. Besides price, quality and confidence are most important elements here. Payment services, electronic cash, a variety of insurance products belong to this field.
- *Logistics*. Traffic has played an important role in Swiss economical history. The establishment of a high quality world-wide CIL-service, i.e. another powerful generic electronic market service in logistics, would be a promising field for the production of value. Such a service could integrate, besides private companies, postal service and SBB, as well as Swissair.
- *Security architecture*. In open electronic markets, a variety of security services are needed. Besides the well known services related to cryptography, trusted third parties and trustees'

services, electronic certificates and forms of identifications and many other services, have to be established. They ask for an appropriate law and rules, as we find them e.g. for banking. And they require a coherent architecture to be effective. Then they may attract a share of the emerging electronic markets needs, and contribute to Switzerland's future exports.

- *Government.* As other nations have witnessed for several years (e.g. Singapore, US, EC), the government is a critical player in electronic commerce. At least, two elements should be mentioned here: The use of EDI in the relations between government and its suppliers, and the accessibility of government via electronic interfaces by its customers, in order to pay taxes, perform declarations and receive permissions, electronically. This would not only be a stimulus for the whole economy, but moreover result in an increase of productivity of governmental institutions.
 - *Market architecture.* A key element is the development of a coherent electronic market architecture. A co-operation between firms and public authorities is more than helpful - in order to reach the critical mass in due time - to gain the number of participants needed in an electronic market for profitability and superiority over other solutions. The other critical factor is time. In this respect, too much co-operation might be dangerous. New forms of co-operation have to be developed.
 - *Small and medium enterprises (SME).* For SME, the transformation sometimes seems to be hard to master. Support from outside may be advisable. Appropriate measures should soon be developed and implemented to encourage this extremely important category of firms.
 - *New enterprises.* In the long run, Switzerland's economy will be successful only if there are enough newly founded enterprises. This regards especially the new information sector. The possibilities and activities in this field should be analysed and compared with other areas, and appropriate measures should be developed and implemented - as e.g. an off shore zone for foundations in specific sectors, as recently proposed by Hans Schmid.
- Of special importance here is the content business, i.e. the production of contents for the new media, as electronic product catalogues, multimedia information, edutainment games etc., in short: all sorts of contents contained in the new media, emerging from electronic markets, Internet, TV and other media, as point of convergence.

The intention of this paper was to analyse the phenomenon of electronic markets and to point out their importance for the economy of the future. It has been shown that electronic markets are profoundly changing the economic world, and are an important part of the infrastructure of the information society. To develop appropriate measures to contribute to the gross national product of Swiss economy requires further research. This also applies to the analysis of specific sectors, or education and research in this field. E.g., we still do not offer a major degree in media and communication sciences in our universities. The new media are of great relevance to the subject discussed. We not only witness the convergence of different technologies such as computing, telecommunication, television, etc., but also a merging of information, entertainment, and electronic markets. Internet gives good evidence of that. So, a lot of things should be set about, and a great deal of them are relatively easy to realise. We have a potential, excellent in many, above the average in most areas - and we have no excuse to be behind others:

„One of the great things about this industry is that every decade or so, you get a chance to redefine the playing field. We're in that phase of redefinition right now“. (Lou Gerstner, IBM)

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Industrial Change in the Outgoing Tour Operator Business in Britain and Germany: The Emergence of Electronic Market Systems

Karsten Kärcher and Howard Williams

Abstract

Large, vertically integrated outgoing tour operators dominate the foreign holidays segment of the British and German travel and tourism industry. This industrial structure has emerged and has been sustained by a number of factors, of which the adoption and diffusion of new information and communication technologies (ICTs) is one of the most significant. As a response, some small outgoing tour operators have established cooperations both among themselves and with other travel and tourism companies in an attempt to achieve a degree of parity with the large operators. However, recent developments in computer reservation systems and associated new trading patterns may bring about changes to the travel and tourism industry in general and the outgoing tour operator business in particular. The new trading forms are deriving from the establishment of electronic market systems, for example, as a result of the merging of global airline reservation systems with hotel, car rental and other booking systems. Electronic market systems may well provide new opportunities for some outgoing tour operators as well as threaten the competitive position of others, and, overall, may make it necessary for outgoing tour operators to seek new ways to 'add value' to travel and tourism products.

The economic importance of the travel and tourism industry and the central role of tour operators

The travel and tourism industry has become a sophisticated and complex industry, providing a wide range of products for business, leisure and many other purposes, and encompassing a diverse range of firms and other organisations. In fact, it can be seen as an 'umbrella industry' (Lundberg, 1980, p. 1), comprising a series of interrelated businesses, embracing, amongst others, travel and transportation companies, accommodation and catering enterprises, destination agencies, tour operators, travel agents, and providers of recreation and leisure facilities. Apart from being highly important in a socio-cultural and an environmental context, the travel and tourism industry is of major economic importance to most countries in the world. In 1987, according to one of the most recently published comprehensive reports on the world travel and tourism industry, the industry's contribution to the world economy amounted to nearly US\$ 2 trillion in sales, equivalent to 12% of global GNP (gross national product), 5% of global sales of all goods and services and 15% of global service sector sales. The industry employed 101 million people worldwide, i.e. one in 16 workers (WTO, 1991, p. 3). The industry is also very significant to the economies of Britain and Germany. In 1989, the UK ranked fifth and Germany seventh of all OECD countries regarding international tourist receipts, with the UK receiving US\$ 11.25 billion and Germany receiving US\$ 8.66 billion; while Germany was the second highest spender on international tourism after the USA, with Germans spending US\$ 24.13 billion abroad, and the UK was fourth highest after Japan, with UK citizens spending US\$ 15.20 billion abroad (Devas, 1991, p. 3-5). These figures do not

include domestic expenditure on travel and tourism products which exceeded US\$ 15 billion in each of the two countries in the same year, further underlining the importance of this industry to the economies of Britain and Germany.

Tour operators provide one of the core functions for the leisure sector of the travel and tourism industry. Tour operators, in assembling holiday packages or inclusive tours from a wide range of available components, provide a link between the travel and tourism principals on the one hand and travel agents and consumers on the other. Packaged holidays have become one of the major travel and tourism products. In Germany in 1992, for example, 42% of all holiday trips were packaged (DRV, 1994), and holiday packages were of similar importance in Britain, as illustrated in figures by the Association of British Travel Agents Limited (ABTA). In 1989/90, an estimated 80% to 90% of all travel agents in the UK were members of ABTA and 72% of their average turnover came from the sale of inclusive packages (East, 1990, p. 23). Outgoing tour operators, in contrast to incoming and domestic ones, have gained particular importance in the industry, in terms of both number of trips sold and turnover. In fact, some outgoing tour operators were among the largest players according to turnover and number of customers in the travel and tourism industry in the world and especially in Europe, and of these, the twelve largest in Europe according to turnover were German, British, Swiss and French, as shown in Table 1. Due to the significance of the travel and tourism industry in Germany and Britain and due to the dominance of German and British outgoing tour operator groups and cross-ownership between some of them, as further discussed below (Table 2), only the German and the British outgoing tour operator sectors will be analysed in the following.

1	Tour Operator Group	2	Turnover ³	Customers ⁴
1	Touristik Union International GmbH & Co. KG (TUI)	D	5.05	4.45
2	NUR ⁵ Touristic GmbH	D	3.20	3.00
3	The Thomson Travel Group	GB	2.81	3.30
4	Reisebüro Kuoni AG	CH	2.73	0.70
5	Club Méditerranée	F	2.43	2.13
6	The LTU Group	D	2.29	1.73
7	Owners Abroad Group PLC ⁶	GB	1.55	2.10
8	International Tourist Services Länderreisedienst GmbH KG (ITS)	D	1.55	2.05
9	Nouvelles Frontières	F	1.48	1.45
10	Deutsches Reisebüro GmbH (DER)	D	1.21	1.34
11	Hotelplan	CH	1.12	1.37
12	Airtours PLC	GB	1.12	1.70

¹rank, in decreasing order in terms of turnover in 1992, including that of national and international subsidiaries

²country

³in billion DM in 1992

⁴in million in 1992

⁵Neckermann und Reisen

⁶renamed First Choice Holidays PLC in 1994

Table 1: The twelve leading European outgoing tour operator groups in 1993

Although more than 700 tour operators traded in Britain and a similar number in Germany in 1993, the two sectors were highly concentrated in terms of market share. In 1992/1993, 38 predominantly outgoing tour operators including subsidiaries accounted for an estimated 75% of the German air package market and for between 40% and 50% of the remainder of the package holiday market (FVW International, 1993), while the top 30 predominantly outgoing UK tour operators accounted for about 82% of the UK air package market in 1990 (Key Note Report, 1991, p. 10). The outgoing tour operator sectors were particularly concentrated, with the three largest UK outgoing operators, including subsidiaries, controlling an estimated 62% according to turnover in 1993 (Key Note Report, 1993, pp. 60, 62), and the largest five German outgoing operators including subsidiaries controlling about 70.9% of the largest 38 outgoing tour operators in Germany in 1992/1993 (FVW International, 1993).

It appears that while the dominant outgoing tour operator groups in Britain and Germany have been concentrating on mass markets and on achieving economies of scale, many of the smaller outgoing tour operators have been specialising in and serving niche markets. This, in fact, is not a recent occurrence, but was already noticeable in the mid 1960's (Robinson, 1976, p. 91).

The adoption and diffusion of new information and communication technologies and the emergence of electronic market systems in the travel and tourism industry in general and in the outgoing tour operator business in particular, may, however, have major consequences for the outgoing tour operator business and may change this situation by enabling small outgoing tour operators to enter mass markets and, in turn, encourage large outgoing tour operators to enter niche markets. In addition, the new trading forms may threaten the position of some outgoing tour operators as well as provide new opportunities for others.

The main aim of this paper is to provide an analysis of current industrial changes in the outgoing tour operator business in Britain and Germany, in particular the emergence of electronic market systems, which have so far not been well documented in the literature, and to outline some likely consequences of these new trading forms. While this paper is focused on the outgoing tour operator business, there are obviously similarities with the domestic and incoming sectors of the tour operator business and with the travel and tourism industry in general, which, however, are not elaborated in greater detail.

The significance of new information and communication technologies to the outgoing tour operator business

It has been argued that developments like the construction of railways and telegraph lines were among the main factors contributing to the formation of large production firms in the nineteenth century (Malone *et al.*, 1987). Similarly, modern forms of transport have enabled the rapid and worldwide movement of people, and developments in new information and communication technologies (ICTs) have increased the global exchange of information, with far reaching consequences for most industries in the world. New ICTs, particularly those that support inter-organisational trading activities, have been identified as one of the most significant factors that have supported or have led to major changes in the travel and tourism industry worldwide since the 1960's and 1970's, and are likely to continue to lead to further organisational and industrial alterations (Bennett, 1990; Hinds, 1994; Holloway, 1988; Poon, 1993; Schertler *et al.*, 1994; Tuach, 1990). For example, large American airlines developed internal inventory systems at the end of the 1950's and during the 1960's to streamline the distribution of, and to increase the control over, the sale of airline seats, thus reducing production, distribution and administration costs by increasing operational and managerial efficiency (Lange, 1993).

New ICTs have a number of benefits, which can manifest themselves in a reduction in production costs, an increased efficiency of operations, an improved effectiveness of management and the increased direct competitiveness of a company's business (Ward, 1986). Further indirect benefits, which are significant to a company's internal organisation but especially to its external position, are improved information in terms of quantity, accuracy and integrity, enhanced communication in terms of speed, accuracy and integrity, and, basically as the final goal for any company, an improved competitive position in the industry (Cash and Konsynski, 1985; Malone and Rockart, 1991; McFarlan, 1984; Porter and Millar, 1985).

While these benefits apply to companies in most industries, new ICTs are particularly important to the outgoing tour operator business because of the nature and complexity of its

products. The products 'inclusive foreign tour' or 'packaged foreign holiday' consist of multiple components delivered by a large number of operators, thus creating a need for extensive information exchanges and communication. However, it is not only the fragmentation of packaged holidays that demand this communication and information exchange. Inclusive tours are moreover highly perishable; hotel beds, airline seats and their like have a limited 'shelf-life' since they cannot be stored and are instantly lost if not consumed on a particular day. Although these products can be advertised and sold long in advance, the period immediately before their intended time of consumption is sometimes a decisive factor in the eventual financial success of an outgoing tour operator because of last minute customer demand. Hence, rapid, extensive and reliable information and communication are essential for outgoing tour operators.

The distribution of foreign holidays and a competitive positioning model

Foreign holidays, both as individual components and packaged tours, are distributed or sold to final consumers over different distribution channels. These range from direct sales channels, connecting travel and tourism principals that provide the basic travel and tourism products or components with final consumers, to indirect sales channels via outgoing tour operators as the packagers or wholesalers of foreign holidays and/or travel agents as the distributors, brokers or retailers of the industry (Figure 1).

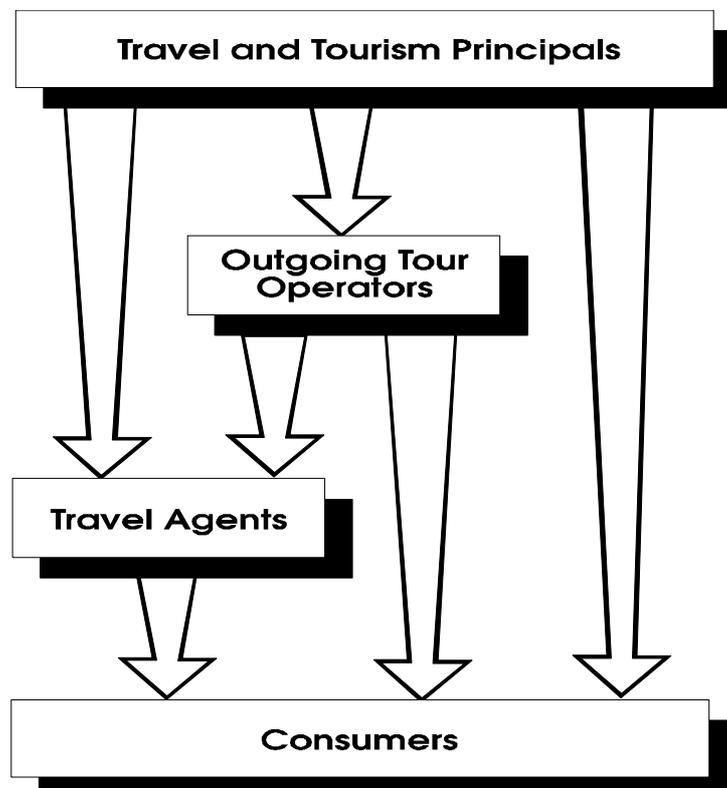


Figure 1: The main distribution channels of foreign holidays (Adapted from Freyer, 1993, p. 131; Renshaw, 1992, pp. 81, 105)

This system of distribution channels can be interpreted as the value system of the foreign holiday sector of the travel and tourism industry, extending Porter's (1985) value system model to a whole industrial sector. The concepts of the value chain, i.e. the sequence of 'value-adding' business processes or units within a single firm, and the value system, i.e. the interlinking of the value chains of a number of individual firms, were developed by Porter (1985, pp. 33 - 61) as tools for diagnosing competitive advantages of firms. These models are based on the idea that a firm or a series of firms, respectively, can be seen to provide a sequence of processes or activities during which value is added to a product, thus basically constituting a production sequence. In this view, the distribution system of foreign holidays can be seen as a value system, consisting of a sequence of activities during which value is added mainly through the provision of information. Although not further described here, it should be noted that a 'continuing' value system exists, namely that in which the actual transportation, accommodation and other components are provided once a foreign holiday has been sold and a consumer embarks on it.

Porter's value chain and value system models are a core part of his previously developed competitive positioning model (1980, pp. 3 - 33). This positioning model serves as a framework for the structural analysis of industries and for the development of strategies to competitively position firms. The model can also be extended to include cooperative and collaborative strategies (Reve, 1990). Porter determines five forces that drive industry competition. These are the competitors in the business, i.e. the outgoing tour operators in the case under discussion here; their suppliers, i.e. travel and tourism principals; their buyers, i.e. travel agents, interpreting the term 'buyer' broadly, and final consumers; potential entrants, i.e. any company from inside and outside the travel and tourism industry wanting to establish an outgoing tour operator business; and substitute products, i.e. any product that might substitute packaged foreign holidays. Each of these five forces poses threats to the individual outgoing tour operator, as outlined in Figure 2.

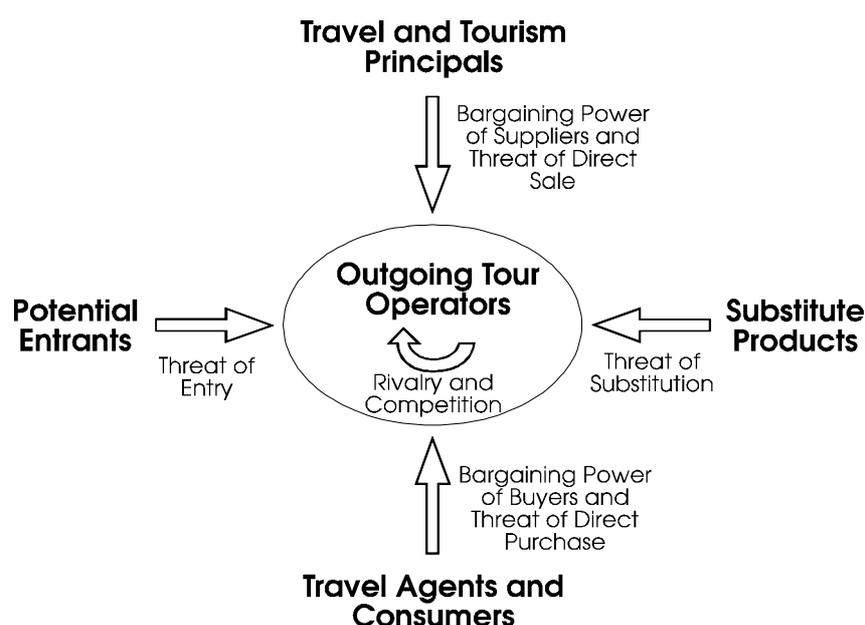


Figure 2: Porter's competitive positioning model in the case of the outgoing tour operator business (Adapted from Porter, 1980, p. 4)

Seen in the context of this framework, new ICTs can strengthen the competitive (or cooperative) position of firms in an industry by reducing, or enabling the companies to reduce, the threats from these five forces. Examples and a brief analysis of the utilisation of new ICTs by outgoing tour operators to achieve improved competitive positions are presented, using Porter's positioning model together with the value system model as the underlying frameworks, while showing that new ICTs were among the most consequential factors in shaping the structure of the outgoing tour operator industry. The information about the outgoing tour operator industry in Britain and Germany is gained from both primary sources through interviews as well as secondary sources.

New ICTs and industrial organisation of the British and German outgoing tour operator business

Hierarchical outgoing tour operator organisations

Some outgoing tour operators have, like major airlines and other travel and tourism companies, realised the potential of new ICTs to strengthen the competitive position of their organisations. The Thomson Travel Group and TUI, possibly two of the strongest and most aggressive promoters and users of new ICTs in the outgoing tour operator business, are prime examples, having become the largest tour operators in their respective countries and two of the largest operators in the world. The Thomson Travel Group and its dominant outgoing tour operator Thomson Holidays Limited (later renamed Thomson Tour Operations Limited) introduced the Thomson Reservation and Administration Control System (TRACS) in 1976, which was incorporated into the Videotex/Viewdata-based reservation system Thomson Open-line Programme (TOP) in 1982 (Holloway, 1988). While TRACS served as an internal inventory system, similar to the early airline reservation systems, to streamline sales, reservations and booking procedures, the TOP system was made available to travel agents to serve as an external reservation and booking system. As a result of its success in gaining acceptability, TOP's use was made mandatory for all travel agents in Britain wanting to make bookings with Thomson Holidays in 1987.

TUI was one of the founders of the Studiengesellschaft zur Automatisierung von Reise und Touristik (START), which was formed in 1971, but renamed START Datentechnik für Reise und Touristik GmbH in 1976 and START Holding GmbH in 1990 (TID, 1994). Apart from TUI, the companies in the consortium that founded START were Lufthansa Commercial Holding, the state-owned railway operator Deutsche Bundesbahn, the travel agent and outgoing tour operator DER, the transport company and charter airline owner Hapag-Lloyd AG and the travel agent and tour operator Amtliches Bayerisches Reisebüro GmbH (abr), all of which were interlinked through a complex ownership structure. DER, Hapag-Lloyd and abr, however, left the consortium a number of years later leaving START owned equally by the other three companies in 1994. START, which became operational in 1979, has been the dominant travel and tourism reservation system in Germany, with a market share of 90.4% of all CRS on-line connections and 88.6% of all CRS terminals in Germany in 1994 (DRV, 1994). When the global travel and tourism reservation system Amadeus commenced operations in 1991, START was integrated into it and became its national reservation system in Germany.

