

STRATEGIC ASPECTS OF OUTSOURCING

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Abstract

The increasing application of information and communication technology during the past two decades led to a lot of new concepts. One of these new concepts in information processing and communication (I&C) seems to be outsourcing. Outsourcing means that certain tasks and duties of the information management department are delegated to specialized service companies which are acting as outsourcing vendors. The paper deals with some strategic aspects of outsourcing like outsourcing reasons, economic impact of outsourcing, extension and intensity of outsourcing, choice of an outsourcing partner, relationships between outsourcing company and outsourcing partner, action models for outsourcing, advantages and disadvantages of outsourcing.

Povzetek

Povečanje uporabe informacijske in komunikacijske tehnologije v zadnjih desetletjih je imelo za posledico tudi mnoge nove pojme, med katerimi je tudi izločanje (outsourcing). Izločanje pomeni, da sektor za upravljanje z informacijsko tehnologijo prenese nekatere naloge in obveznosti na specializirana storitvena podjetja. Članek obravnava nekatere strateške vidike izločanja kot so razlogi, ekonomski učinki, širitev in intenzivnost izločanja, izbor poslovnega partnerja, odnosi med organizacijo in pogodbenim partnerjem, modeli obnašanja, prednosti in slabe strani izločanja.



1. What is outsourcing?

1.1 Introductory remarks

The development of information systems and communication during the past two decades is characterized by a sequence of innovations, which sometimes appeared intermittently. These innovations do not only take place in the field of hardware (computers, peripherals, networks etc.) but also in the architecture of information systems and organizational concepts. Typical examples for the latter are

- intercompany integrated information systems like *just-in-time-control*, *electronic cash systems* or *systems of electronic tele-diagnostic or tele-maintenance*,
- delegation of different but related tasks as a whole to a single employee by using integrated task and decision support systems instead of atomistic division of labour.

Another characteristic example is the dislocation of purchasing, processing, storing, transfer and presentation of information to independent service companies. This today is discussed as "outsourcing".

1.2 Definition of outsourcing

Even outsourcing is a new term, it is neither a new business activity nor an innovation of applied computer science. In general outsourcing means the use of external agents to perform one or more organizational activities, e. g. purchasing goods or services (cp. Lacity et al. (1993)). Under the headline *make or buy* this is discussed under various aspects in business economics (cp. e. g. Männel (1981)), usually with respect to efficiency of production, even though outsourcing may be applied to nearly every business or administration function.

Even outsourcing is a creation of *outside* and *resourcing*

which does not imply a restriction to I&C, the term *outsourcing* is only used to discuss the *make-or-buy*-problem with respect to purchasing, processing, storing, transfer and presentation of information.

But even in the I&C domain outsourcing is not a new approach, only a new term, because activities like those discussed as outsourcing, we will find some ten years ago. In the fifties and sixties in many branches companies were using the service centers of hardware suppliers, esp. IBM, for certain tasks of data processing, e. g. statistical evaluation of market analysis, turnover statistics or special tasks of book keeping.

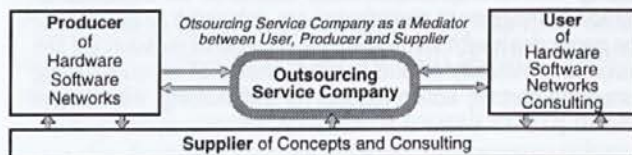
In literature we will find different definitions of outsourcing, e.g.:

- Outsourcing is the *delegation of facilities management*, i. e. the complete delegation of the data processing center and all tasks related to the data processing center, to an external service enterprise (cp. e. g. Heinrich (1992, pp. 21)).
- Outsourcing is the *medium- and long-term delegation of secondary functions*, esp. the I&C function, to an external partner (cp. e. g. Szyperski et al. (1993, p. 229)).
- Outsourcing means the use of an external, economically independent I&C service enterprise to perform I&C tasks which have been executed internal so far (Knolmayer (1993, p. 71)). This definition does not include outsourcing to an affiliated company as well as outsourcing of new I&C tasks. In this sense, facilities management is a part of outsourcing.

In the following we will use the term outsourcing for delegation of any type of I&C tasks to an external partner, i. e. we prefer a rather wide definition.

1.3 Business and economic impacts of outsourcing

The delegation of I&C tasks to an external, economically and/or legally independent I&C service company induces new business relations to a new partner or supplier. This new partner supplies certain I&C services and acts as a mediator between I&C user on one side and I&C suppliers of hardware, software, networks and consulting on the other side. This is illustrated in figure 1.