New information and communication systems, like the internal inventory system TRACS, the external tour operator system TOP and the general travel and tourism reservation system START, have yielded great benefits for those tour operators which installed and used them. The domestic British tour operator Country Holidays, for example, regarded the adoption of information technologies as one of the decisive factors involved in its achievement of market leadership in the cottage holiday letting industry in Britain (Mutch, 1993). Lower production costs through, for example, savings in administration costs by using computers and information databases, increased efficiency of operations by streamlining operations and booking procedures, improved effectiveness of management through accurate and timely information, and a greater direct competitiveness of the company's business were the main company internal advantages gained from implementing new ICTs; while improved inter-organisational communication and rapid information exchange were among the main external advantages. Economies of scale, especially through a reduction in administration and distribution costs, and economies of scope, as a result of an extended range of products available, were created.

Porter's positioning and value system models are useful in explaining the main consequences of the use of new ICTs on the structure of the outgoing tour operator business in Britain and Germany. In the perspective of these frameworks, new ICTs, particularly as intra- and inter-organisational networked systems, provided outgoing tour operators with a number of competitive advantages and, in combination with appropriate company strategies, strengthened their position in the industry. For example, these networked systems have engendered barriers of entry, like the TOP system or START which reduced the threat from non tour operating organisations entering the tour operator business by making it difficult to distribute tour operator products by alternative means. The networked systems have also indirectly added value to packaged foreign holidays, for example by reducing costs or by enabling outgoing tour operators to diversify their product range, thus diminishing the threat of new products substituting inclusive foreign tours. Adding value to products and thus increasing their attractiveness to consumers has in addition reduced the threat posed from direct sale by principals and direct purchase by travel agents and consumers. Moreover, new ICTs have been used to respond quickly to changes in supply, for example when airline seats become available, are cancelled or during industrial action situations; and to changes in demand, for example in cases of last minute reservations or when terrorist threats make customers re-book. Airtours, for example, updated the prices of its packaged foreign holidays several times a day in 1994 in accordance with market developments (Skapinker, 1994).

Foremost, intra- and inter-organisational networked systems have increased the communication flow enabling better coordination in terms of speed, accuracy, integrity and quantity of information as well as distance covered both within and between organisations. This has made horizontal integration and forward and backward vertical integration of large organisations, whether hierarchical or cooperative, both feasible and economic by reducing transaction, administration and other costs. Integration has taken place in the outgoing tour operator business either through combining ownership, for example acquisitions or mergers, or by 'electronically integrating' certain functions organisationally, for example electronically locking-in suppliers, buyers and/or other tour operators. While combining ownerships has increased the relative bargaining power of the newly created outgoing tour operator, locking-in suppliers, buyers and other tour operators has decreased their relative bargaining powers and their threats

of direct sale, direct purchase and competition, respectively. In fact, as becomes obvious from Porter's positioning model, integration, both horizontal and vertical, is one of the main strategies for positioning an organisation in the outgoing tour operator business effectively, reducing threats by other outgoing tour operators, suppliers, buyers and potential competitors.

Since operators like Thomas Cook, American Express and Wagons-Lits were founded over one hundred years ago, and especially since the development of package holidays by air in the 1950's, the outgoing tour operator business in Central Europe and in Britain and Germany in particular has seen the continuous rise of large hierarchically controlled operators. A hierarchical outgoing tour operator has the general advantage of having relatively close control over its units and a high enforcement character within its organisation (North, 1990, pp. 54 - 60). While there has been initially a predominantly 'organic' growth of hierarchical operators, the industry has been faced with increasing horizontal and vertical integration since the 1960's. The Thomson Travel Group emerged in 1966 from the merger of a number of British tour operators and TUI was created in 1967/1968 by the merger of four German tour operators. Others were rather latecomers, like the Owners Abroad Group (renamed First Choice Holidays in September 1994), the LTU Group and Airtours, which entered the outgoing tour operator business in the 1980's, aggressively acquiring outgoing tour operators and other travel and tourism companies and increasing their market shares.

Horizontal integration of outgoing tour operators added the advantages of, for example, gaining bargaining power over other companies in the value system and customers; increasing the company's financial strength, thus, for example, allowing survival during price wars and times of recession and facilitating the funding of expensive reservation systems; enabling the realisation of economies of scale and scope; providing a complete and sometimes global service; and producing rewarding job prospects for some employees. A vertically integrated outgoing tour operator gained the benefits of, for example, greater control over supply, such as priority allocation of seats on airlines and beds in hotels, and over distribution including marketing; and it kept profits from both suppliers and travel agents in the company. The major outgoing tour operating groups in Britain and Germany in 1993/1994 are shown in Table 2.

Charter Airline Subsidiaries	Hotel Operator Subsidiaries	Tour Operator Subsidiaries	Travel Agent Subsidiaries
Touristik Union International GmbH & Co. KG (TUI):			
	Robinson Club GmbH and several other resort and hotel operators (> 60,000 beds in total; planned 100,000 beds by 2000)	TUI tour operations including Take Off-Flugtouristik GmbH; Air Conti Flugreisen GmbH & Co. KG, Airtours International (50%), Reise Quelle GmbH (49%), Seetours International GmbH & Co. KG (75%), Wolters Reisen GmbH	Reisebüro Enzmann GmbH (50%); TUI Urlaub Center franchise (66.6%) (141 branches)
Comments: Although TUI had no charter airlines subsidiaries, it had close relationships with the charter airlines Hapag-Lloyd and LTU through indirect ownership. Another important subsidiary of TUI is START Holding GmbH (33.3%). In December 1994, TUI announced the intension to take over ITS, subject to approval by the Bundeskartellamt, the German monopolies and mergers commission.			
NUR (Neckermann und Reisen) Touristic GmbH:			
	Aldiana clubs (> 3,000 beds), Paradise hotels, Royaltur Hotel Group (81.5%) (3,130 beds), Royaltur España (25%) (7,378 beds)	NUR Touristic tour operations; ADAC Flugreisen GmbH (49%)	NUR Reisebüros, Karstadt Reisebüros, Neckermann KatalogWelt + Reisebüro (351 branches in total); Holiday Land franchise (15 branches; planned 200 by 1997)
The Thomson Travel Group:			
Britannia Airways Limited (largest UK charter airline)		Thomson Tour Operations Limited (including Horizon and Skytours names amongst others); Portland Holidays Limited	Lunn Poly Limited (> 700 branches; largest UK travel agent)

Charter Airline Subsidiaries	Hotel Operator Subsidiaries	Tour Operator Subsidiaries	Travel Agent Subsidiaries
The LTU Group:			
International Airways Lufttransport-Unternehmen GmbH & Co. KG (LTU); Lufttransport-Unternehmen Süd GmbH & Co. Fluggesellschaft (LTS); LTE International Airways S.A.	Lufttransport Hotels International GmbH (LTI); Prinsotel (50%)	LTU Touristik GmbH & Co. Betriebs KG (Luft-Transport- Touristik, LTT); Jahn-Reisen GmbH, Meier's Weltreisen GmbH, THR Tours GmbH, Tjaereborg Allkauf Reisen GmbH (52.4%), Transair Flugreisen GmbH	Tjaereborg Allkauf Reisen GmbH (52.4%) (24 agencies)
Comments: The LTU Group had a 10% stake (and one of its parent companies, the Westdeutsche Landesbank Girozentrale (WestLB), another 34%) in The Thomas Cook Group Limited, which in turn had a 21.4% stake in First Choice Holidays PLC, thus creating one of the largest tour operator alliances in the world.			
First Choice Holidays PLC: (formerly Owners Abroad Group PLC)			
Air 2000 Limited (second largest UK charter airline)	3 complexes	First Choice Holidays and Flights Limited (including Sovereign and Freespirit names), First Choice Eclipse Limited; Olympic Holidays Limited	through The Thomas Cook Group Limited (> 400 branches)
International Tourist Services Länderreisedienst GmbH KG (ITS):			
	Sun Parks International (31%), 5 ITC/ITH clubs	ITS tour operations with Jet Reisen GmbH; Euro Vacances System GmbH, Club Calimera International Tourist Clubs (ITC), Kuoni Fernreisen GmbH (49%)	Finass Touristik GmbH, Hertie Reisebüros, Jugendtourist Reisebüro GmbH, Kaufhof Reisebüros, Palmtouristik GmbH, Reisebüro Horten GmbH, Reisewelt Europäisches Reisebüro GmbH (364 branches)
Comments: ITS' parent company Kaufhof Holding AG held a 50.1% stake in Reisebüro Kuoni AG, Switzerland.			

Charter Airline Subsidiaries	Hotel Operator Subsidiaries	Tour Operator Subsidiaries	Travel Agent Subsidiaries
Deutsches Reisebüro GmbH (DER):			
		DER-Tour	Reisebüro Rominger GmbH and a larger number of other travel agents (239 agencies in total); DER-Part Reisevertrieb GmbH (50%; largest German travel agency franchise)
Comments: DER had a 10% stake in Touristik Union International GmbH & Co. KG (TUI). It had also close relationships with Hapag-Lloyd and Lufthansa through indirect ownership. Other important subsidiaries of DER included DER-Data Informationsmanagement, START Btx Reiseberatung GmbH (~12%) and Internet Inc. (11.1%).			
Airtours PLC:			
Airtours International (including Inter European Airways)	Hoteles Pancho (1 club)	Airtours tour operations; Aspro Travel Limited; EuroSites; Late Escapes; Tradewinds	Going Places (> 560 branches; second largest UK travel agent)

Table 2: The major outgoing tour operator groups in Britain and Germany with their principal subsidiaries in 1993/1994

However, major disadvantages of large hierarchical outgoing tour operators are their often bureaucratic structures and consequent inflexibility in responding to market changes, for example in customer demand or through uptake and utilisation of new technologies, and that hierarchical structures, while being able to reward some employees, might discourage others from being innovative and productive. By adopting more loosely organised hierarchical forms instead of tight structures, large outgoing tour operators can reduce these disadvantages to some extent. Most of the major British and German outgoing tour operating groups have in fact implemented such less tightly organised internal structures, by organising some of their activities in subsidiaries and sub-units, which trade more or less independently - and often under different names - with companies outside the organisation, selling, for example, charter airline seats, hotel beds and travel agent services. It should be noted, though, that these more loosely organised structures have again increased the need for information and communication flows, thus underpinning the requirement for investment in and management commitment towards ICT installations to support these flows.

Cooperative outgoing tour operator organisations

Market forms of organisations in the outgoing tour operator value system, i.e. groups of independently trading principals, outgoing tour operators and travel agents, have basically the reciprocal advantages and disadvantages to hierarchical organisations. Economies of scale and scope cannot as easily be achieved, the enforcement character within the organisations is relatively low, making contract violations more likely, the financial strength is weaker, less control over supply and distribution is given and profits have to be shared with other companies. On the other hand, these organisations are less bureaucratic and therefore more flexible in their ability to adapt to changes in the environment and are often more innovative and productive. Since the 1960's, it appears that factors prevalent in the outgoing tour operator business and in the travel and tourism industry in general in Britain and Germany have favoured large hierarchical organisations instead of market-based organisations. While it is impossible to distinguish the exact reasons for this development because of the complexity of the industry and the factors involved, a number of main points can be identified that have been most contributory to this outcome.

A demand for relatively indistinguishable mass market package foreign holidays was present, with many consumers valuing price over individualism, and these holidays were most efficiently provided by large outgoing tour operators through mass production. The presence of high regulation in some travel and tourism sectors, particularly the airline sector, impeded competitive behaviour at some stages of the outgoing tour operator value system and again favoured larger organisations. The absence of compulsory bonding and insurance schemes for all tour operators as a safeguard against failure as well as a guarantee for the quality of service provided is likely to have led to customer mistrust of less well known outgoing tour operators and therefore favoured those better known, which were usually the larger ones. Finally, the original high expenditure inevitably involved in setting up internal and external ICT systems again favoured large outgoing tour operators with their greater available capital.

Basically in response to the bargaining power and threat by the large outgoing tour operators and their increasing domination of market shares, a number of smaller outgoing tour operators

have formed cooperations, partnerships or alliances in Britain and Germany, in some cases also involving partnerships with travel and tourism principals and/or travel agents. Examples of such cooperations are the Association of Independent Tour Operators (AITO) in Britain and the Bundesverband Mittelständischer Reiseunternehmen e. V. (asr) in Germany. These cooperations hold, to some extent, the combined advantages of hierarchical and market organisations, which include a joint image, an increased bargaining power, the realisation of economies of scale and scope by centralising functions like marketing, training and computer systems support, but less bureaucracy and hence more flexibility, adaptability, innovation and productiveness due to relatively strong independence and self-responsibility of their units (Johnston and Lawrence, 1988; Macbeth and Ferguson, 1994; Thorelli, 1986). The typical disadvantages of these organisations are, however, that great coordination efforts are needed for the functioning of the cooperation and that all members have to agree to the membership terms and the decisions of its central unit, thus leading to occasional intra-organisational conflicts (also Miles and Snow, 1992).

New ICTs and industrial change in the British and German outgoing tour operator business: emerging electronic market systems

Several important institutional and technical changes are currently affecting the outgoing tour operator business, which make industrial changes in favour of market-based organisations likely. There is an increase in customer demand for more individual foreign holiday products, away from mass market inclusive foreign tours (Key Note Report, 1991, pp. 20, 26; Poon, 1993, pp. 90 - 92). Deregulation and liberalisation of the international air traffic sector is likely to lead to an obscuring of the demarcation between charter and the scheduled airline sectors and to an increase in the availability of routes and in competition. European Union directives have led to stricter British and German legislation regarding bonding and insurance schemes for tour operators as well as quality approval schemes, thus insuring better customer protection independent of the tour operator chosen. Governmental and competitive pressures have reduced the bias built into some computer reservation systems favouring the system owners' products, and aim to make these systems eventually unbiased (Malone *et al.*, 1987 and 1989; TTG, 1994). Finally, falling system costs combined with improved technology and greater availability of reservation systems enable more and more operators in the travel and tourism industry as well as consumers to connect to reservation systems (Hill, 1994; Reichel, 1994; Richardson, 1994).

These changes have led and will continue to lead to the establishment of electronic market systems. Electronic market systems are ICT systems that enable (usually a larger number of) buyers and sellers to conduct their trading activities electronically, with purchase and sale decisions being predominantly based on price. Price is hereby broadly defined to include not only monies, but also other aspects of a product such as quality. In other words, electronic market systems are marketplaces, where the majority of market related information is communicated and the majority of market related interaction between the participants is handled electronically (Bakos, 1991; Hemberger *et al.*, 1991).

The predecessors of most of today's electronic market systems in the travel and tourism industry in the world were the inventory systems by airlines, which were installed at the end of

the 1950's and during the 1960's (Lange, 1993). These intra-organisational booking systems were expanded to inter-organisational systems in the mid 1970's, by installing terminals in travel agencies and travel departments of large firms. These computer reservation systems (CRSs) were originally single-access systems, allowing travel agents only to access the airline that operated the individual system. At the end of the 1970's, however, the airline reservation systems became co-hosted systems, displaying the availability and prices of partner airlines next to those of the owner airline. At the end of the 1980's and early 1990's, particularly through the creation of the two European reservation systems Amadeus and Galileo in 1987, the major reservation systems finally became multiple-access systems and in fact electronic market systems, allowing the booking of seats offered by a larger number of airlines by interconnecting one CRS with another.

By mid 1993, following a number of reservation system mergers, five major CRSs existed in the world: Galileo International with an estimated market share of about 31.7% in mid 1992 according to number of terminals, combining those of the then still separate systems Apollo and Galileo, Sabre with 28.2%, Worldspan with 13.6%, System One with 10.4% and Amadeus with 10.3%, controlling combined about 94.2% worldwide (Feldman, 1992, p. 50). Parallel to these CRSs, other travel and tourism principals have installed their own global reservation systems, in particular large and mainly international hotel chains, car rental companies, providers of travellers cheques, operators of major attractions, restaurant chains, and operators of railways, ships and ferries. One example is the international hotel group Hyatt, consisting of the three companies Hyatt Hotels and Resorts, Hyatt International Corporation and Hyatt Hotels Corporation. Hyatt operated its own reservation system, which was accessible through central reservation offices around the world as well as through links with several of the main CRSs. In fact, through direct and indirect gateways, a large number of principals' reservation systems are accessible through the CRSs, thus making them global distribution systems, or global electronic market systems, for a broad range of travel and tourism products.

A further example of a development with potentially far reaching consequences for the distribution of travel and tourism products is the creation of the 'Travel Web' on the global communication network Internet by The Hotel Industry Switch Company (Thisco) in October 1994. The hotel group Hyatt was the Travel Web's first user, offering room availability in 16 of its hotels directly to Internet users. Other hotel chains and international cruise lines have also become available on networks like Internet and CompuServe, and DER has bought an 11.1% stake in Internet Inc. in the United States. Moreover, major international telecommunication services providers, like Deutsche Bundespost Telekom and France Télécom (Lüttich, 1992), and large national and multi-national corporations with extensive corporate networks, like the German Veba group of companies with its subsidiary Stinnes-data-Service GmbH, have entered the travel and tourism market, providing information and communication services for travel and tourism companies.

Indeed, it is likely that eventually travel and tourism information and reservation systems will exist for basically all major travel and tourism products, spanning transportation, accommodation, catering, car rentals, travel insurances, tickets for performances and even general information such as weather, traffic reports and information about local attractions (Ritz, 1992; Schmid, 1994). A number of pilot projects for such systems, most notably the

domestic and incoming Tirol Informationssystem (Tyrol Information System, TIS) (Ebner, 1992; Werthner, 1993), which might be enlarged to cover the whole of Austria, have been in operation for a number of years and, if successful, will lead to major changes in the travel and tourism industry and in the outgoing tour operator business in particular. A similar system is TIBS (Touristische Informations- und Buchungssysteme / Touristic Information and Booking Systems) & GermanSoft, run by a consortium including TIBS GmbH and START Holding GmbH. TIBS/GermanSoft offered regional and local information and the booking of hotel rooms and tickets for performances, among other functions, in Germany in 1994.

One could picture two general types of electronic market systems in the outgoing tour operator value system in the future, as graphically illustrated in Figure 3, replacing the traditional means of distribution, first for travel and tourism products that can be relatively easily described electronically and, at a later stage using more sophisticated multimedia technologies, for basically any travel and tourism product available.

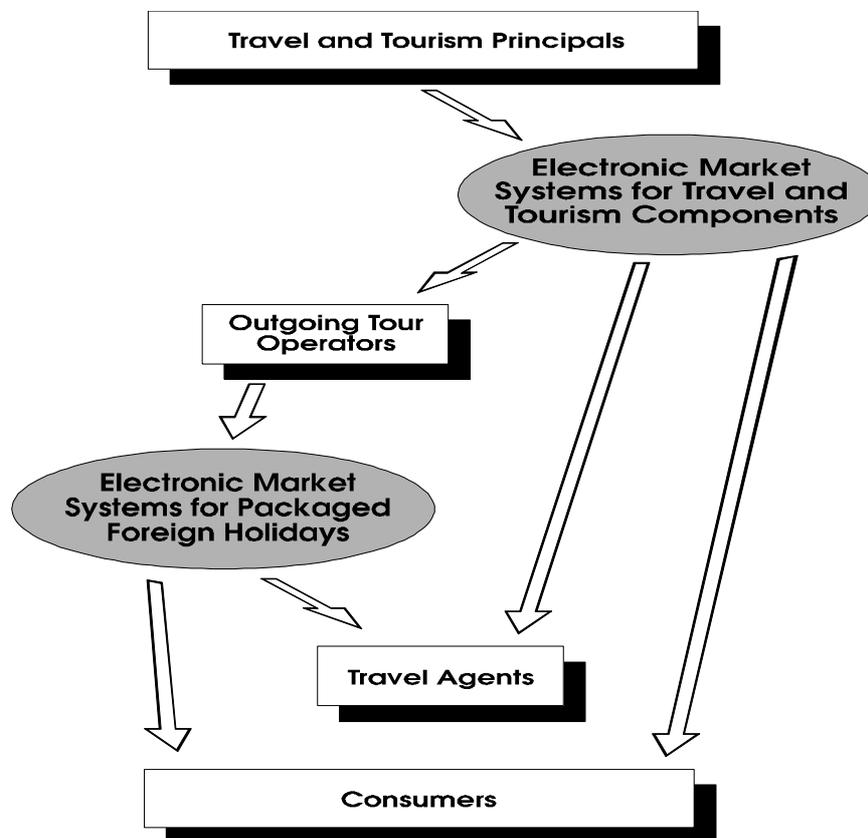


Figure 3: Emerging electronic market systems in the outgoing tour operator business (note that other distribution ways are not shown)

The evolution of these electronic travel and tourism market systems might even include the establishment of regulatory organisations, supervising the trading companies similar to electronic stock exchanges or electronic agricultural auctions (Borman *et al.*, 1993).