Figur 1. Outsourcing service company as a mediator between I&C user and I&C suppliers (cp. Szyperski et al. (1993, p. 230))

Obviously outsourcing will lead to deep and complex changes in the outsourcing company. In production, the buy or the make or buy decision affects certain steps or activities of production or, in many cases, is related to certain parts of a product. The buy-object can easily be separated and is not affecting other processes and activities. But in the I&C domain the outsourcing object often is an essential part of the companies I&C system (hardware, software etc.) and that means: of the control system. Thus the business impact and importance of outsourcing in the I&C domain mostly is larger than in production, not only with respect to the costs.

The outsourcing market is a growing market with a very high growing rate. The rapidly increasing economic importance of outsourcing will not only be reflected in a large turnover but also in the concentration of market forces on the outsourcing services suppliers because of the dependencies of the outsourcing companies from the outsourcing services suppliers. In 1992 the European outsourcing-market had a volume of 7,6 Billions ECU and will grow up to 16 Billions ECU until 1997. Table 1 shows the 9 largest outsourcing services suppliers in Europe 1992 with their annual turnover (taken from a note in *Wirtschaftsinformatik*, Nr. 1 1994, p. 91).

Supplier	1992	Supplier	1992
EDS	491 ECU	Cap Gemini Sogeti, France	201 ECU
Digital	323 ECU	Datev, Germany	177 ECU
Dehis, Germany	310 ECU	IBM	169 ECU
Finsiel, Italy	222 ECU	Sligos, France	161 ECU
		GSI, France	159 ECU

Table 1. The 9 largest outsourcing services suppliers in Europe 1992

In USA a lot of companies makes use of outsourcing to solve I&C problems and to get more efficiency in the I&C area (cp. e. g. Lacity et al. (1993, p. 13)). The new outsourcing services branch makes considerable turnovers as it is shown in table 2.

Company	Revenue	Company	Partner	Vol. (mill. \$)
EDS	5470 mill. \$	System One	EDS	2.000
IBM	3250 mill. \$	Enron	EDS	750
Anderson Consulting	1440 mill. \$	First City	EDS	600
Comp. Sciences Corp.	1440 mill. \$	Eastman Kodak	IBM	500
DEC	1000 mill. \$	National Car Rental	EDS	500
KMPG Peat Marwick	600 mill. \$	First Fidelity	EDS	450

Table 2. The 6 largest outsourcing vendors in USA 1989 and large outsourcing contracts in USA 1991 (from: Lacity et al. (1993, p. 14))

1.4 Development of outsourcing

In the seventies and eighties, the use of I&C was influenced by the development of hardware (smaller, cheaper and more efficient), software (standard software, integrated systems) and new concepts (integration, intercompany data processing). The fast I&C development and the induced changes in organization and information processing led to a lot of problems like

- short cycles of innovation and, induced by this, problems of adaption,
- insufficient qualification of employees,
- problems of security,
- high risks of failure,
- reliability problems.

To solve these problems more and more companies are going to outsource I&C tasks with the goal of optimizing benefits.

The development of I&C to outsourcing is characterized by the following phases:

- In the "classical" data processing department or computer center all I&C activities were concentrated. It was operating as a closed shop or black box and not opened for users.
- The development of hardware and software led to decentralization of hardware (PCs, work stations, networks) and to personal computing or individual data processing. This was accompanied by an increasing demand of support and service to the users of decentralized I&C.
- The high degree of decentralization and the fast development of I&C technologies in connection with increasing complexity (and sometimes decreasing reliability) and a lag in qualification of employees induces outsourcing.

2 Reasons for outsourcing

In literature we can find a wide spectrum of reasons to outsource I&C tasks. The following survey gives an overview but could not lay claim to completeness (cp. to the reasons of outsourcing e. g. Heinrich (1992), Knolmayer (1993), Lacity et al. (1993), Lang (1992), Szyperski et al. (1993)).

Internal motivation to outsourcing comes from

- strategic reasons: increasing orientation to processes and projects and turning away from orientation to functions, general trend to outsource service functions,

concentration to the core business of a company and in connection with this the delegation of secondary functions to service companies: "do what you can best - outsource the rest";

- personnel reasons: insufficient qualifications of users, low qualifications of I&C employees or for lack of I&C specialists;
- economic and organizational reasons: demand on rationalization efforts, high I&C costs, problems of authority and competence between functional departments and the I&C department;
- reasons from insufficient I&C in the past: deficient I&C in the past, increasing complexity in I&C, short cycles of innovation in hard- and software, increasing problems of hardware and network management, problems of security.