Conclusions and outlook: the value added by outgoing tour operators

New ICTs, particularly as intra- and inter-organisational networked systems, have been one of the most contributory factors to industrial change in the British and German travel and tourism

industry in general and the outgoing tour operator business in particular since the 1950's and 1960's. By improving communication and information flows, they have enabled the formation of effective and efficient forms of large hierarchical and vertically integrated outgoing tour operator organisations. Cooperative forms were founded subsequently by smaller outgoing tour operators and other travel and tourism companies to gain parity with their larger competitors, since certain institutional and technical factors did not permit efficient and effective market-based organisations. Many of these factors, however, have been altered or are currently changing, thus making the creation of global and comprehensive electronic travel and tourism market systems highly probable.

The development of electronic market systems may have major consequences for the outgoing tour operator business in Britain and Germany. Firstly, it may affect the relationships and competition between outgoing tour operators. For example, with more and more travel and tourism principals being accessible through 'electronic market systems for components' and hence with reduced search costs, and with increased acceptance by travel agents and consumers of 'electronic market systems for packaged foreign holidays' and thus with reduced distribution costs, large outgoing tour operators can diversify by enlarging their product scope and compete in niche markets, which were previously financially unattractive to them and only catered for by small and specialised outgoing tour operators. In contrast, small outgoing tour operators can, by adopting new information and communication technologies due to their increased availability and reduced costs, achieve economies of scale and scope as well, thus entering markets previously within the domain of large outgoing tour operators. Secondly, electronic market systems may also have consequences for outgoing tour operators and their relationships with travel and tourism principals, travel agents and consumers in the outgoing tour operator distribution chain, both in the form of threats and opportunities.

On the one hand, taking the continuous advance of electronic selling methods, especially most recently through integrated services digital networks (ISDNs) and multimedia technologies (Economist, 1995), into consideration, these new trading methods will threaten the existence of some outgoing tour operators (and travel agents) in the travel and tourism value system through disintermediation. The model of the value system is based on the idea that each organisation in the system adds value to the products that pass through it. Assuming a competitive environment, those organisations that do not add value will eventually be bypassed or disintermediated through direct sale and purchase. The main functions of an outgoing tour operator are to assemble various components produced by the principals within the industry into a foreign travel or holiday package by investing time, money and effort, thus reducing the information load for consumers, and to add supplementary services such as provision of tour representatives and special programmes. Electronic market systems will threaten to make outgoing tour operators redundant to the extent that they will enable principals to advertise their products more widely and effectively directly to customers, and allow customers to search for products with less time and costs involved. This threat of disintermediation can be countered, though only to some extent, by financially strong tour operators through vertical integration, for example, by owning or exclusively cooperating with charter airlines, cruise ship operators, hotels, holiday clubs, destination agencies and travel agencies, as practised by basically all major British and German tour operator groups.

However, disintermediation could be a real threat especially for smaller tour operators which have less capital available.

On the other hand, given the wide adoption and diffusion of electronic market systems in the travel and tourism industry and given a shift in consumer preference towards more individual products, these developments will also provide new opportunities for outgoing tour operators and will increase the relative importance of those who are able to adapt to this new environment and who will provide individual services. Electronic market systems will enable outgoing tour operators and principals to produce an increasingly broad range of new products. By adding value through assembling firstly more individual and secondly a wider range of packaged foreign holidays, such as special-interest, activity and 'itinerary-build', i.e. tailor-made (Gooding, 1994), foreign holidays, outgoing tour operators can use the emerging electronic market systems to their immense benefit. Therefore, while strategies like horizontal integration can secure the position of outgoing tour operators for some time, adding value needs to be regarded as the ultimate strategy for achieving long-term success in the outgoing tour operator business.

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The non-market preconditions of Electronic Markets

Kai Reimers

Abstract

This article addresses the question of which incentive structure is needed if we are to see the emergence of Electronic Markets. It is proposed to adopt a rather narrow concept of Electronic Markets which strongly relies on the notion of a competitive price mechanism in order to identify those pre-conditions which are specific to Electronic Markets as compared to other Interorganizational Systems. A theoretical framework is elaborated which distinguishes between the institutional regime shaping market participant's transaction behavior, a set of meta-activities which establish and maintain the institutional regime and a generative regime which is the group of actors performing or delegating meta-activities. All three components constitute the notion of non-market preconditions of market systems. This theoretical concept is then applied to the discussion of the specific non-market preconditions of Electronic Markets. It is concluded that the applicability of this new coordination mechanism is restricted to groups establishing organised markets on the basis of strictly monitored membership rules.

Introduction

The promise that the concept of Electronic Markets offers is fascinating. First, the limiting factors of time and space seem to have been overcome. Electronic Markets are ubiquitous and available 24 hours a day (Schmid 1993). Second, Electronic Markets seem to be more 'just' and 'democratic' as well as more competitive and decentralized (Himberger et al. 1991; Malone, Yates and Benjamin 1987). Third, it seems that some types of market dysfunctions (such as negative externalities) could be avoided through programming (Miller and Drexler 1988), although, of course, the 'classical' negative externalities will persist as long as there is a physical counterpart to the property rights traded on Electronic Markets (Coase 1960). Following these arguments, Electronic Markets could be considered manifestations of the neoclassical ideal, reducing transaction costs to a negligible minimum (Schmid 1993).

Thus, it would seem desirable to create as many Electronic Markets as possible in order to improve economic efficiency and social justice. However, it is clear that Electronic Markets neither fall from heaven nor do they emerge via the Invisible Hand. Instead, they have to be constructed (Schmid 1993, p. 468). Thus, we need some knowledge about 'construction principles' and about those who might be willing to apply them, i.e. construct Electronic Markets (at least as long as we do not want to construct them ourselves or have legislative authorities construct them). These two aspects describe a set of conditions which must be met if Electronic Markets are to come into existence. Translating these arguments into economic terminology, we have to analyse the institutional rules which must be provided to make Electronic Markets work and we have to analyze the incentives which might stipulate economic actors to organise Electronic Markets, i.e. provide the necessary institutional rules including their enforcement. The analysis of these two critical factors constitute the topic of this paper.

The definition of Electronic Markets revisited

Up to now, talking about Electronic Markets has always required a definition since there is no widespread common understanding concerning the concept. A state of the art discussion can be found in Schmid 1993. He suggests defining the concept of Electronic Markets according to the different transaction phases which have been elaborated in transaction cost theory. Electronic Markets in a narrow sense are then assumed if all possible transaction phases are supported electronically. Yet, he prefers using the term Electronic Markets in a wider sense, that is if at least one phase is supported electronically (Schmid 1993, p. 468).

The question arises as to whether this definition of Electronic Markets suffices to exclude a big enough amount of phenomena that it remains a meaningful theoretical concept. Let us, for the moment, assume that this is the case. However, it should be clear, that the electronic transmission of invoice data does not establish an Electronic Market, although it definitely is part of a certain transaction. Thus, we have to identify a 'kernel' of activities, which are essential to the establishment of an Electronic Market. Approaching this questions in an incremental way, I want to map some rather well known forms of electronic transacting onto the phase scheme of Schmid (1993), who distinguishes between search and information phase (initiation phase), negotiation phase and transaction processing phase (see figure 1).

To begin with, in the construction industry a market situation is opened through the 'invitation to tender' of a client. After a number of tenderers offer their tenders, a contract might be established according to the selection rules of the client. In principle, all three acts can be accomplished electronically and for all three acts UN/EDIFACT Standard Messages have been published.¹ This implies that a contractor has not yet decided with whom to do business when starting the process. According to the transaction-phase-scheme, he is initiating a transaction by looking for business partners. The terms of the business are specified within the invitation to tender. The terms of business, comprising the specification of what constitutes the product (services, materials, financing etc.) and the price might be modified by tenderers through their tenders, although this kind of negotiation will rather occur exceptionally.

sector	electronic document	transaction ...		
		initiation	negotiation	processing
con- struc- tion	invit. to tender			
	tender			
	contract			
stock market	bid/offer			
auto	JIT-delivery			
apparel	dispatch advice			
con- sum- er goods	order			
	order confirm.			

Figure 1: Exemplary forms of electronic transacting in different sectors

¹ See the UN/ECE Journal on Trade Facilitation and UN/EDIFACT 'connections', 1994, Issue 1.

In contrast, the typical procedure leading to a contract in the consumer goods sector starts with an order from a retailer and is concluded with either the actual delivery or the dispatch advice. If, for example, the order includes a price statement, the seller accepts this price with the actual delivery. When a retailer places an order, he has already decided with whom he wants to do business and on what terms. The only way to 'negotiate' within the framework of this business process is for the manufacturer not to deliver, which could hardly be called a negotiation process. In any case, placing an order only makes sense for the retailer if he can assume that both sides have agreed upon the terms of the specific business. This means, that the initiation and negotiation phase must have taken place some time in advance, specifying the special business relationship between the two business partners (settlement terms etc.) and the product to be traded. Yet, this mutual understanding of the terms of business seldom becomes explicit; instead, it emerges as a result of long-lasting business relationships with product and price being standardised to a certain degree.

A third type of business process can be found in those sectors where the specifications of a product are not stable, for example in the automotive and the textile sectors. Here, terms of business are often fixed in general contracts according to which business contracts are concluded. The specific business contract may be concluded either directly through the delivery of goods according to a schedule fixed in the general contract (textile example) or may be initialized through a 'demand of delivery' (JIT-delivery) by the manufacturer and only then be concluded through the actual delivery (automotive example). It is difficult to imagine a way of drafting a general contract electronically since it often involves a lot of haggling.² 'Demand of delivery' and 'dispatch advice' are nevertheless frequently used EDI messages, which exist as UN/EDIFACT Standard Messages and a number of sector specific and/or national dataformats (EDITEX, VDA, ODETTE etc.).

Clearly, it is the business process which evolved on stock markets which comes closest to the "ideal economic market" (Schmid 1993, p. 468). They are open in that there are many bidders and takers that refer to standardised contracts. Thus matching according to the sole variable 'price' becomes feasible. Since contracts are standardised, they are concluded through the 'meeting' of a bid with an appropriate offer. If there is no bid to fit an offer no contract can be concluded. As with the construction example, the initiation phase can be conducted electronically. Since the conditions under which contracts will be concluded are defined in advance (by the stock exchange) there seems to be no negotiation phase proper. The negotiation phase is replaced by the statement of whether these conditions are given or not. If so, a contract will be concluded automatically.

According to the broad definition of Electronic Markets all of the above described examples would qualify as Electronic Markets. However, one essential criterion as formulated by Schmid himself is still missing. Schmid demands that Electronic Markets make use of the market mechanism (Schmid 1993, p. 469).³ As I am going to argue (see section 4) a market

² To be sure, haggling is likely to be part of any kind of business transaction. Nevertheless, it seldom becomes a part of the formal contracting scheme.

³ Schmid tones down the argument by saying that the definition of Electronic Markets should at least be commensurate with the market mechanism. This, however, gives a different meaning to the statement. What he seems to have in mind is that electronic trading systems should not be anticompetitive. Yet there

mechanism essentially consists of a competitive price generating mechanism. If we accept this notion of a market mechanism, only the construction and the stock market example appear to be true Electronic Markets since only here does price competition determine the matching of supply and demand (although in the construction example, true price competition exists only on the supply side). In all the other examples competition takes place, if at all, beyond the electronically supported part of the business process. Only the transaction processing, which takes place after more or less perfect competition may have selected the business partners, is supported electronically. I therefore propose to speak only of Electronic Markets if business processes are supported electronically in the initiation and negotiation phase, irrespective of the way the transaction processing takes place.

A Theoretical framework for analysing the pre-market conditions of Electronic Markets

The distinction between electronic transaction processing and electronic transaction initiating and negotiating is relevant to the topic of this paper, because the pre-market conditions of both are rather different. Especially since, as I will argue, the pre-market conditions are much more restrictive in the case of Electronic Markets than for EDI applications which support solely the processing phase of a transaction. Let me first explicate what I mean with the notion of pre-market conditions or non-market preconditions of Electronic Markets.

If we consider a business process as, by way of example, described in the foregoing section, we can think of the business process as a coherent *set of distinct activities*. Examples of these activities are the filling out of an 'invitation to tender' form, the transmission of data, the conversion of data etc. In order to make up a single transaction these activities must be organised in a certain way. The question is, according to which principles are the different activities organised and selected? Of course there is a number of formal rules which are specific to the individual participating organisations and thus account for a large part of the way the activities are organised. It is, however, clear that these internal rules do not completely determine the way transaction activities are organised. There is a set of other, external rules which must be observed as well. The sources of these other rules are manifold. There is, of course, the legal framework within which the business partners interact. There are other, formal and informal rules in between, for example generally acknowledged business principles, general terms of trade etc. We call the sum of all these rules institutions, as long as they are not specific to any particular organisation. Thus, the habit to issue one invoice per order instead of one invoice per delivery becomes an institution if it is part of a regulatory framework which applies to a number of organisations. It is not an institution if this choice is up to each individual organisation which may have elaborated definite procedures, in which case it is part of the formal organisation of that organisation.⁴ We therefore can identify a set of institutions which

are many systems which are not anticompetitive but do not add to the coordination function of the market either. This, however, is the purpose of Electronic Markets.

⁴ In this paper I focus on the institutions as part of the pre-market conditions of Electronic Markets although the formal organisation as such forms an important part as well. It is well known, for example, that benefits of EDI can only be reaped if the formal work organisation is adapted (Benjamin, de Long and Scott Morton 1990).

determine the way distinct activities are organised as part of a business process. I call this set of institutions the *institutional regime* under which business processes take place.

Thus, the institutional regime 'explains' the way in which activities within and between trading organisations are organised. If one prefers a certain way these activities are organised, for example in the form of an Electronic Market, one could call for those institutions which provide a necessary condition for the emergence of Electronic Markets. However, as already mentioned, there are institutions on many levels and only a few of them have clearly defined actors responsible. Indeed, in states ruled by law, the legislative body and the jurisdiction provide for the legal framework. But there are many other institutions which must be created by the economic system itself. For the time being, I do not want to try to identify the actors who generate these institutions but rather construct the theoretical category of *meta-activities*, which are aimed at these institutions. We can identify, for example, the activity 'standardisation of dataformats' which is required in many instances of emerging Electronic Markets without attaching it to a specific organisation which may carry it out, since there are many potential organisations for that purpose (for example national and international standardisation organisations, industry associations, chambers of commerce, informal working groups of companies etc.). Yet it should be noted that there are many meta-activities, which must operate continuously in order to keep up a certain institution, as in the standardisation of a product which often requires continuous testing and certifying if this standard is to have any normative power. Thus, it would seem as if the organisation which carries out the meta-activity becomes an institution itself (for example the Consumer Report and the Good Housekeeping Seal).

Finally, we need a theoretical category for describing the actors who decide which meta-activities must be installed to generate the necessary institutions which, in turn, might induce the emergence of a certain form of organisation for transaction-related activities. I call a set of these actors a *generative regime*. A generative regime could be one single business organisation or the whole legislative body. It does not create institutions directly but via decisions on meta-activities. Thus, the International Standardization Organization (ISO) for example, would be called a generative regime although it does not produce standards itself but establishes or designates working groups with the sole purpose of developing a desired standard. The proceedings of these working groups would then be called meta-activities.

Of course, we could imagine one powerful actor who designs an Electronic Market creating the institutions and the system (i.e. organisation of transaction related activities) simultaneously. In this case, the three categories, institutional regime, meta-activities and generative regime, would fall into one. Nevertheless, I think it useful to distinguish among these categories since, on the one hand, there are several empirical possibilities of their combination as hinted at above, and, on the other hand, we are thus enabled to locate much more precisely where hinderances to developing Electronic Markets exist. Indeed, we can be quite sure of the necessary institutional regime for a specific Electronic Market but there might simply be no actor capable of creating the corresponding meta-activities, i.e. a likely generative regime. Similarly, we can identify several generative regimes which are not able to define the correct set of meta-activities.

Figure 2 describes how the four categories are related. This graphical representation indicates that these four categories form a closed model of how institutions emerge. Of course, this model does not reveal any information about how the institutions, in the case of a specific problem, should look like. It only states a general functional mechanism. To understand this functional mechanism let us first consider the following highly stylised story: The story sets out with the management of an apparel manufacturer analysing its internal organisation of activities. The analysis reveals that there would be a huge rationalisation potential if orders were keyed in automatically. Order processing could be much faster, decreasing stocks and improving market performance. The manufacturer asks his retailers to transmit orders electronically and in a specific dataformat. Since the retailer does not want to loose this manufacturer (who enjoys the success of a powerful brand name) he meets the manufacturer's demand. In a similar fashion other manufacturers approach our retailer until he refuses to meet individual demands any longer. Instead, he asks the manufacturers to agree upon one single dataformat for orders. In case he is not powerful enough to do so he might seek a coalition among several retailers who share the same problem. The manufacturers set up a committee which designates a working group for the purpose of drafting a proposal for a standard order dataformat. After this has been accomplished they publish the standard order dataformat and agree to use it when negotiating with retailers.

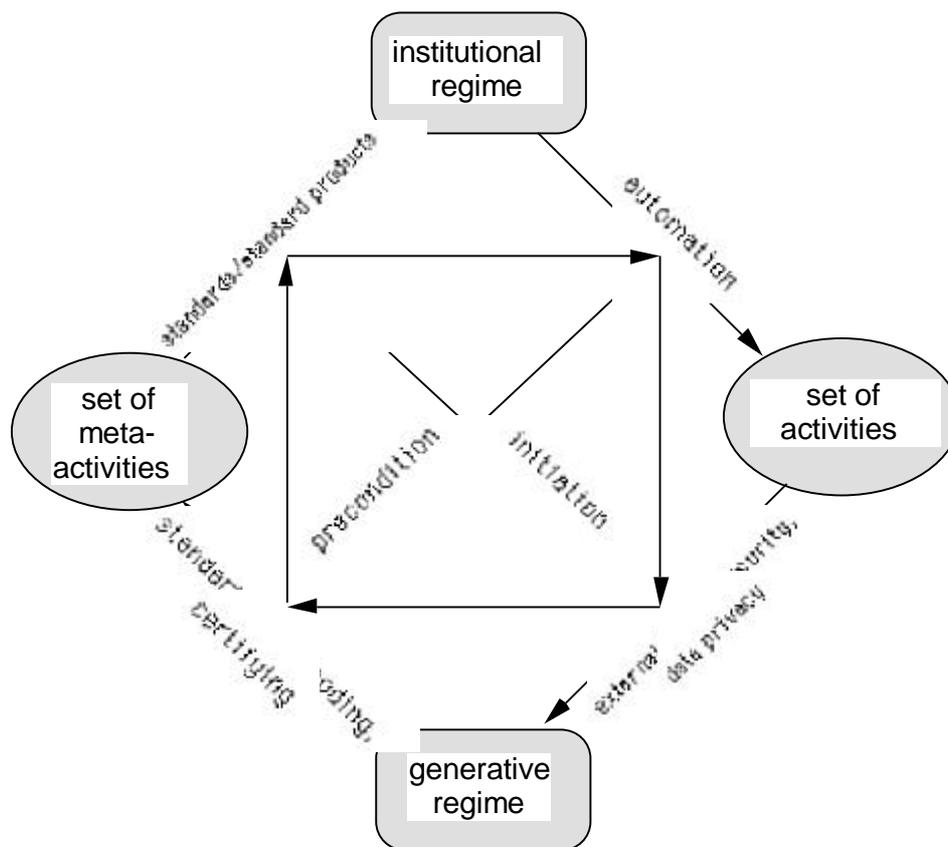


Figure 2: A model for the generation of market institutions

In this case, the wish to automate some activities within several organisations (*set of activities* in figure 2) started a process which resulted in a modification of the *institutional regime* (by adding a new standard to it). The independent demands of several manufacturers did have external effects among themselves in that they motivated the retailer to change his negotiation strategy. Thus, the manufacturers had enough incentives to mobilise a *generative regime* which decided over *meta-activities* in order to produce the necessary amendment to the institutional regime. The external effects could be considered a cause of the new institution which worked through the mechanism of generative regimes and meta-activities - the standardisation activities constitute a necessary precondition for the automation of order processing activities on the manufacturers' side. There are other classes of possible causes such as data privacy issues connected to the automation and rationalisation process in, lets say, banking organisations. Besides standardisation, certifying and coding activities might prove essential preconditions for automating processes in organisations. The descriptors of the arrows, linking the four categories, are only meant as examples. There are many other possibilities.

It is now possible to specify much more clearly what is meant with the notion of non-market preconditions of Electronic Markets. First, this term refers to the institutions which must be added to the institutional regime governing the desired form of market organisation (Electronic Markets). There are some proposals concerning this question. Second, we have to identify the set of meta-activities, which generate the required institutions. Third, we must analyse the incentives which might induce actors to set up or mobilise generative regimes which decide over meta-activities. I will deal with each of these issues in turn in the following section.

Institutional regimes, related meta-activities and generative regimes of Electronic Markets

The normative thrust of the notion of Electronic Markets stems from their assumed superior economic efficiency with regard to, let's say, electronic hierarchies (Malone, Yates and Benjamin 1987).⁵ The idea of using markets as a means of coordinating economic activities relies on the ability of prices to guide decisions concerning the allocation of scarce resources. In order to be able to do so prices must contain information about all transactions being accomplished at a given moment (which, in reality, is always a time span). Thus, if Electronic Markets are to accomplish this coordination function, they must provide a mechanism which guarantees that prices contain this kind of *non-local* information. Only a price mechanism which meets the following two criteria warrants this kind of information. (1) Every market transaction decision must be guided *only* by prices and quantities. (2) Buyers and sellers must compete among each other.

A contrary opinion can be found in Klein and Langenohl (1994). They contend that "within electronic markets and interorganisational systems, a wide variety of coordination or trading mechanisms, such as auctions, offer/accept and matching systems, are used." (Klein and Langenohl 1994, p. 262). However, those mechanisms do not fully incorporate a competitive price mechanism. An auction system allows for price competition among buyers but not among sellers. If an offer/accept mechanism is used prices do not adapt to demand in the short run and

⁵ There is no de facto superiority of markets in the sense that they drive out other coordinating mechanisms such as hierarchies. In fact, hierarchies tend to replace markets if not prevented from doing so e.g. through competition authorities.

matching systems only incorporate a competitive price mechanism if the sole matching variables are price and quantity. Thus, Electronic Markets which are expected to have the beneficial effects concerning the allocation of resources should come close to a mechanism which is, for example, employed by stock exchanges.

With respect to the possibilities of automating stock markets, Sanford Grossman argues: "Technology cannot solve a fundamental problem faced by market makers or customers who are searching for the best prices. This problem is that a deep liquid market requires firm bids and offers for large sizes. But, anyone giving such firm bids for large size is giving the market a free option to hit his bid." (Grossman 1989, p. 15, as quoted in Mulherin, Netter and Overdahl 1991, p. 634). This means that, unlike in a bilateral negotiation situation, it is not possible to find out step by step what the maximum amount is, that the counterpart to the trade is willing to pay (resp. the minimum amount he is willing to accept), but that one has to make a firm offer and accept whatever the price-generating mechanism will declare as the market price. It is not possible to adapt the offer to this price since the price would not be stable and hence would not be a market-clearing price.

Thus, the designer of an Electronic Market which functions similarly to a stock market faces two major problems. First, he or she has to make sure that market participants stick to their offers (rendering purely speculative offers designed to rise or dump prices impossible). Second, he or she must ensure that offers made inside the Market are not used by outsiders to sense maximum individual trading benefit. If a participant inside an Electronic Market does, for example, make an offer, an outsider can use this offer as an indicator and adapt his own price accordingly without having made a firm offer himself. The outsider will then make a business deal whereas the inside participant will only have functioned as a price indicator foregoing any business deal. Trust and free-riding turn out to be the principal problems of establishing price mechanisms. Mulherin, Netter and Overdahl (1991) therefore conclude: "... even as technology develops, rules restricting off-exchange trading can be expected to persist." (p. 634). Thus, the result of our analysis is, that strategic behavior and free-riding remain present in any kind of market and that very restrictive rules will be required if markets are to be furnished with price generating mechanisms, which is especially true if price generating mechanisms are automated as in the case of Electronic Markets.

Let's now have a closer look at these rules, which constitute the institutional regime. There are several questions which can guide the discussion. (1) Is it possible to trade any kind of commodity on Electronic Markets? (2) How could trust issues be resolved in Electronic Markets? (3) How are property rights defined in Electronic Markets?

(1) If one wishes a market with an automatic price-generating mechanism, it is clear that buyers and sellers must have an *ex ante* mutual understanding of what they are talking about when offering a deal. An offer then consists of the name of that product or service and the price (or price-range) at which one is willing to buy or to sell. However, it is often difficult to reduce a certain product or service to one name. Instead, one might wish to specify the product through a number of attributes. If one wishes to buy a computer, for example, it is definitely not enough to use the name 'computer' but to add, at least, its memory capacity, processing speed and other technical details. But how can one be sure of its quality? As is well-

known (see e.g. Barzel 1982), trade marks serve as an indicator for quality. Thus, one might add certain brands one wishes to buy. Finally, if one wants to save money and decides to buy a second-hand computer, other specifications such as age and physical condition become necessary. In many instances, the only way to judge the qualities of an offer is to have a personal look at it. Is it still possible to use a price generating mechanism for trading such kinds of goods (in this case, used personal computers)? Theoretically, yes. You can hire someone who will collect all the offers and demands and sort them out according to attribute specifications, thereby creating different categories. This person will then examine all the offers and put a stamp of quality on them, which certifies that all required attributes are present. Offers and demands will then be linked to prices or price-ranges and a clearing price will be stated at which a number of deals will be executed. The stock exchanges' listing of equities is an example of putting a quality stamp on a product. The generating of financial derivatives is an example of classifying different kinds of products. Some will be traded on the exchange, some will not (according to the policy of the exchange and to the regulatory environment). Therefore, it is not necessary to standardise products before they can be traded in markets with automatic price-generating mechanisms, as Himberger et al. (1991) contend. However, it is necessary to do some sort of classification which makes the products homogeneous in a specific sense.⁶ Products are homogeneous (belong to the same category), if differences among them are regarded as irrelevant to sellers and buyers respectively.

Furthermore, there is one kind of property which seems quite astonishing at first glance. If products are traded whose supply in terms of production is elastic, price changes will immediately lead to changes in its supply. If prices increase, for example, production output will be increased immediately, causing prices to fall again. Therefore, production output must be unelastic to price changes to some extent, since otherwise there would be no traders investing in this product. If they did, the only motive would be to preserve their capital value. There would be no gains through raising prices. That means that the products must be scarce in the sense that their total supply should be constant.

(2) The central question when it comes to trust issues is whether it is possible to solve the problem of opportunistic behavior other than by restricting membership. In order to answer this question let us first consider what membership is supposed to do in markets with a price-clearing mechanism (whether automated or not). As noted above, the central problem of markets with a price-generating mechanism is that of extra-market dealing using firm offers as price indicators. On the one hand, there must be somebody giving a firm bid, on the other hand this offer must be prevented from being used by others who did not bind themselves by firm offers. Firm bids are necessary to determine the market clearing price. If a market clearing price is in the interest of all participants, it can be regarded as a public good, its contributions being firm bids. However, everyone can profit from this without having contributed their share, by using the price as an indicator for their own offer and thus being able to simply undercut firm offers. Therefore, the price-generating mechanism represents a classical collective good. Applying Olson's analysis, we can conclude that price-generating mechanisms will be provided

⁶ Therefore, I do not agree with Himberger et al. when they state that changes in the attitudes of market participants and new technological developments make standardisation superfluous (Himberger et al. 1991, p.13).

only if either coercion or selective incentives are used (Olson 1968). Clearly, restricting trade to members represents the solution through coercion. Theoretically, the second possibility would thus be to use selective incentives. Selective incentives must at least compensate the gains which could be made through free-riding (i.e. off-exchange trading in the case of stock exchanges). Considering the huge profits which could be gained from free-riding in the case of stock exchanges (i.e. insider trading), it seems rather impossible to devise an incentive mechanism which would accomplish this. I therefore conclude that restricting membership is the only possibility to create a price-generating mechanism.

(3) Let me, for a moment, return to the used computer market to clarify some aspects concerning property rights in Electronic Markets. If you buy a used computer, how do you have to pay the purchasing price (period of payment etc.)? Who will take the risk when delivering the computer? Who will pay insurance fees? Who will pay the one who did check the attributes and classified the computers? What can you do if the computer breaks down after two days of use? Whom can you ask for help when you have problems using the computer? etc. etc. As can be easily seen, there is a great number of details which must be settled in order to execute the agreed upon exchange. All these details, in turn, may influence the price. If a seller, for example, offers the buyer an introduction to the use of the computer, he may be able to ask a higher price from a novice user. However, an already experienced buyer would hardly appreciate such an offer. Thus, a price-generating mechanism requires that all those details of the contract, that might influence the price itself, be settled in advance just as the classification of products makes up a necessary condition for a price-generating mechanism. Also, a price-generating mechanism would be of no use at all if, after having agreed upon an exchange, the parties started haggling over details of transferring property rights. Thus, contracts must be standardised in order to use a price-generating mechanism.

To sum up, there are *three dimensions* in the institutional regime which can be analytically separated. These are: *product*, *partner* and *contract*. The institutional regime must provide rules as to how products are defined and specified, rules which solve the problem of opportunistic behavior among business partners and rules which define property rights and issues related to the exchange of property rights. For all three dimensions, there exist a variety of rules which are complementary or substitutional to one another (see figure 3). Let us consider the *product dimension* first. A product can have a trademark which may indicate some quality properties. Additionally, it might carry a stamp of quality by a neutral organisation, which provides a still stronger indication of quality. Finally, it might incorporate accepted standards which are essential in some areas such as computers. However, the incorporation of a standard may come without trademark and stamp of quality. Also, a trademark may replace the function of a standard. A computer may use, for example, proprietary protocols instead of standardised ones.

	definition of property rights	definition of trust issues	definition of products
 general specific	commercial and consumer law	corporation and criminal law	product standards
	general terms and conditions/ standardized contracts	membership in multilateral organization	mark of quality
	general contract	bilateral relationship	trade mark
	contract	partner	product

Figure 3: Examples for rules making up an institutional regime in its three dimensions

The 'partner-dimension' mainly deals with trust issues. Trust might be established within bilateral relationships through gradually improved mutual understanding and carefully calibrated safeguards. Alternatively, trust might be founded on the membership in a multilateral organisation which sees to its members' compliance with accepted behavioural norms. Thus, bilateral and multilateral trust building techniques can substitute one another. They may be complementary as well. Firms, for example, can entertain long-term relationships with specific trading partners to safeguard against trading risks, but rely on membership in a multilateral organisation for the purpose of electronic exchange of business documents (see Kubicek 1992a). There is also a 'default' institution provided by the legal framework through corporation law and criminal law. Corporation law classifies firms according to their risk exposure and their capital requirements while criminal law punishes certain forms of opportunistic behavior. Yet, most business agents seldom rely solely upon these institutions.

Property rights, as the main ingredient of the contract dimension, can be defined in standardised contracts as described above. Similarly, there may be general contracts defined on a bilateral basis, which must be detailed by further, more specific contracts. Additionally, general terms and conditions might provide some default rules, thus rendering superfluous a long list of clauses which would repeatedly have to be added to specific contracts. Ultimately, commercial law and consumer law provide the rules which are used if no explicit contracts have been drafted or if explicit contracts could be interpreted in several ways.

Let us now consider the corresponding meta-activities. All these institutions have to be provided in one way or another. In some cases this is a matter of a group of people coming

together to draft a document and publish it. The published document thus represents the institution. However, in most cases, this is not enough. Even the incorporation of the most simple standards has to be checked in one way or another. If nobody else does, the consumer or buyer has to do it. If he does so before concluding the purchase contract, the seller has an incentive to see that the standard is properly incorporated. If there are many buyers checking proper standard incorporation, the incorporating of this standard becomes a public good. Any buyer can rely on the other buyers' checking efforts, thus shirking from doing so himself. Thus, we might expect the emergence of some certifying organisations (for the moment I will not bother myself with the sort of incentives which would make them emerge) which control proper standard incorporation, providing incentives for sellers to properly incorporate standards. We can thus state that there must be some sort of certification which is necessary to make a standard effective. In other words, the publishing of a certain standard could hardly be called an institution if it requires certification for being effective but no certification is being done.⁷ The activity 'certification' is thus necessary to constitute the institution of a certain standard.

Similar cases could be made for other institutions, a stamp of quality, for example, which immediately implies a quality control checking, and the establishment of membership rules to a multilateral organisation, which must be enforced as well. In considering Electronic Markets, there is a whole class of activities related to standardisation of dataformats, devising codes for qualifiers and others, which are specific to electronic communication. I do not want to deal with this class of meta-activities here since they are dealt with extensively in the context of Electronic Data Interchange (see Kubicek 1992b). Instead, I want to sort out those meta-activities which are specific to Electronic Markets.

⁷ There is a class of standards which are self-enforcing due to reciprocal external effects. We do not deal with this kind of standards here (see Reimers 1994).

enforcement of membership rules	- provision of firm bids - ban of off-exchange trading - provision of solvent participants
operating of a price generating mechanism	
classification and quality checking	
standardization of contracts	
transaction processing	- handing over of property rights - financial clearing

Figure 4: Meta-activities specific to Electronic Markets (except those dealing with electronic communication)

Figure 4 summarises the list of meta-activities required for Electronic Markets. Most importantly, membership rules must be enforced. Membership rules include, as described above, the ban of off-exchange trading and the provision of firm bids, i.e. members must be willing and able to execute those contracts which they offer. This might imply that members will have to deposit a certain amount of money and further security mechanisms. In the second place, a meta-activity must cover the operating of a price generating mechanism, generally called price clearing. If price-clearing is automated, the system must be supervised. There can be additional features which are quite essential to Electronic Markets such as matching business partners. However, this is only required if no true price generating mechanism is implemented since this implies that contracts are concluded in a centralised manner. Only if contracts are concluded bilaterally does a matching procedure make sense. If installed, however, a centralized matching procedure comes near to a true price-generating mechanism, since it offers one form of central market clearing. Third, classification and quality checking of traded products is necessary. Fourth, standardisation of contracts, which implies a continuous adaption to new business procedures and new products. Fifth, although not essential, mechanisms for transaction processing might be provided (such as financial clearing and handing over of products including risk sharing mechanisms).⁸

Let us finally discuss who will perform these meta-activities. For this purpose it is helpful to think of the meta-activities listed above as some form of centralised negotiating. At the beginning of this paper I took a look at different forms of electronically supported business

⁸ Quite frequently, participants in an Electronic Market will exchange bundles of products, selling them 'back and forth' as prices move. It would be an enormous obstacle if products had to be physically exchanged each time property rights were exchanged. Therefore, the operating of some sort of concurrent accounts might be essential for a functioning Electronic Market.

transactions. The brief analysis of these examples revealed big differences in the respective institutional framework within which each of these transactions occurred. I have now analysed the institutional background of Electronic Markets and found that there is a number of activities which must be performed if Electronic Markets are to function at all. Every single meta-activity has a counterpart in bilateral forms of negotiating. The establishment and enforcement of membership rules correspond to bilateral trust-relationships while the operating of a price mechanism, that is, the matching of business partners, including quality control and product classification as well as standardisation of contracts, correspond to negotiating bilateral contracts. Thus, if we consider the negotiation process as built up from many basic bits of distinct activities, we can identify a number of these bits of activities which are shifted away from the partners of a bilateral business to a central agency. This process of centralizing negotiation activities can be a gradual one. A sequence of different forms of negotiation patterns is represented in figure 5.

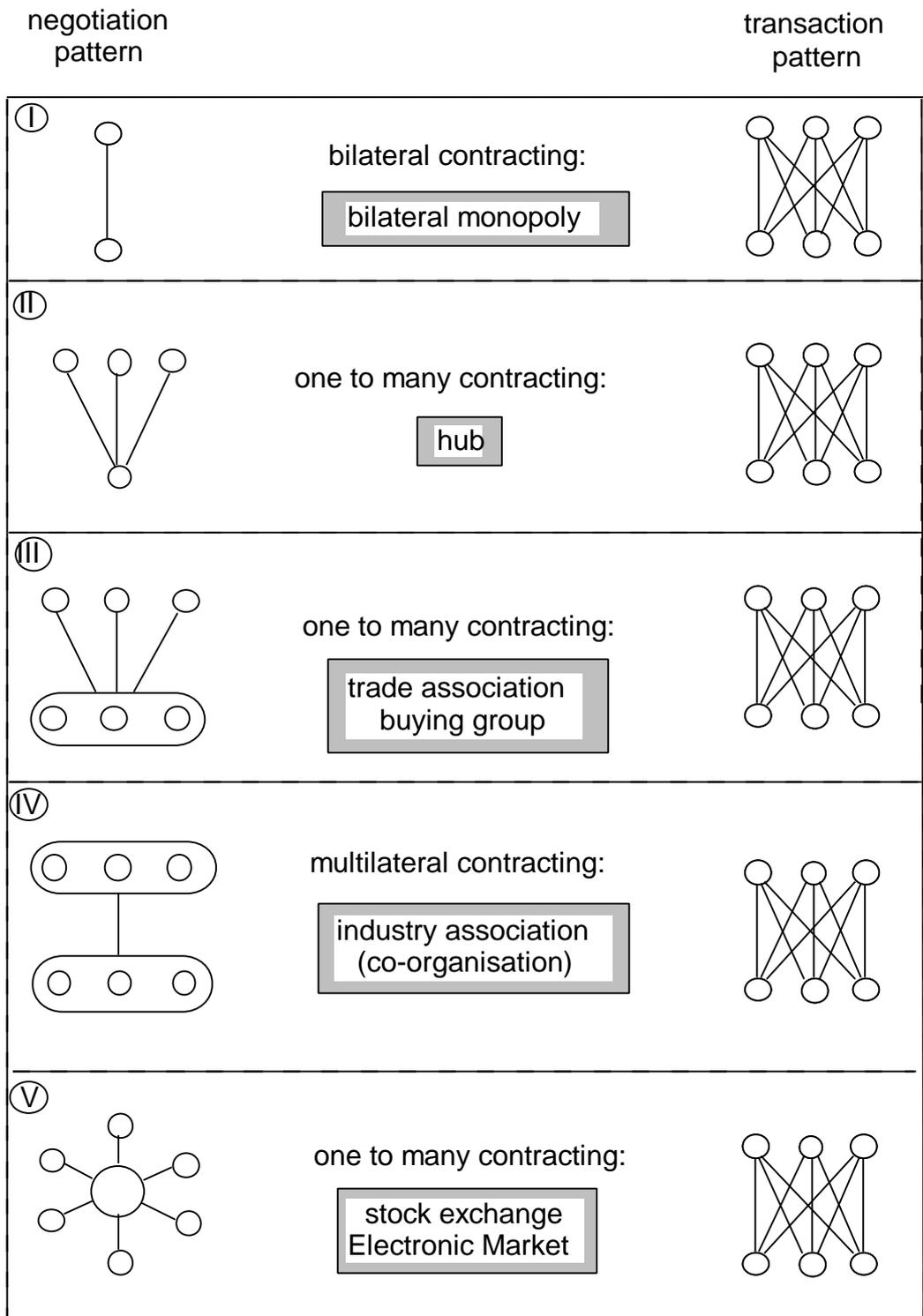


Figure 5: The centralisation of negotiation activities and the emergence of generative regimes

The same transaction pattern underlies any one of the five different negotiation patterns, namely, trading between any one of three sellers and any one of three buyers. The details of a contract (that is the lower levels of all three dimensions of each business' institutional regime) can be specified in bilateral negotiation processes, for example in the consumer goods industries. If one party is powerful enough it may be able to dictate its terms of business to several business partners simultaneously, for example in the automotive industry (hub and

spokes model). Also, several business partners might coalesce in order to gain enough negotiation power to dictate terms of business. A trade association, for example, may formulate general terms and conditions which automatically become part of every contract any one of its members concludes, or a purchasing agency may conclude general contracts with manufacturers on behalf of its members to achieve better prices. As a reaction the other party to the trade might form a coalition as well. One example of this negotiation pattern is the negotiation of the European Article Number between the trade associations of consumer goods manufacturers and the organisation of food chains and department stores (see Kubicek and Seeger 1992). Finally, the negotiation of terms of business can be centralised in such a way that direct negotiation between business partners is eliminated as in the case of stock markets and other organised markets such as futures exchanges (and, as we have seen, Electronic Markets).

By definition, any organisation carrying out meta-activities is called a generative regime. What I mean by this term is simply that there must be an organisation generating the institutional regime. By default, the generative regime is the state. However, in modern economies, there is a large variety of organisations which contribute to the institutional regime, ranging from consumer organisations to standardisation organisations and from trade associations to chambers of commerce. If we consider our examples of negotiation patterns, in cases I and II, no additional organisations emerge. Most activities specifying the institutional regime of the business (the governance structures as Williamson (1987) would term it) are carried out by the transaction partners themselves. However, in cases III-V, new organisations emerge, doing part of the job of negotiating the terms of business. The question is, why? Put in economic terms, what are the incentives for these organisations to come into existence? I do not want to delve into the political economics of trade associations and the like. However, it seems crucial to the understanding of the emergence of Electronic Markets to know what the incentives for a 'central negotiator' could be. Mulherin, Netter and Overdahl (1991) argue that stock exchanges can be viewed as firms whose products are prices. Thus, in order for them to exist, it is necessary to establish "property rights to price quotes" (*ibid.*, p. 592). They demonstrate in great detail, how the New York Stock Exchange (NYSE) and the Chicago Board of Trade (CBOT) evolved parallelly to the establishment of property rights to price quotes. One big issue in the history of these exchanges is the impact of the telegraph on their development. The telegraph technology made it possible to use price quotes of the NYSE at the CBOT for trading purposes without implementing an extra price-generating mechanism (and carrying the costs of it). Accordingly, they comment on the Congress plan to establish a National Market System through "communication and data processing facilities" (*ibid.*, p. 627): "... the proponents of the National Market System beg the question of who will pay for the technology to link exchanges." (*ibid.*, p. 633).

I do not want to forecast the development of the National Market System as well. However, this discussion demonstrates that Electronic Markets cannot be assumed to be provided freely. Instead, there must be actors regarding it worth their while to engage in the establishment of an Electronic Market. Up to now, most stock exchanges, for example, have been reluctant to integrate (*ibid.*, p. 636). This might cause some authors to think of them as monopolies which try to defend their privileges. However, if one regards stock exchanges as firms, it is clear that they will compete. On the contrary, their integration would result in a big monopoly. Similarly, Electronic Markets would emerge in several places simultaneously and initially be unwilling to

merge. Only as competitive pressure increases they would integrate horizontally, probably forming a national market. Thus, I agree with Schmid (1993), that Electronic Markets are (or better, can be) open systems technologically (ibid., p. 470). However, there are serious non-technical reasons, why traditionally increasing computerised exchanges are unwilling to integrate horizontally, forming a "global, open stock exchange" (ibid.). I termed these non-technical barriers to the emergence of Electronic Markets their non-market preconditions. The discussion in this paper has made clear that I do not expect these to disappear in the future.

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The Configuration of Inter-organisational Relations

Stefan Klein

Abstract

Based on recent literature on the impact of IOS on industrial organisation, this paper proposes a research framework that comprises (1) market structure, (2) governance forms, (3) relationship dimensions and (4) enterprise resources. It is suggested that these four elements at the same time affect and are affected by the coordination strategy which focuses on inter-organisational relations. The research proposition is that inter-organisational relations have to be interpreted as complex, multi-layer configurations of organisational parameters. The arrangement and flexible adaptation of these configurations - rather than the selection of one efficient governance form - and the related design of inter-organisational information systems (IOS) are the major goals of coordination strategy. The design parameters are related to the elements of the framework: (1) the position of the enterprise in inter-organisational relations, be it a network, groups of networks or markets (2) combinations of governance forms with different partners similar to the mixed-mode hypothesis, (3) combinations of governance forms within a given network of relations referring to the different layers in inter organisational relations, namely the institutional, the operational and the technical layer and (4) combinations of proprietary, shared and pooled resources.

Two modes of application of the research framework - the descriptive mode and the design mode - are illustrated. The case of EUROSELECT shows how different contingencies affect the inter-organisational design and why a complex configuration of relations is chosen. The CIL (computer integrated logistics) reference model is introduced to argue how IOS can be designed as platforms to enable a flexible configuration of different governance forms, switching easily from one to another.

The impact of IOS on governance structures

While there is a long tradition of research on the organisational impact of intra-organisational IS, the development and proliferation of inter-organisational information systems (IOS) has brought forward a separate stream of literature. IOS affect dimensions like the boundaries of firms, inter-organisational division of labour as well as decisions about governance structures and industrial organisation.

A literature review

The dominant research question in this literature concerns the impact of IOS on governance decisions: do IOS foster a trend towards (electronic) markets, (electronic) hierarchies or (electronic) networks as hybrid or intermediary forms of governance? Institutional economics, especially transaction costs economics, provides the theoretical foundation for most of the authors.

The proposition: From electronic hierarchies to electronic markets!

"... the result of reducing coordination costs without changing anything else should be an increase in the proportion of economic activity coordinated by markets." (Malone et al. 1988, 591)

In an influential article (written under the auspices of the MIT's *Management in the 1990s* Research Program) Malone et.al. (1988) hypothesise the influence of emerging information and communication technologies on the execution and coordination of economic transactions. Their claim is that IT will increasingly be used to coordinate economic activities and will consequently increase the share of market coordination over hierarchical coordination. Their argument is based on the analytic framework of transaction cost theory which compares relative production and coordination costs of markets and hierarchies: As IT reduces coordination (and information) costs, market transactions become more attractive. Adding more detail to their argument, they focus on asset specificity and complexity of product description as transaction features, which determine the choice of coordination mechanism. If both are high, hierarchical coordination is most efficient; if both are low, market coordination is preferable.

Malone et.al. argue for two trajectories towards electronic markets, one based on biased information systems which have become economically feasible through the emergence of IT, the second based on an electronic hierarchy where standardisation opens the system up for competitive pressure. There are different starting points as far as the functional scope and organisational setting of the systems are concerned, but competitive pressure and to some degree governmental regulation sustain the shift towards electronic markets in both cases.

Ebers (1992, 2) follows up on the transaction cost line of argument and tries to fill some voids of the theory, namely the choice of asset specificity and the interdependency among transactions. His hypothesis - in nuce - is that the extended scale (the frequency of transactions and the number of participants) and scope (diversity of transactions) of electronic transactions reduce the optimal asset specificity of investments and hence explain the development path from electronic hierarchies towards electronic markets via these two trajectories.

The rebuttal: Move to the middle!

"This hypothesis states that the lower cost and better monitoring capability of IT and the lower relationship specificity of IT investments will cause firms to engage in a greater degree of outsourcing; moreover, this increased outsourcing will be from a reduced set of suppliers with whom the firm has long-term cooperative relationships." (Clemons; Reddi 1993, 809)

The 'shift to the market' hypothesis has recently been challenged by Clemons and Reddi (1993, 810), who - again based on transaction cost theorising and a limited amount of empirical evidence - propose the 'move to the middle' hypothesis. The move to the middle is a double move: away from the hierarchical vertically integrated organisation to a higher degree of outsourcing and at the same time away from faceless market relations towards a situation where the firm relies on a few co-operative partners. The first part of the move towards outsourcing is based on a reasoning similar to Malone et al. (1988): IT lowers transaction costs, the costs of coordination and monitoring, and the relationship specificity of IT investments, and hence makes outsourcing an advantageous option. The role of IT in this process is to at least partly offset exogenous factors that usually increase transaction costs, such as relationship-specific investments, small numbers bargaining, demand uncertainty etc. The second part of the argument, however, gives reasons why companies increasingly choose

long-term cooperative relationships instead of market relationships: long-term relationships provide higher incentives to invest in IT and in the requisite organisational adaptations and learning processes (Seidmann; Wang 1992). At the same time long-term relationships provide some protection against the risks of opportunistic behaviour and especially the loss of critical resources (Clemons; Row 1992, 646-648).

In order to explain which conditions favour a 'move to the middle' vs. a 'move to the market' Clemons and Reddi (1994) propose a model of three variables that affect the price and the transactions risk.. These variables are product complexity and the variability of product prices over time and among suppliers (a), the reducing relationship-specificity (b) and the increasing cost-effectiveness of IT (c). If both, the price and the transaction risk, are low, a partnership solution is most likely; if the transactions risk is low but the price risk is high, market transactions are more efficient.

Bakos and Brynjolfsson (1993) focus on the phenomenon of increasing outsourcing and challenge the hypothesis of an increasing number of suppliers, based on the assumption that IT reduces search and coordination costs. Empirical findings show that firms in many industries are reducing the number of their suppliers. Their explanation is, that although coordination costs are decreasing, this effect is often offset by an increasing demand for quality. As quality and non-contractible actions of suppliers become more important, the buyer has to provide incentives for the supplier to invest in underlying relationship specific assets. A limited number of suppliers is such an incentive as it increases the bargaining power of the supplier and reduces the risk of buyer defection. Their argument is that the salience of non-contractible dimensions of a supplier-buyer relationship determines the optimal number of suppliers. The buyer relinquishes part of his power in order to create an incentive for the supplier to invest in the relationship. It is a balancing act of control over gains from investments and quality improvements. Non-contractible properties of the relation are dealt with through contracts concerning the exclusiveness of the relation and a barter of power concerning the division of revenues. What we see is a growing reliance on (specific) institutional arrangements to provide the right balance of interests in the area of non-contractible and intangible aspects of inter-firm relationships.

The synthesis: Mixed-mode hypothesis

"In essence, Information Systems enable organisations to do what they want much more efficiently and flexibly." (Holland; Lockett 1994, 409)

Holland and Lockett (1994) propose what may be described as the 'anything goes' hypothesis, stating that whatever governance form a firm chooses, IT will improve its efficiency. In response to the primarily transaction cost oriented approaches, Holland and Lockett (1994) have extended the theoretical framework and have included business marketing, manufacturing strategy and organisational behaviour literature. Based on these literatures they propose - instead of a contextual determinism - a research framework for the coordination strategy the 'mixed mode hypothesis': firms typically develop different forms of market and hierarchical relationships that are maintained simultaneously. The interrelation and interdependencies of governance structure, asset specificity, market complexity and coordination strategy are analysed in order to explain inter-organisational arrangements. Holland and Lockett (1994, 410-413) use five cases to illustrate different examples of vertical relationships on a continuum

from a high level of organisational integration and hierarchy to fragmented business relationships and a market system of trade. The patterns of IOS impact that become visible suggest that IOS are used to accentuate the effects of the chosen governance structure. In hierarchical relationships IOS are designed to foster the organisational integration, in market relationships IOS reduce information and transaction costs and facilitate the ease of switching among several suppliers.

A Configuration Framework

While there is a strong trend in the current literature to argue in terms of economic logic, like "the contingencies of the economic rationale determine the selection of governance forms", Holland and Lockett (1994) have emphasised the role of strategic calculations and have given empirical evidence that usually companies do not go for an either/or decision but design mixed-mode forms of governance. We propose that strategic management should be augmented by coordination strategy, which covers the different aspects of the design and maintenance of inter-organisational arrangements. Coordination strategy comprehends governance decisions as well as decisions about the design of IOS. It is recognised, however, that the concept of the firm is changing as firm boundaries become increasingly blurred. While the firm is regarded as the unit of decision making and strategic consideration, the boundaries of the firm themselves may become subject of the coordination strategy. On the other hand, new forms of collective strategies, e.g. in cooperative networks are emerging, which suggests that inter-organisational arrangements in themselves may become units of strategy building.

Like any other strategy, coordination strategy has to take restrictions and contingencies into account. At the same time strategy is not only re-active and adaptive but also actively shaping its own environment, i.e. the (potential) impact of strategy has to be considered. In order to depict coordination strategy rationale, we will discuss the duality of contingencies and impact of coordination strategy. Given the plurality of inter-organisational arrangements and the multiplicity of inter-organisational relations, we propose a research framework that comprehends elements that at the same time affect and are affected by coordination strategy (see figure 1, the arrows indicate contingencies and impact of coordination strategy):

- (1) market and industry structure,
- (2). governance structures,
- (3) transaction and relationship attributes, and the
- (4) resources base.

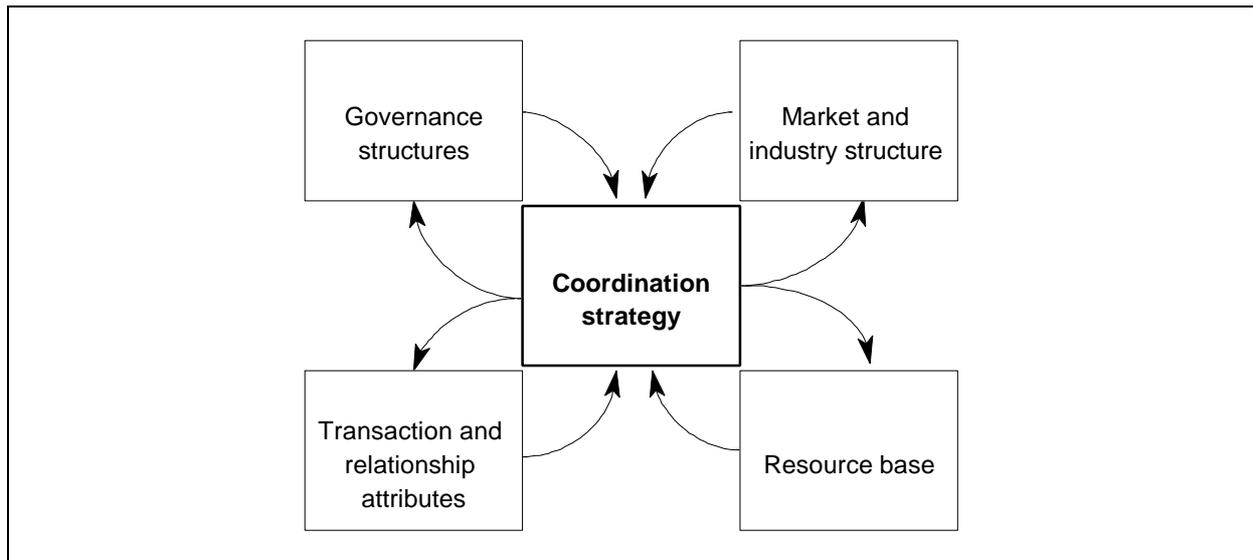


Figure 1: Research framework

Each of these elements encompasses options for strategic design such as the position of a firm in a network, the selection of governance forms in relation to different business partners, the shaping of different layers of inter-organisational relationships and the choice of forms of resource usage and development. 'Configuration' refers to the arrangement of complex combinations of design options in relation to the four elements of the framework. The research proposition is that inter-organisational relations have to be interpreted as complex, multi-layer configurations of organisational parameters.

In addition to the literature used by Holland and Lockett, this framework encompasses socio-economics and resource-based strategy literature. Borner (1986) has proposed a framework that combines resource-based and transaction specific factors, suggesting that both can be regarded as complementary. He distinguishes between (1) firm-specific skills and competencies, (2) transaction specific factors that are related to different forms of transactions and coordination (scope), and (3) country specific factors and locational decisions (profile) that affect the strategy of competitiveness.

Contingencies, impact and options for a coordination strategy

Coordination strategy is at the same time responding to contingencies of the framework elements and affecting these very elements by the design of inter-organisational arrangements and IOSs in particular. The description of the framework elements and the analysis of their interdependencies covers three steps. The initial step summarises contingencies of market and governance structure, of transaction attributes and the resource base on the coordination strategy. The second step focuses the reverse impact of coordination decisions on these four elements. Finally different options for the configuration of inter-organisational relations are distinguished.

The concept of configuration alludes to Mintzberg's (1979) work, who has emphasised the salience of an internal fit within organisations rather than a permanent adaptation to environmental changes. While Mintzberg focused on idealtypic organisational forms in his early work (1979) he later (1991) expanded his argument to combinations of forces that characterise organisations. This later notion is used here to describe combinations of motives and arrangements in the inter-organisational field.

The hypothesis is that firms form multiple, multi-layer relationships with different partners and groups of companies in order to sustain their competitive position. While in relatively stable industries new inter-organisational arrangements are emerging slowly, Ciborra (1994) has developed the concept of a platform organisation, based on a thorough analysis of Olivetti.

"The most characteristic quality of the platform organization is its flexibility, movement and transformation obtained from the intersecting, penetrating and collating of different organizational arrangements, such as network, the matrix and even hierarchy." (Ciborra 1994, 98)

The design and flexible adaptation of these configurations - rather than the selection of one efficient governance form - is a major goal of coordination strategy. The design parameters are encompassed by the elements of the framework: (1) the position of the enterprise in inter organisational relations, be it a network, groups of networks or markets, (2) combinations of governance forms with different partners similar to the mixed-mode hypothesis, (3) combinations of governance forms within a given network of relations referring to the different layers in inter organisational relations, namely the institutional, the operational and the technical layer, and (4) combinations of proprietary, shared and pooled resources.

Market and industry structure

Market and industry structure define the fundamental setting of a business: products and services as well as the structure and intensity of competition.

Contingencies

Market complexity, dynamics, uncertainty, degree of concentration and dominance are the most frequently quoted structural features of markets and industries that affect governance decisions. Within specific product markets price and product volatility and the complexity of product descriptions are the most important determinants.

Impact of the coordination strategy

Governance forms like mergers and acquisitions or other forms of vertical integration are chosen in order to improve the relative market position of the firm. By the same token the design and initiation of inter-organisational arrangements like cooperative networks affects the market position of the participants. The introduction of IOS can fundamentally change the market structure, especially if it is combined with a change of the governance structure like the establishment of an electronic market where previously hierarchical structures have dominated. If IOS are deployed within given governance structures, they affect attributes like the transparency and volatility of markets or the standardisation of products.

Configuration options

The configuration options on this level refer to different aspects of a firm's position, within the market, possibly within networks and the position of the network in relation to other networks (Gomes-Casseres 1994). The position of a firm can be described in terms of the definition of its business and its role in complex value chains.

Governance structure

The governance structure refers to different types of institutional arrangements between firms. Major inter-organisational coordination forms are market, hierarchy or network.

Contingencies

Governance regimes, i.e. existing patterns of inter-organisational arrangements such as a high degree of concentration grocery retail industry, influence governance decisions. Within various sectors a trend to adopt dominant governance forms - so called isomorphism - has been observed (DiMaggio; Powell 1991).

When firms are part of existing and successful networks within an industry, individual firm's decisions are determined by these networks. It is increasingly difficult to compete against groups of companies and with every competitor joining one of the existing networks, the scope of action becomes more and more restricted (Gomes-Casseres 1994). Tietz (1992, 53) coined the phrase contract-oriented market economy to describe this constellation.

Inter-organisational arrangements have their own dynamics that cannot be controlled by any single participating organisation but affects the participants' strategies.

Impact of the coordination strategy

The main task of coordination strategy is the selection of governance forms for various business relations. The sum of governance decisions of companies in a sector will have an impact on the governance regime. As Holland and Lockett (1994) have shown IOS have the potential to make chosen governance forms more efficient.

Configuration

The configuration options cover combinations of inter-organisational arrangements with different partners. Kambil and Short (1994) have used the roles and linkages model to describe the spectrum of options within a given business case.

Transaction and relationship attributes

While governance structure refers to institutional arrangements, the concrete design and patterns of relationships within these arrangements can vary considerably. We have e.g. distinguished different coordination and matching mechanisms - such as offer/accept, extended matching, and auction - within a market relationship (Alt et al. 1994).

Contingencies

Transaction cost theory hypothesises that the choice of governance forms is contingent on the transaction attributes, frequency, asset specificity and uncertainty of transactions (Williamson 1975). Further relational and related attributes have been proposed in the literature such as the continuums dependency - autonomy and opportunism - trust or centrality and integration of transactions, information complexity, defection risk, switching cost. Oliver (1990) has proposed a framework of determinants for the formation of inter-organisational relationships: necessity, asymmetry, i.e. the desire for autonomy and control, reciprocity, efficiency, stability and legitimacy.

Impact of the coordination strategy

Inter-organisational arrangements are designed and implemented in order to affect transaction attributes, e.g. inter-organisational networks reduce risks of opportunism and at the same time maintain some of the incentives of competition.

The design of IOS, in particular the degree of standardisation affects relationship attributes. Open systems reduce the asset specificity and related cost and risks such as switching costs and the risk of one-sided dependencies for the participants; they increase, however, the defection risk for the initiator of a system.

Configuration

Several different layers can be distinguished within the set-up of inter-organisational arrangements. (1) The institutional layer relates to boundaries of a network, to rules for participation and coordination forms. It refers to the specification of the governance form within a business relationship. (2) The operational layer deals with organisational integration and alignment of procedures. It encompasses e.g. the selection and combination of coordination mechanisms. (3) The technical layer refers to design parameters of the IOS, such as the intra-organisational integration of IOS application or IOS related governance decisions. In order to reduce risks, different arrangements can be maintained on the different layers, such as a market-like institutional arrangement combined with a hierarchical governance of the IOS.

Resource base

The resource-based paradigm of business strategy has focused on the individual competencies of firms and their development and maintenance. However, a resource-based rationale is also an important element of coordination strategy since competencies can be acquired and developed within inter-organisational arrangements. Within the context of the ongoing discussion about the impact of IT on industrial organisation, we will argue that the resource-based theory augments and partially complements the transaction cost focused theorising.

Contingencies

The relative resource position of a firm or of a group of firms (e.g. resources that are facilitated and enhanced by sharing) affects coordination strategy. Weder (1989, 117) has shown that a complementary resource position of firms favours the development of

cooperative coordination forms, in particular joint ventures. In times of volatile technological developments, the joint development of resources reduces the financial risks for the participants.

Impact of the coordination strategy

While the resource-based strategy literature focuses - with few exceptions - on the intra-organisational development and isolation of firm specific resources, inter-organisational arrangements are often chosen in order to get access to complementary resources or to pool resources and develop them within a network. Hamel (1991) has shown the potential of inter-partner learning.

IOS facilitate and accelerate the exchange of resources such as marketing or partner information and they provide a platform for resource sharing and pooling.

Configuration

Depending on the relative resource position and the quality of the resources, different strategies such as protecting, pooling, sharing or exchanging of resources can be chosen. Some of the resource strategies can be combined with different governance forms; details are presented in table 2.

	1 Core resources	2 Pooled resources	3 Shared or licensed resources	4 Outsourceable resources
Governance structure	Hierarchy	Network	Network - market	Network (outsourcing partnership) - market
Status of resource	Crucial for the identity of the company	Crucial part of services or products that cannot be achieved alone	Internal services that are offered externally, even to competitors, sufficient lead time	Areas that do not fall into the core business and where external suppliers hold a leading position
Assessment and reasoning	'Best in the world' capabilities can be developed and maintained alone	The company alone cannot become the 'best in the world' alone, but within the limits of a virtual corporation	Requisite scale cannot be achieved internally, competitive pressure utilised to improve quality of service	Careful planning is a prerequisite to avoid excessive dependence or even dominance by one partner

Table 2: Different type of resources and related arrangements

The following table summarises the three steps of configuration analysis in relation to the elements of the framework.

	Contingencies	Impact of Coordination Strategy	Configuration
Market and industry structure	Complexity, dynamics, uncertainty, degree of concentration and dominance, price and product volatility, complexity of product description	Design of inter-organisational arrangements in order to affect relative market position, IOS affects market attributes: transparency, volatility, standardisation of products	Different aspects of network position, defining the business and the governance structure (roles and linkages)
Governance structure	Isomorphism of governance forms, existing patterns of inter-organisational arrangements (governance regimes)	Choice of governance forms; IOS make chosen governance forms more efficient	Combinations of inter-organisational arrangements with different partners
Transaction attributes	Dependency - autonomy, centrality of transactions, asset specificity, defection risk, switching cost, opportunism - trust, information complexity	Inter-organisational arrangements affects transaction attributes, e.g. network reduces opportunism risk, IOS reduces switching costs	Set-up of the different layers within a relationship: institutional, operational, technical, intra-organisational integration of IOS application
Resource base	Relative resource position (e.g. resources that are facilitated and enhanced by sharing) affects coordination strategy	Inter-organisational arrangements affect the resource base, e.g. cooperation enhance learning	Different resource-based strategies (protect, pool, share, exchange resources) and related governance forms

Table 3: The three steps of analysis based on the coordination framework

Configuration Framework: Two modes of application

The EUROSELECT case is used to illustrate the interrelationships between contingencies, interorganizational design and patterns of configurations. The CIL (computer integrated logistics) reference model is introduced to show how IOS can be designed as platforms (Ciborra 1994) to enable a flexible configuration of different governance forms, switching easily from one to another. From a methodological point of view EUROSELECT depicts the descriptive use of the framework while the example of CIL shows its potential to support the design of inter-organisational systems.

The descriptive and analytical mode: EUROSELECT

"Multiorganization service alliances, or consortia, are groups of firms that band together to create a new entity to fill a need shared by all of them. They are generally limited in purpose, such as research and development, and offer the benefits of larger scale through resource pooling." Moss Kanter; Myers 1991, 332.

Common strategic goals are the basis of a cooperation among European grocery wholesalers, who combine competence, decentralised knowledge and business connections into an information partnership. Based on technology, the management of information becomes the pivotal competence of the wholesalers. The EUROSELECT network of national offices provides the organisational framework for an EDI based product/price catalogue and ordering system. This system has become an emerging information technology infrastructure to facilitate the virtual size, which is required to gain (information) economies of scale and to operate effectively in a unifying Europe (Klein; Kronen 1993).

Market and industry structure

Contingencies

While take-overs and cooperation among producers lead to a decreasing number of producers of the same articles, producers integrate forward by taking over distribution channels, thus enhancing the European concentration process in the industry (Gorter de Vries, van Leur 1991). A few large, international wholesalers increasingly dominate the market. In addition, supermarket chains, originally operating in their home country, have started to expand into other European countries, either by opening branches in other countries (e.g. Aldi, Tengelmann (Germany), Carrefour, Auchan (France)), or cooperating with chains in other countries (e.g. Rewe, Germany) (Zentes 1992).

Throughout the EU remarkable price differences exist among the different member countries, especially for a large number of basic goods, even between identical products supplied by different national branches of the same producer.

Impact of the coordination strategy

EUROSELECT intends to strengthen the position of the wholesalers. By means of establishing a peer network (horizontal cooperation), dependency on suppliers (vertical relation) is reduced in an indirect manner. Although wholesalers and suppliers do not meet directly but via other wholesalers, their relation is a major target of EUROSELECT.

The IOS facilitates representation and comparison of numerous products and it enables national partners to expand their procurement markets.

Configuration

The EUROSELECT central office is the hub of a procurement network that is strategically positioned to leverage the strengths of the participants in relation to competing retail chains and in relation to the producers.

Governance structure

Contingencies

At the time of the set-up of EUROSELECT there was no institutional framework for horizontal cooperation of voluntary chains in place. There is no market for procurement information (systems).

Impact of the coordination strategy

EUROSELECT provides a framework for cooperation among national partners (procurement cartel), and a second tier network of participating wholesalers. There is however no direct link to producers, but ordering is done via the national partners. The wholesalers intend to improve the links with their customers by providing a broader assortment of high quality products at reasonable prices.

EUROSELECT is an information logistics infrastructure that functions as a broker and coordination mechanism for the peer network of wholesalers.

Configuration

EUROSELECT combines information barter and a platform for order management among the national partners, with market relations towards suppliers and participating wholesalers. Participating wholesalers form a second tier network. They will get selected offers and can order via EUROSELECT. By this means the order volume is increased but at the same time internal competition in the network is limited.

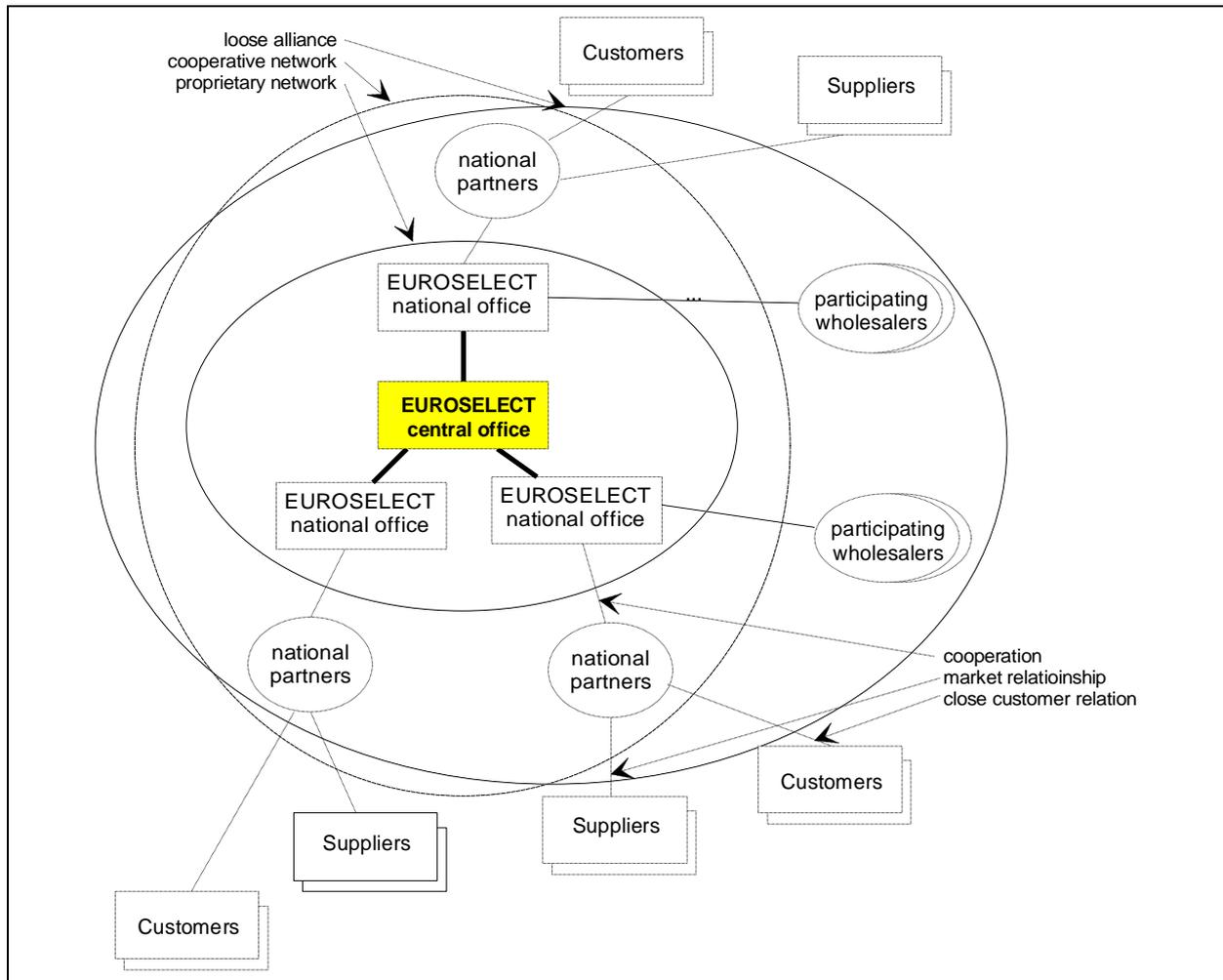


Figure 2: The configuration of relationships within EUROSELECT

Transaction attributes

Contingencies

Procurement is a core function for wholesalers. The price and quality uncertainty as well as defection risks affect the set-up and design of EUROSELECT.

Impact of the coordination strategy

As the national partners operate in different regional markets and cooperate only in part of their procurement activities, they retain a high level of independence, and there is only little competition between the national partners. In contrast to vertical cooperations, the division of labour between the participants is hardly affected, but the participants have the opportunity to partially outsource market research and administrative handling of procurement to EUROSELECT.

The EDI solution between the EUROSELECT offices and the national partners is based on EDIFACT messages; it therefore reduces switching time and cost. The uncertainty resulting mainly from the heterogeneous character of many of the products involved is reduced by means of a common product classification. Relationship specific assets are limited basically to organisational know-how.

Configuration

On the institutional level, EUROSELECT is a subsidiary of Van Eerd Holding (VEH) for information services. VEH can be called the hub of the network, it initiated EUROSELECT, it holds a dominant position with high centrality, and intends to keep a close hierarchical control over the system. The dominant position of VEH helps to avoid long discussions about procedures and especially technical arrangements, but it requires a high level of trustworthiness, reliability and neutrality on behalf of EUROSELECT.

Personal ties and a shared strategy have been the selection criteria for the partners. The selection of key partners (employees for the national offices, wholesalers who provide price information) secures or endangers the delicate balance of the social fabric of the network. And it proved to be a time-consuming and challenging task to align different interests and to bridge the gap between cultural differences. In every country there is only one partner in order to avoid conflicts of interest. EUROSELECT is essentially a closed user group in which wholesalers participate to strengthen their competitive position; the boundaries of the network are thoroughly maintained and only deliberately opened. The combination of a centrally controlled infrastructure and a cooperative network of autonomous partners ensures stability as well as flexibility.

On an operational level, the organisational procedures for price quotations have been harmonised. The financial responsibility for EUROSELECT gives VEH access to operational profits which are shared with those wholesalers whose offers have been accepted.

As the costs for a proprietary solution of an procurement information system were too high, VEH decided to *make and share* the system with peer organisations in other European states. This caused comparatively little risk of supporting (potential) competitors but had the main advantage of sharing costs, at the same time securing economies of scale and the necessary input of information. The selection of EDIFACT messages was an incentive for partners to join but poses at the same time a considerable defection risk.

EUROSELECT is a hybrid solution: On the one hand it resembles an electronic marketplace in its function with a focus on price and product information. The infrastructure, on the other

hand, is governed hierarchically in order to protect critical resources on behalf of Van Eerd and reduce the defection risk.

Resource base

Contingencies

The idea of EUROSELECT depends on the input from the national bureaus and - most of all - their national partners. The efficiency of their intelligence operations, the extension of their business connections to suppliers and their assessment of offers (in combination with the central office's judgement based on specific knowledge for the classification and evaluation of products) determine largely the attractiveness of EUROSELECT.

Impact of the coordination strategy

The cooperative arrangement has two effects on the resource position of participants (1) individual market knowledge is enhanced through exchange, (2) organisational routines are harmonised in order to improve efficiency.

Configuration

EUROSELECT combines Van Eerd's proprietary product classification know-how and pooled sourcing information.

The main impact of the arrangement is the extended virtual size for the participating organisations which gives them leverage towards competitors and suppliers and yields benefits for their customers. The horizontal network is carefully positioned within a highly concentrated market. Information technology provides the backbone to handle the size and the extension of the network efficiently.

A rough analysis of the configuration of EUROSELECT, of the fit among the different functional components, reveals an imbalance or tension between the hub-spoke governance structure and the cooperative spirit of the arrangement. This imbalance or inconsistency within the arrangement is a potential source of conflict among the participants. However, for the time being the advantages of being a member of EUROSELECT outweigh the objections against the governance structure at this level.

The design mode: Computer-integrated logistics services

Current research at the Competence Centre Electronic Markets focuses on the design of a platform for electronic coordination in the logistics sector. Computer-integrated logistics (CIL) has been conceptualised as an IOS or information logistics platform for the integration of distributed, multi-modal transport services on the one hand and for the integration of financial and administrative services (e.g. customs, insurance) on the other. The main function of CIL is the informational representation of the entire logistics process and chain, covering all phases of business transactions (information, settlement and execution). Within a distributed environment, CIL shall facilitate different coordination forms and mechanisms between the various players, e.g. market-like transactions with insurers within a hierarchical relation with a

freight forwarder. The application of the research framework in this area exhibits its potential as a design tool.

The discussion of CIL maintains two perspectives, on the one hand CIL is going to become an integrated part of the logistics operations and is thus discussed in terms of strategic impact on the business, on the other hand CIL as information service of VANS is a business in itself and has to be strategically positioned.

The analysis shows design options and strategic deliberations. It is, however, not intended to suggest a normative design.

Market and industry structure

Contingencies

Within the European logistics sector a trend towards increasing concentration can be observed. Different regulations and cost-structures within the EU and neighbouring countries, especially Eastern Europe, have led to intense price competition. Global sourcing and distribution concepts turn logistics more and more into a global network business with growing demands on service quality. Both trends enhance the requisite size for global logistics companies. Two growth trajectories can be observed: firstly, growth through acquisitions and the establishment of regional subsidiaries; secondly, growth through strategic alliances in order to gain virtual size without bearing the risks and costs of entering new markets.

Within the freight forwarder market, product standardisation is very limited. Some players however are starting to design standardised service components that can be combined by the customer.

While there is an increasing number of IS and IOS in the logistics sector (Alt; Cathomen 1995), most of them are fragmented and focused on small segments of the logistics business.

Impact of the coordination strategy

An open, multi-player platform for information logistics will affect the service level in the industry and will provide a platform for the integration and harmonisation of products. The development of DanzLink, an EDI solution for exporters in Switzerland, underscores the advantages of an open platform that facilitates an accelerated diffusion among the senders and establishes a standard for operations with other players like customs as well (Handschin 1993). Both are preconditions for significant and swift productivity gains.

Configuration

Improved productivity and service quality is crucial for freight forwarders to maintain their position in relation to integrators like Federal Express or United Parcel Services that have built a high level of information and logistics services within the realm of a hierarchical governance form.

The challenge for a CIL-IOS is the integration of existing networks and services such as Cargo Community Systems and to provide additional functions like tracing and tracking in order to stay ahead of competing systems.

Governance structure

Contingencies

Within the logistics sector there is a (limited) tradition of cooperation. As logistics is a network business, external services have to be contracted frequently. Trade associations provide a forum for necessary harmonisation of paper work and interfaces within the industry.

Impact of the coordination strategy

CIL facilitates flexible combinations of governance forms. Based on an infrastructure of EDI services and databases for shipment information, services can be contracted in various ways, e.g. transport services can be provided by own subsidiaries (hierarchy), they can be provided by an alliance partner (network) or they can be contracted via the market, perhaps even an electronic market. A current example for the combination of different governance forms within an IOS is the Swiss freight bourse which functions as an electronic market, but its infrastructure can also be used by closed user groups (Serna 1994).

Configuration

The main players in logistics processes are manufacturers, consignees, logistics service companies, transport companies, shipping agents, port terminal operators, port authorities, customs, banks and insurance companies. CIL covers communication and transactions among these players and enables different combinations of roles and links, i.e. governance forms and coordination mechanisms.

Transaction attributes

Contingencies

Information logistics becomes a core function for logistics companies

for the production of their services and internal coordination,
for the marketing purposes, in the double sense of electronic media as marketing channels and information logistics competence as a marketing argument, and
for customer service in order to provide transparency over the logistics process and to get requisite information from the manufacturers (sender) as soon as possible (Sekita 1990).

Impact of the coordination strategy

CIL provides an open communication platform based on standardised communication formats that reduces asset specificity and switching costs. Ebers (1992) has argued in detail the effects of EDI and IOS on transaction attributes.

Configuration

On an institutional level the boundaries of CIL have to be decided: it has to be determined whether to cover the entire logistics industry or segments thereof and also who is going to provide information and communication services. There are valid arguments for an intermediary to provide these services because of a steep learning curve and economies of scale (Bakos 1987). However, anecdotal evidence about electronic markets in the logistics sector shows that they often run into problems because of political quarrels among the logistics players.

On an operational level, CIL incorporates different governance mechanisms like offer/accept, extended matching or auctions that can be combined depending on the organisational arrangements and the situation of the market (Klein; Langenohl 1994).

The communication links among the different players provide a basis for cooperation and further integration of activities where ever the type of transactions requires that. The option to switch to other governance forms and to other partners maintains the requisite competitive pressure.

On a technical level, the scope of support by the intermediary has to be decided.

Resource base

Contingencies

Established technical competencies and a high quality of service enable companies to go for a broad information logistics infrastructure.

Impact of the coordination strategy

A freight forwarder who is actively involved in setting up a information logistics infrastructure not only improves its own technical and organisational competencies and its productivity. It can also expand its competencies and reach for further organisational integration or backward integration with manufacturers and other customers. Although the technology is open and can be used by the competitors as well, the level of competition is defined at an organisational rather than at a technical level.

Configuration

A freight forwarder who is actively using and aligning its business to CIL has to manage a portfolio of different resources. There are a few proprietary resources like specific organisational competencies or the design of the network of operations. Organisational knowledge and customer information can be shared and pooled with alliance partners in order to provide a high and homogeneous level of service for the customers. Then there are common procedures, product codes, messages that have to be developed in the industry and which are in themselves no source for competitive advantage. A fourth group of resources are those that can be temporarily or permanently contracted out to service suppliers such as VANS who have superior competence and/or a different size of operations.

Conclusions and propositions

A framework for the analysis and design of coordination strategies, which are focused on organisational and technical arrangements on an inter-organisational level, has been proposed. The analytical and - to a limited degree - the normative potential of the framework have been illustrated. The following propositions summarize the underlying assumptions and future areas of research:

- (1) Governance decisions reflect a complex, multi-dimensional set of contingencies that encompass market, industry, inter-organisational and firm related factors. At the same time it has become evident, that the coordination strategy is directed at affecting some of the contingencies and at changing the firms' competitive position.
- (2) Governance decisions and decisions about the design of IOS are closely interrelated and together constitute the coordination strategy. However, complementary arrangements can be chosen in order to combine the benefits of more open, market-like arrangements and more restricted, controlled hierarchical arrangements.
- (3) Rather than a singular decision or a simple choice among alternatives, coordination strategy faces a complex set of interrelated configuration options. IOS not only make existing governance forms more efficient, they also - and even more importantly - facilitate changes and combinations of governance forms that make firms more flexible and more fluid.

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Participation of intended users during development - extending the concept to the context of inter-organisational systems

Angèle Cavaye

Abstract

Use of IOS has become widespread but relatively little has been written about the process of IOS development. The underlying assumption of this paper is that it is important to identify techniques and tools which might enhance successful IOS development and this is addressed by focusing on one particular development practice: participation of intended users during development. Although participation is a recognised practice in the development of internal systems, empirical evidence shows that the practice is not common during the development of IOS.

This paper identifies participation of intended users as a development practice which can enhance IOS implementation success; participation is also described as a means of enhancing inter-organisational cooperation. A method incorporating participation is outlined and guidelines for practice are presented. While it is felt that participation is of value at any time, it is recognised that under certain circumstances participation may be particularly desirable or may be facilitated. Such contingencies for participation are identified and described.

Introduction

Literature focusing on inter organisational systems addresses opportunities for IOS development, costs and benefits associated with IOS use, governance issues concerning IOS, and possible IOS network structures. Surprisingly little attention has been paid to the development process of IOS or the concepts which can enhance successful development. In view of the important nature of an IOS it would seem appropriate to carefully consider the development process so as to ensure, as far as possible, that the developed system will be a success. And yet, very little information is available about IOS development methodologies or about techniques and practices to facilitate successful development.

There may be several reasons why IOS development has not received much attention in the literature. It could be argued that in the past one could not discuss development of IOS as distinct from development of internal systems because many IOS were originally internal systems. Many IOS have developed gradually out of internal systems and have not often been developed solely and specially as an IOS (e.g. Runge, 1985; Reich and Benbasat, 1990). The development of the IOS then is the development of an internal system with some interface additions to give the system inter organisational functionality. The focus during inter-organisational 'development' of such systems is on issues related to telecommunications (i.e. exchange formats and standards), not on traditional system development issues.

A second possible explanation for the lack of literature on IOS development concerns the generic nature of the system development process. Whether developing internal or inter organisational systems, the development process in each case is similar: every time system opportunities must be identified, a system must be designed, the system must be developed and built, and the completed system must be implemented.

However, now organisations are developing applications particularly aimed at inter organisational information transfer (e.g. Cash and Konsynski, 1985; Malone et al, 1988). Focusing on the improvement in speed and accuracy of data transfer between organisations, systems are designed to support that inter organisational process. Also, in some industries rationalisation of existing IOS networks requires organisations to rethink and redesign their existing IOS. Now there is a new generation of IOS. Usually these IOS are linked into internal systems but they no longer haphazardly evolve from internal systems and instead are purposefully designed for inter organisational purposes.

The context of developing systems aimed at inter organisational links is very different from that when developing internal systems. When developing an internal system an organisation has relatively easy access to all information required and has complete control over implementation of the system. All the knowledge about the process to be automated is held within the boundaries of the organisation; the people and interest groups who may be affected by the new system are all members of the organisation; if a new system is not welcomed by users, management can insist upon its use (although this does not necessarily ensure successful implementation; eg Markus, 1983). When developing an IOS, the initiating organisation holds only part of the necessary information and does not have control over implementation. The processes meant to be automated run across the organisational boundary; the parties at whom the system is aimed are outside the organisation; the initiating organisation can not always enforce IOS use by intended users.

In short, it is possible and also desirable to discuss IOS development as distinct from internal system development. The inter organisational context of IOS complicates development and implementation, and as such success of these systems is never guaranteed. It is therefore important to identify techniques and tools which might enhance successful development. This paper addresses this issue by focusing on one particular practice: participation of intended users during IOS development.

This is a speculative paper which delves into the context of participation in IOS development, putting the use of IOS and the practice of participation during IOS development in the broader context of cooperation between organisations. The paper proceeds as follows. First, participation is identified as a way of enhancing implementation success of IOS and is then described against the background of co-operation among trading partners. Then, theoretical and empirical evidence concerning participation in IOS development is briefly reviewed. Next, a method and some guidelines for participation during the IOS development process are introduced. In the final section contingencies for participation are discussed.

Enhancing implementation of IOS and participation in development

Implementation of IOS and system uptake by intended users is not necessarily easy and successful. It is only once the IOS is perceived by intended users to be an essential service or tool, that use of that IOS becomes widespread. The uptake of reservation system terminals by travel agents in the 1970s is a good example of IOS adopted quickly because users understood the benefits and demanded a system of that kind. American Airlines offered their Sabre system to travel agents in the middle of 1976; they aimed to have 200 travel agents on-line in 2 years,

but the system was so much in demand that their target of 200 users was already reached after 11 months (Copeland and McKenney, 1988).

However, only few IOS are quickly recognised by potential users as important and essential to business operations. Reasons for slow and difficult implementation of IOS are manifold. Reasons include suspicion of the technology, a lack of awareness of potential benefits of IOS use, the lack of network externalities, the cost of acquiring/maintaining the system, the apparent lack of benefits for small and medium-sized firms, and the reluctance to become dependent on a trading partner (Cavaye, forthcoming). A full discussion of such implementation problems is outside the scope of this paper. We focus here on ways to overcome such implementation barriers.

There are a number of measures and practices which organisations can employ to enhance implementation. Some of these are used *after* a system has been developed, at a time when the IOS is ready to be offered to potential users. It is also possible to take a *proactive* stance towards facilitating implementation and encouraging adoption of the IOS by users. By seeking participation of intended users during the development process, the opportunity is created to consider potential implementation problems *before* the IOS has been built.

Reactive measures to enhance implementation

There are several ways of addressing implementation problems when the IOS is ready to be offered to the market.

Compulsory use of IOS. One way of ensuring adoption of the IOS in spite of resistance or disappointing uptake of the system, is to force or coerce potential users to adopt the system. A powerful player in the industry or a regulating body can impose a system on the market and make use of the system a necessity to compete in the industry.

The London Stock Exchange is an example of a mandatory electronic market where all transactions occur electronically and where use of the trading system is a prerequisite to trade in the market. There are many other examples of IOS where use is not mandatory, but where users are put under such pressure to adopt the IOS that use of the system is, in effect, compulsory. A major customer can force its suppliers to trade electronically and make electronic information transfer a condition of trading. Similarly a major supplier, particularly of brand name non-substitutable goods, can insist on use of IOS to carry out transactions.

Marketing of IOS. Compulsory use of IOS may not be appropriate or possible. If an organisation is not in a powerful position, it may try but will not be able to impose IOS use on others in the market. Also, if the potential user base is largely ignorant of the technological opportunities, any attempt to impose a system can easily backfire. Instead of insisting on IOS use, organisations may have to wait for potential users to voluntarily adopt the system.

In order to stimulate uptake of the IOS the sponsoring organisation can actively market the system. A marketing effort may be aimed at educating users in technology in general, in use of the specific system and in the business potential to be derived from IOS use. Adoption of the IOS can be encouraged by offering special discounts on products or services ordered through

the system, by providing free software or/and hardware, by offering free updates and maintenance of the system or by using other methods to attract potential users.

Wait and see. Marketing of the IOS is not necessarily an option for a sponsoring organisation. The department which has to implement the IOS may not have the appropriate knowledge to market the system and may not have the resources to train and maintain a group of employees dedicated to marketing the IOS. The systems or marketing department of the sponsoring organisation may get involved in other projects which are considered of greater priority than the IOS. Even if the resources and knowledge are available, an organisation may decide that it should concentrate on its core business and not focus on tangential activities like promoting IOS use.

Instead, the organisation may be forced to sit back and wait to see how implementation of the system develops. The sponsoring organisation then relies on word of mouth advertising of the system, hoping that peer group contact will spread knowledge of the system and stimulate among potential users the inclination to use the IOS.

User participation in IOS development

Apart from post-development action to enhance implementation, an initiating organisation can also pro-actively address the problem of building a system for use by outside organisations: participation of those outside organisations can be sought during development of the IOS.

The concept of user participation in the IOS context is by no means clearly defined. The first ambiguity concerns the term 'user': does it refer generally to an organisation or to individuals in that organisation and, in any case, which individuals are the users? The second vague term is 'participation': what is meant by participation in development?

The user of an IOS can be defined in two ways: users are particular *organisations* in the IOS target group and users are *individuals* in those organisations who have a decision-making, managerial or an operational interest in the IOS. When talking about participation of users in development, we think of participation by individuals from organisations in the IOS target group.

It is usually not possible to include individuals from all potential user organisations as participants in a development project. Instead a sub-group of organisations is normally selected to act as representatives of the user organisations.

It is often unclear who is the individual user to be involved in participation. Implementation of an IOS involves much more than the technical development of an information system. The decision to implement and use such a system is a strategic one: it involves a different way of doing business and changes the trading relationship between organisations. As such, *senior management* needs to be involved, initially in a decision-making and later in a committed, supporting role. *Line management*, responsible for the content and output of their employees' work as well as for the work-environment and well-being of their employees, is appropriate throughout the development process. The *clerical and administrative staff* that will interact directly with the IOS on an operational level comprise the hands-on type of user of the system.

Their jobs and work-environment will be most affected by the new system and therefore their input is important to obtain information requirements and user interface preferences.

Participation of intended users during development of a system refers to the practice of involving users in activities during the development process (Barki and Hartwick, 1989). Such participation should not just take place at the testing stage. Instead, participation should allow users to help shape the system by collaborating during the problem definition phase and the specification phase of development.

Participation in the IOS context then involves gathering together representatives of user organisations (i.e. various organisations in the target group) before starting actual development and seeking active involvement of different levels of user individuals during the development process. In this way the IOS is developed with input and (hopefully) with the consensus of intended users which, if carried out correctly, should ensure that the concept and the final design of the IOS take account of various interests.

The rationale for seeking participation in IOS development

Participation is aimed at building a system which is acceptable to intended users and takes account of user needs. When the IOS addresses intended users' needs and interests, the system is likely to be accepted - not only by the users who participated by also those who did not individually participate in the development process. In this way, participation by user representatives facilitates implementation of IOS and is likely to encourage adoption and use of the system by intended user organisations.

While the argument in favour of participation is compelling, there are also arguments against participation. One of those is that IOS are novel and offer new opportunities, that the systems are so new to users that the users can not know what they need and can not express what they would like from the system. However, Brown (1991) counters that this should not be a reason to avoid participation but is exactly the reason to seek participation from outside users. While discussing the development of innovative products and systems, he argues that participation is particularly important when systems do not yet exist or when those systems are to address as yet undefined needs. By involving intended users in the development process latent needs surface and systems can be customised to meet those needs. In addition, participation of users during development of a novel system enables users to become aware of the benefits of implementing the IOS

Another argument against participation is that different organisations pursue their own self-interest and that it may be difficult to achieve full co-operation from various parties (Bakos, 1991). However, by encouraging participation an organisation can be seen to want to co-operate with other parties. Also, the participation effort itself can make interests of various parties explicit. Once the wish to co-operate is apparent and the various interests are clearly expressed, participation can be used to try and achieve consensus on the concept of the system to be developed.

Participation has a real potential to be able to alleviate implementation problems by addressing obstacles head-on *before* development of the IOS is complete.

Co-operation and participation in IOS development

The previous section focused on the function of participation in enhancing implementation and on the potential effect of creating a 'better', 'less controversial', 'more acceptable' IOS than might be developed without input from intended users. This section focuses on participation as an expression of co-operation between and among organisations.

Strategic management literature has for some time already explained how during the past 20 years there has been an increasing move towards co-operation within groups of trading partners (e.g. Jarillo, 1988; Gomes-Casseres, 1994). Use of IOS facilitates existing co-operation between organisations and also enables new forms of co-operation. Participation during development, similarly, can reflect existing co-operative relationship or can be a platform for creating new collaborative relationships with trading partners.

Co-operation between organisations and use of IOS can be categorised in several ways. For the purpose of this paper we focus on the direction of co-operation and on the initiator's attitude towards co-operation. Co-operation can take place between similar, competing organisations within an industry (horizontal co-operation) or between organisations in a supplier-customer relationship (vertical co-operation). Similarly, IOS are designed to support or manipulate a horizontal or a vertical relationship. Participation during development can thus take place between players who are horizontally or vertically connected in a business relationship.

In terms of the initiator's approach to co-operation, co-operation can be mutually beneficial (collaborative) or can be a function of power play by one partner in the relationship (coercive). IOS can support or create a collaborative or a coercive relationship between trading partners.

Vertical and horizontal co-operation

IOS relationships between organisations can be categorised according to the type of link between the partners: these links can be vertical (as between suppliers and customers) or horizontal (between competing entities). The first type represents relationships in a value chain; the second includes networks with a specific purpose which link competitors in a market.

IOS enables close vertical trading links between an organisation and its suppliers or customers (Konsynski and McFarlan, 1990; Normann and Ramirez, 1993). These links are value chain partnerships which are usually the closest and strongest kind of relationship between partners (Moss Kanter, 1994): commitments are high and operations often overlap. The IOS crystallises and strengthens existing relationships to create a mutual dependency between supplier and customer which can be of benefit to both.

IOS also encourages horizontal co-operation. Co-operation between horizontal partners is particularly relevant when the co-operation is focused on technology and systems (Jorde and Teece, 1989) which tend to demand large investment and specialised knowledge. Initially in an industry-sector individual organisations may compete not only on their product/service but also on their IOS; in that case an initiator IOS or an innovative follower IOS can offer a competitive advantage to its sponsor organisation.

However, most industries can not sustain a large number of different, competing IOS: there are pressures from intended users as well as from providers themselves to move towards collaborative arrangements. Firstly, intended users who do not wish to become totally linked into one provider/supplier, pressurise providers to offer a common system. Secondly, maintaining and updating the IOS to keep it competitive may become too expensive for individual providers to keep up and hence individual providers may need to seek co-operation with other providers. Also, co-operation among competitors can be a way of keeping potential competitors out of the market by presenting a strong, united front against new entrants.

It often does not make sense and it may not be desirable to divert resources away from the core business to set up, maintain and update an IOS. By sharing IOS costs with other providers or passing the IOS over to a third party, individual organisations can concentrate on competing on the basis of their core business. A second incentive for individual organisations to work co-operatively concerns uncertainty over technical standards. Often the outcome of discussions on standards is likely to depend on the number of organisations using particular standards. Since IOS depend on standards organisations band together to create a critical mass of users of one standard system. Thirdly, the importance of being able to offer a system on a large scale also encourages the growth of co-operation. Organisations would like to provide access to their system to as many potential users as possible and therefore may co-operate with organisations of complementary systems or with an umbrella organisation that provides all players in the market. Networks of horizontal partners thus arise. Such networks are collections of separate companies linked through collaborative agreements focused on providing a combined or compatible IOS.

The 'vertical' and 'horizontal' IOS relationships can be seen as two poles of a continuum with a number of mixed arrangements existing as well. EDI connections between Volvo and its parts suppliers are clearly vertical IOS links and joint ATM networks of banks are clearly horizontal links. But electronic markets which link multiple suppliers with multiple customers (like, for instance, the London Stock Exchange) are a mixed IOS arrangement with aspects of horizontal as well as vertical connections with trading partners.

Collaborative and coercive relationships

In coercive relationships powerful partners pursue their own interests with little regard for its effect on the minority partner(s). In this kind of relationship one powerful player imposes use of the IOS on its suppliers or customers. Powerful organisations can demand that their suppliers adopt a system by making use of the IOS a condition of doing business. Often such IOS are based on proprietary standards which underlines the one-sided and political use of the system in the power relationship with partners.

In collaborative relationships the relationship is pursued by two or more partners for mutual benefit. Inter-organisational relationships do not need to be based solely on competition and antagonistic relations; there is also room for co-operative relationships based on goal congruence and trust (Jarillo, 1988). Strategic management literature in the past few years has shown that the most successful partnerships are of this latter type: collaborative and mutually beneficial (Moss Kanter, 1994).

IOS relationships between organisations can be characterised according to the nature of co-operation between the partners: co-operation can take place under duress (as a result of coercive action by a powerful partner) or can be collaborative and for mutual benefit. IOS which are developed collaboratively, which include participation during the development process and which take into account the interests of all major interest groups are likely to lead to close, agreeable partnerships. Similarly, IOS which are developed solely or largely by an initiator or sponsor, with the interests of the sponsor in mind and excluding participation by intended users are likely to lead to problems during IOS implementation or to discomfort and unease among users who feel coerced into use of the IOS.

'Coercive' and 'collaborative' relationships are two extremes, but mixed modes of co-operation are also possible. Some systems are clearly coercive; others have clearly been developed while taking account of all different potential users. As an example of a mixed arrangement, the same IOS may be perceived as a collaborative system for some users and coercive for others: large potential participants may have been involved during development and may consider the IOS as an extension of a collaborative relationship; small organisations may feel forced to use of the same IOS while their voice was not heard during development and while their interest is not served by the system.

The practice of participation

There is very little existing research specifically dealing with the practice of participation during IOS development. There are some references to participation in theoretical and empirical IOS papers. Johnston and Vitale (1988, p158) claim that "it is critical to involve people from other organisations in the resolution of functionality and human engineering issues for those subsystems that impact their organisations. ... Involving users slows the design but pays off during implementation." Reich and Huff (1991, p36) add that IOS targeted at outsiders should be designed with intended user input in order to receive early feedback on the practicality of the system and in order to obtain reference points for the marketing program which accompanies implementation.

Very few studies throw any light on the actual practice of participation during the IOS development process. There is some empirical evidence concerning the incidence of participation and concerning the link between participation and IOS success.

Incidence of participation during IOS development

Common sense would suggest (and empirical evidence confirms this) that intended users participate during the testing phase of IOS development. In most cases intended users are approached for beta-testing and user input is then used to make final adjustments to an IOS application. Although such involvement does constitute activity of intended users during development, it is not the kind of participation that helps shape the concept and form of an IOS. The kind of participation that is required during IOS development is the involvement of intended users during the early, formative stages of development (Johnston and Vitale, 1988): during the system definition phase and during the phase where requirements are specified.

When defining participation in this more narrow (but at the same time more meaningful) way, empirical evidence shows that participation in IOS development is not a common occurrence. Runge (1985) looked at 35 IOS in the United Kingdom and reports only 12 of those as having been developed with input from outside users. Reich and Benbasat (1990) report on a study of 11 IOS in Canada and found that only 3 of those systems were developed with participation of intended users. Cavaye (1993, 1994) studied 9 New Zealand systems and reported that only in 4 cases intended users were involved during IOS development.

The link between participation and system success

Theoretically the benefits of participation seem clear, but in practice there is mixed evidence concerning the outcome of participation and its links with success. It has been known for more than a decade that user participation in internal systems does not necessarily lead to more successful systems (e.g. Ives and Olson, 1984; Pettigrew et al, 1988). In IOS the link between participation and success is also unclear. On the one hand, when 'success' is defined in terms of enhanced co-operation between organisations, then results are positive. The one consistent (intangible) benefit associated with participation is close links between participants and initiator. Similarly, IOS use is consistently tied with closer co-operation and tighter trading partnerships.

On the other hand, if 'success' is defined in terms of successful implementation (fast and widespread adoption and use of the IOS), then results are mixed. Empirical studies have shown that IOS developed without participation have mixed adoption rates and are often adopted slowly (Runge, 1985; Reich and Benbasat, 1990; Cavaye, 1993). As for IOS developed with participation, Runge (1985) reports that 11 of his 12 participation cases enjoyed fast adoption; Reich and Benbasat (1990) report that all their 3 participation cases were adopted quickly; Cavaye (1993) found mixed results: 2 cases were adopted quickly and 2 slowly.

Some authors (Ives and Olson, 1984; Doll and Torkzadeh, 1988; Barki and Hartwick, 1989) have suggested that methodological issues account for the inconsistent findings concerning the link between participation and success: studies use different definitions of participation and of success, use different instruments, study different types of systems. Any of these lead to a lack of comparable results. However, the IOS studies that investigated participation all used the same definition, employed a similar instrument and studied the same type of system (though in different countries). So, inconsistency in methodology can not fully account for differences in results of the IOS studies.

A second reason explaining the inconsistent results for participation outcome concerns the political nature of the process. The development process takes place over time and involves interaction between developers and users as well as interaction between different user interest groups. Part of all that interaction is likely to include political manoeuvring (e.g. Newman and Noble, 1990; Robey et al; 1989) and hence participation, although nominally taking place, may not be very effective. However, in IOS the political aspect of participation does not impinge on the development process to the same extent. Participants are members of separate organisations. They are consciously invited to participate and would not be invited if the initiator meant to manipulate proceedings. Also, participants can not be forced to participate

and work on a system that they do not agree with; if they felt coerced, they would no longer participate. So, the political argument can not completely explain inconsistent results when linking participation and success in the IOS studies.

Thirdly, researchers have commented on the nebulous nature of the concept of participation itself. There are many attributes of participation, all with various possible values, leading to a large number of different types of participation. Participation in practice can take any form and not every type of participation is necessarily linked directly and positively with system success. This is a problem for participation in the development of any kind of system, whether internal or inter organisational. The differences in individual instances of participation in various IOS development processes may go a good way towards explaining inconsistent participation-success results.

The link between participation and system success has not been proven beyond doubt. Still, in spite of a lack of consistent and positive results, it seems premature to conclude that there is no benefit to be gained from seeking participation of intended users during IOS development. The IOS evidence relates to three case-research based studies. Due to the low number of studies (three) and the method used in each study (case research), the studies together do not offer sufficient data to enable generalisation concerning the participation-IOS success link. Further studies to provide more evidence might help come to a conclusive outcome. In addition, variability in the types of actual participation in each case may explain at least some of the inconsistency among present finding. Accounting for this variability might also help come towards convergence in study results.

In theory, the link between a desired type of participation and participation outcome is obvious and positive. In practice, participation does not form part of every IOS development effort. There is empirical evidence which indicates that an absence of participation is associated with slow adoption and less successful implementation of IOS. Participation when it does take place, is not necessarily very effective: there is some, but no conclusive evidence that participation in IOS development may improve the likelihood of successful implementation.

We must conclude that there is room for improvement in the practice of participation during IOS development. For that reason the following section presents a method and some guidelines to suggest how participation may be incorporated in the IOS development process.

Developing IOS with participation from intended users

There are two reasons for developing an IOS with participation of intended users. Firstly, the initiating organisation may seek to enhance implementation success by incorporating intended users' advice when building the IOS. Secondly, the initiating organisation may wish to co-operate in a meaningful way by extending co-operation with trading partners to collaborative development of an IOS. Whatever the reason for seeking participation, that participation must be sought very early on. The nature of the actual IOS to be created depends to a large extent on the concept that is developed during the very early stages of development. Those who participate during the conceptualisation and definition stages thus determine the nature and the shape of the particular system to be developed. If an initiator wants the IOS to appeal to a

particular set of users (Brown, 1991; Wierda, 1991) or wants to truly collaborate with trading partners (Jorde and Teece, 1988; Moss Kanter, 1994), then it is important to ensure that those users and trading partners take part in *defining the concept* of the system.

A development method including participation

The development process of IOS includes the same stages as the development process of any other system: an opportunity must be identified, requirements for the system must be specified, the system must be designed and built and, lastly, the system must be implemented. Participation can not be sought before a possibility for a system has been identified by an initiator, but as soon as that has happened and before any further steps are taken to begin actual development of the system, input from intended users can be sought.

Figure 1 shows the major stages of IOS development, separately identifying a phase for gathering participants in the development process and a phase for conceptualising the IOS (based on Wierda, 1992). These two phases are next described in further detail.

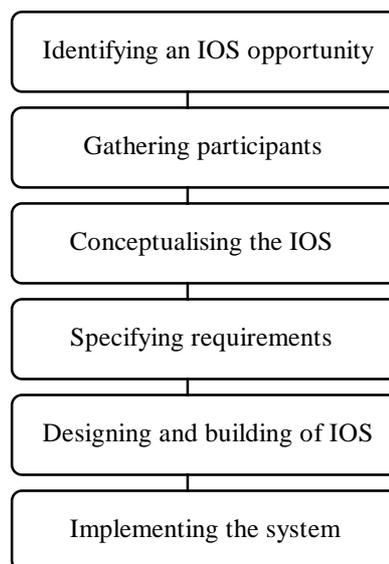


Figure 1 - Stages in the IOS development process

Gathering participants. This development stage aims to bring together the initiator and representatives of various outside interest groups. Collecting participants with the purpose of discussing and developing an IOS, involves both the initiating organisation and the potential participant organisation(s) in several tasks.

Once the initiator has identified a possible IOS opportunity, the initiating organisation determines global IOS concepts which enhance the performance of the organisation. This paints possible IOS scenes from the initiator's point of view. Based on the kind of system that the initiator has in mind, criteria are determined which will help select potential participants. These participants will belong to one or more of the categories supplier, customer, competitor, network provider, and other institutions. Having identified potential participants, individual

organisations are approached with an invitation to discuss opportunities to enhance mutual exchange of information and to enhance the mutual business relationship.

The participant also goes through a preparation process before joining the development effort. The moment when the participant is contacted by the initiator, is likely to be the first time that the participant seriously considers implementation and use of the IOS. Participants then first consider the potential and the impact of the IOS on their own operations and then evaluate whether it is worthwhile to participate in development. A very important point of discussion for each participant concerns each organisation's own goals and strategies. The concept of an IOS will have to fit into that strategic picture and will have to hold out the promise of enhancing the performance of the participant. A major consideration is the trading relationship with the initiator of the IOS: the participant may not wish to risk losing an important customer or supplier. Only once a potential participant organisation are clear in their own mind about the value and use of the IOS, is the participant ready to take part in the development effort.

When a sufficient number and variety of participants has agreed to join development, the initiator can consider this development stage to be completed successfully and can turn to the following stage.

Conceptualising the IOS. The goal of this stage of development is to reach sufficient consensus among participants concerning the IOS concept to justify continuation of the development effort.

Some parties may regard an IOS development as a threat to their organisation; others may consider it a good business opportunity. In order to enable the building of an acceptable and workable IOS, viewpoints of potential participants ideally should converge. In reality there is not likely to be an ideal scenario; after all, organisations more often than not have conflicting goals, interests, viewpoints and cultures. However, it may be possible to meet the different goals from different organisations through common functionality of an IOS. There may be mutual benefit to be gained from development and implementation of an IOS. Attempts must be made to reach a degree of consensus concerning the concept and functionality of the IOS.

If consensus can not be reached, the initiating organisation has to decide whether to develop the system anyway, knowing that one or more group(s) of potential participants do not support the IOS concept. The initiator can decide to go ahead anyway, thus forcing the others to decide whether they can risk being left behind. Alternatively, the initiator may decide to abandon the opportunity and not to pursue development of the IOS.

It is also possible that discussion with potential users leads to a consensus opinion that there is no good reason to develop an IOS; in that case too, the initiator may abandon the development opportunity without moving further in the development process.

If, on completing the conceptualising stage, the initiator decides to continue development, then the subsequent development phases must be completed. Specifications for the IOS are drawn up; intended users can participate by helping draw up detailed requirements and by being given sign-off responsibility. Then the IOS is physically designed and built; participants may contribute to this phase of the development effort, particularly when a prototyping method is

used. Testing and early implementation of the system can take place at participant sites. When the IOS is offered for widespread use, participants can serve as valuable reference points for potential new users.

Incorporating participation in IOS development in this way participants are given a prominent and active development role. A crucial aspect of participation in IOS development is that participants are to be included in the development process very early on. Development of the IOS thus becomes a collaborative process aimed at building a system which offers mutual benefits.

Guidelines for participation

The above presents a general method for incorporating participation in IOS development. This sub-section fills in some of the details which concern identifying participating organisations, selecting participating individuals and employing a desirable form of participation.

Seeking participation at the right stage of development. The development stage at which participants become involved defines the scope of that participation. It is essential that participants are included in the development effort at the 'right' time (e.g. Ginzberg, 1981; Wierda, 1992).

The initiator holds the key to the moment of participation since the initiator can invite participation at any stage in the development process. Participation can be sought for testing, for interface design, for prototyping, for identifying requirements before actual building; this list of participation activities refers to participation in the technical design of the IOS. Although this is important, the benefits from participation may be most clearly felt when involving intended users in *defining the concept* of the IOS. The initiator has one view of the desirable IOS environment; intended users may have different views. For implementation to be successful these different views ideally should converge: individual organisations may have different goals in mind, but the system itself should offer benefits to all parties. Discussion can be used to try and reach some degree of consensus on the nature and desirability of the IOS to be built. Through participation there is a sense of moving towards a mutual benefit solution and this enhances the likelihood of support for the IOS and enhances the relationships among the organisations participating in the development process.

Selecting the right participating organisations. Selection of participating organisations is a strategic matter since participants have a decisive influence on the type of system that will be created. It is important that the initiator selects participants which are 'right': organisations that can contribute to and that can potentially enhance the development effort (Wierda, 1992).

There are *many different possible criteria* for selecting participating organisations. One may decide to select large partners, aiming the IOS at major trading partners. One may select partners who already know about or have experience with IOS, so as to build on that experience and learn from it. The initiator may choose to approach partners who are able to raise funds so that they can share development costs or so that they can finance modification of their own systems. The initiating organisation can also decide to go for partners with whom a good co-operative relationship already exists, so that development of the IOS is likely to take

place in harmony and so that the development effort may strengthen existing co-operation. There may be any number of further criteria. Whichever one (or more) of these are chosen, remains something to be decided by the initiator. Identifying criteria and selecting participants is a subjective, strategic decision.

Inviting the right individuals from the participating organisations. Initially in the participation process the concept of the IOS and the nature of inter organisational (i.e. strategic) relationships is discussed. It is therefore vital that individuals of a senior level in participating organisations take part in that early discussion (Hirschheim, 1985; Jarvenpaa and Ives, 1991).

The IOS concept would need to gain support from *senior management* in organisations. It is senior management that would be able to foresee the consequences of the IOS for the operations and performance of their organisations. Also, senior management would have to agree to the financial cost and to the operational change associated with implementation of the IOS in their organisation. In addition, senior management are in a position to encourage or, if necessary, coerce their employees to accept and use the IOS when it is implemented.

After the first, conceptual stages of development, other users from the participant organisations should get involved in the process. Middle management, hands-on users and even more technical, IS personnel are then the appropriate individuals to contribute in a collaborative development process.

Ensure the right kind of participation. The nebulous nature of the participation concept suggests that there are more and also less effective kinds of participation. It would seem important to ensure that efforts are made to ensure that a desirable kind of participation takes place (e.g. Ives and Olson, 1984).

Participants can contribute in an advisory or sign-off capacity or can be full members of the development team. A purely advisory function may not be sufficient to ensure that the participants' voice is truly heard and therefore sign-off responsibility is recommended. The content of participation effort should include not only the technical design of the IOS but also (and especially) the conceptual design of the system. In terms of influence, participation of intended users should be taken seriously and their input may not be ignored. When participants from outside the organisation sense that their input is not appreciated and not considered, then participation is likely to be short-lived and ineffective.

Participation contingencies

Although participation is of value in any development context, it is prudent to note that there are situations where participation is potentially more important while there are other situations where participation has potentially less to contribute to development. In addition, in practice there are contingencies that tend to inhibit or facilitate participation. Each of these two groups of contingencies are discussed in this section.

Contingencies that make participation more or less pertinent

This set of contingencies identifies conditions where there is a greater or lesser apparent need for participation of intended users in the IOS development effort.

Intended use of the system. Systems which are to be imposed on users and use of which is compulsory, do not require participation of users during development to improve the system: whatever the outcome of the system development effort, users will be forced to use the system. Although mandatory systems do not need participation, they can benefit from participation anyway. Participation enhances user understanding, acceptance and commitment to the system and can thus smooth the implementation stage of development. Systems which rely on voluntary adoption and use can benefit greatly from participation (Barki and Hartwick, 1994). Systems are not likely to be adopted and used if they do not fulfil user needs, if users do not understand their benefits, or if they are not easy to use. Since participation can address each of these issues, intended users can potentially add great value to the development effort, particularly when system use of voluntary.

Extent of regulation. When the processes to be addressed by the IOS are highly regulated and standardised, then IOS development is relatively structured and straightforward. In that case IOS development is concerned with the automation of existing, well-defined procedures which does not necessarily require involvement of intended users to define the system concept or to define specific requirements (Schonberger, 1980; Ives and Olson, 1984). Alternatively, systems can also be aimed at automating less structured processes and systems can significantly change existing processes. In these situations participation of intended users can aid the development process and facilitate implementation of the proposed system.

Number of interest groups. When developing a system for a specific interest group it is possible that the system initiator can oversee and anticipate the needs of that group without requiring any specific input from that group during development of the IOS. In contrast, when there are a large number of potential interest groups it is more difficult for the system initiator to intuitively understand the needs and requirements of all different groups. Failing to take account of the needs of the users may well lead to failure of the system at time of implementation. This situation can be avoided by reducing the scope of the system and aiming the system at a particular market-niche or initially focusing on supplying the needs of a particular interest group only. Alternatively, the problem may be addressed by consultation with representatives of all potential interest groups early on in the development process and by seeking participation of representatives during development of the IOS.

The contingencies showing a greater or lesser need for participation during IOS development are presented in Table 1.

Contingencies	low	high
intended use of system	mandatory	voluntary
extent of regulation	great	low
number of interest groups	low	great

Table 1 - Potential importance of participation in IOS development

The table shows that there are circumstances where there may be less need for participation to enable development of an IOS than in other circumstances. However, although in those cases participation may not necessarily be required, participation is still desirable. Mandatory systems, systems with a high degree of structuredness, and systems with a low number of potential interest groups can still benefit from participation. After all, participation enhances user understanding, acceptance and commitment to the system; as such participation can smooth the implementation stage of development. In addition, seeking participation, especially when not strictly necessary, demonstrates the initiator's wish for a collaborative and positive relationship with partners and this could enhance the overall trading relationship.

Contingencies that inhibit or facilitate participation

There are a number of factors that are known to inhibit participation in the development of any system. Those factors include lack of time (participation is known to increase the amount of time required for development; Locke and Schweiger, 1979); lack of funds (participation increases the cost of development by lengthening development time and increasing requirements; Locke and Schweiger, 1979). These factors will not be discussed here; instead we focus on the factors which are specific to the IOS context.

Power distribution among participants. In many trading situations there are dominant players; this can happen in vertical relationships and in horizontal relationships. In vertical relationships a supplier is in a dominant position when a customer strongly depends on that particular supplier for goods and services; a customer can be in a dominant position when a supplier depends on that customer for the majority of his turnover. In horizontal relationships one player may be larger than others or may hold a dominant share of the market. The fact that there is a dominant player need not affect participation, but it often does. When the dominant player is in a position of power, participation can become a highly political process. Dominant players tend to use power and influence to ensure that their own interests are served; minority players respond by manipulating the development process in an effort to get their interests met as well (e.g. Newman and Noble, 1990; Robey et al, 1989). When the dominant player is the system initiator, participation from other players may not even be sought.

Nature of the market. The intended user market may be closed and have a known set of users or user groups; alternatively the market may be open and have an undefined number or set of users. In a closed group different (groups of) users are known and clearly defined; in an open group the different users may not be clearly identifiable. When different groups of users can not be clearly identified, it is difficult for the IOS initiator to invite participation from those users. In contrast, when different users or groups of users are easily distinguished then seeking participation from users is facilitated.

Number of potential interest groups. When the number of potential interest groups increases, a participation effort becomes more difficult to co-ordinate and consensus is less likely to be achieved in a short period of time (Locke and Schweiger, 1979). Hence, the context of an IOS aimed at several user groups whose interests may conflict is not conducive to participation in

development. Foreseeing difficult discussions and time-delays, the initiator of such an IOS may prefer to develop a system without participation hoping to create a norm or standard which other participants then accept and use. Alternatively, participation during development of an IOS with a focused user group would create less difficulty for the initiator which makes the seeking of participation of intended users more likely.

Number of competing systems. In industry sectors there may at any one time be one, few or many competing, similar IOS. When there is no competitor or when there are only few competing systems, an IOS initiator may not feel forced to seek participation of intended users. Early IOS were often developed without participation while initiators were convinced that their application had competitive value and that therefore development of the IOS should be confidential. On the other hand, when many IOS flood the industry, participation of users in (re-)development of the IOS is encouraged. Participation then is likely on two counts: the initiator will need to be sure that the new system is competitive compared to others and that it accurately meets market needs. Secondly, the initiator may seek rationalisation among competing IOS and may invite participation from sponsors of other IOS in order to discuss possibilities for a common, shared IOS.

World view of initiator. Many system development methodologies were and are based on functionalist assumptions aiming at efficiency and effectiveness. A functionalist view of systems espouses the practice of involving users during development as an important component of the process of building functionally correct and efficient systems. Participation is considered to be a means to an end. Participation of intended users is only sought if this is clearly necessary to enhance the system (Hirschheim and Klein, 1989). In contrast, in the neohumanist world view, participation is accorded a central role in the development effort. Rather than placing the system at the centre of the development effort, the people and the potential users of the system are then considered the most important component in the information system. When the initiator embraces a neohumanist world view, participation of intended users becomes the default and the norm (Hirschheim and Klein, 1994).

Design method. In many design methodologies participation is nominally considered to be desirable, but remains optional: the manager of the development team must consciously decide to and take steps to involve users before any participation takes place. The default, therefore, is that a system is developed without participation from intended users. In a few design methodologies (for instance, ETHICS) participation is mandatory making involvement of users always an integral part of the development process.

The factors impacting on participation in an IOS context are summarised in Table 2. The contingencies can be categorised as relating either to industrial context or to characteristics of the initiating organisation.

Contingency categories	Contingency factors	Inhibitor	Facilitator
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Industrial context	power distribution among participants	initiator is powerful player	no overt power difference between initiator and potential participants
	nature of market	open	closed
	number of potential interest groups	many	few
	number of competing systems	none/few	many
Initiator characteristics	world view of initiator	functionalist	neo-humanist
	design method	participation optional	participation mandatory

Table 2 - IOS contingencies inhibiting and facilitating participation

One of the factors in Table 2 also appeared in Table 1 (which showed factors indicating greater or lesser need for participation). It seems ironic that one of the situations where participation seems particularly necessary, is also a situation which tends to have an inhibiting effect on participation: IOS contexts with many different interest groups could benefit from including users during development and yet the sheer number and variety of different user groups works as an inhibitor on participation.

Conclusion

This paper has explored the concept of user participation during development of IOS. Participation in the IOS context is perhaps more complicated than participation in internal system development - after all, participants are separate and independent from the initiator. At the same time, participation in IOS development can be very rewarding since it enhances co-operation with trading partners and also potentially enhances implementation success.

There is little rigorous, empirical evidence concerning participation in IOS development. It appears that participation in IOS development is not common. Findings concerning the link between participation and IOS success are not conclusive, though there are strong indications that an absence of participation is associated with low success rates (particularly among voluntary systems).

It is clear that there is room for improvement in the incidence and in the quality of participation of intended users during the IOS development process. For that reason a method to specifically incorporate participation in IOS development (based on previous work by Wierda, 1992) was outlined and some guidelines for the practice of participation were presented. It was suggested that the main role for participation in IOS development relates to the joint definition of the IOS concept and concerns the building of consensus about the nature of the IOS to be built. The section concerning the method and guidelines may be a special interest to practitioners.

From a neo-humanist point of view there is value in participation during any development effort, but in practice there are many situations where participation may not seem necessary or

may be inhibited. Circumstances where participation is particularly desirable and also IOS conditions which inhibit or facilitate participation were identified.

This was an exploratory paper and clearly, much additional work still remains to be done in this area. Further research could be used to accumulate more evidence concerning incidence of participation and also concerning variability in type of participation in IOS development. Such evidence might provide further answers in the attempt to find out whether participation really does have a positive impact on successful implementation. Research studies could also investigate contingencies for participation in IOS development projects. A number of contingencies were identified, but empirical evidence about these contingencies is as yet not available. In addition, research could be directed towards the development of specific methods and techniques to aid the IOS development process. Such research could address participation of intended users in greater detail or might look at other, additional techniques which can enhance development and facilitate implementation of IOS.

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