In a study of Lacity et al. (1993, pp. 198) the following six reasons were pointed out as the main motivation for outsourcing:

- Reaction to the efficiency imperative.
- The need to require resources.
- Reaction to the bandwagon.
- Reduce uncertainty.
- Eliminate a troublesome function.
- Enhance credibility.

External motivation to outsourcing comes from the market or from the services offered by the outsourcing vendors:

- optimal utilization of specialized I&C employees,
- high qualified staff,
- input of modern hard- and software,
- short cycles of innovation in hardware, software and I&C concepts,
- reserve capacity,
- optimal capacity control,
- high potential in automatization of system operating and network operating,
- short reopening time in any case of damage.

3 Object of outsourcing

3.1 Basic ideas about the I&C tasks which can be outsourced

In practice there is a wide range of different outsourcing contracts and solutions. They are reaching from temporal limited delegation of a single I&C task like data collection or scanning questionnaires and the statistical evaluation of the data gathered by the questionnaires up to a nearly complete outsourcing of the I&C department. A total outsourcing of I&C is impossible because information arising in the company as well as the results of information processing were needed in the company. At least the interfaces must be left in the company. This is a characteristic of outsourcing and implies a more or less integration of the outsourcing vendor into the I&C processes of the outsourcing company.

Figure 3 illustrates how outsourcing resp. the outsourcing vendor is integrated in the overall I&C process of the company.

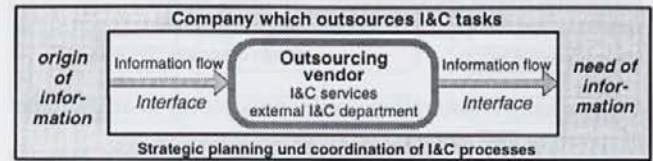


Figure 3. Integration of an outsourcing vendor into the companies information process

Thus from the companies view and the companies overall I&C process there are natural limits of outsourcing. Limits we will also find looking to the I&C tasks in the company. The development and updating of an information strategy and the design and planning of basic or strategic concepts of I&C processes should be left inside the company because of their vital importance.

3.2 Width of outsourcing

The strategic planning of outsourcing has to determine, which functions or tasks should be delegated to an outsourcing vendor.

From the viewpoint of the companies divisions or departments outsourcing domains may be e. g. from:

purchasing	selling	research & development
materials management	finance	project management
production	accounting	and others

From the viewpoint of the I&C department we can distinguish between:

system development	computer center	programming
system operating	upper support	data collection
	and service	
network management	maintenance	

Looking to the duties of an information management (cp. e. g. Schwarze (1990) and (1993)) the strategic outsourcing decisions should reflect the following:

Strategic duties are not or only partly suitable for outsourcing:

- *Planning and design of information infrastructure* has long term impacts and plays an important role in the general strategic planning. Thus outsourcing will mainly be restricted to consulting. The fundamental decisions and planning duties must be done by the (top) management.
- *Management of technological innovation* requires a high level of specialized knowledge, thus outsourcing will bring benefits.
- *Design of I&C systems and organizational concepts* touches the whole organization and so only parts of these tasks are suitable for outsourcing.
- *The development of an information strategy* is a duty of the top management and should not be delegated to an outsourcing vendor.

The tasks of *system design and realization* could be outsourced in a high degree, concerning

analysis of the present state	management of I&C projects
requirements analysis and specification	purchasing software
software development	design of data bases
hardware configuration	design of security concepts

Outsourcing is also rather easily possible for nearly all *tasks of operating I&C systems*:

service for decentralized hardware	data management
hardware maintenance	security management
network management	disaster management
computer center	I&C revision
user support	accounting

The decision about outsourcing width depends on the following criteria:

- strategic role for the company,
- security requirements,
- requirements to the level and quality of realizing I&C tasks,
- degree of automation and integration.

3.3 Depth of outsourcing

Outsourcing depth is referring to the question, if a special I&C task should be delegated to an outsourcing vendor in whole or in part. Most tasks of operating I&C systems, like transaction processing, production service and utility processing, could be undertaken by an outsourcing vendor. Conception and design of I&C systems, duties of security and controlling must be left partially inside the company. But today sometimes outsourcing concerns even the area of I&C management.

3.4 Special outsourcing domains

Outsourcing is practiced sometimes to special domains, e. g. to support individual information processing by

- provision of hard- and software,
- installation and management of networks,
- maintenance of hard- and software,
- training and support when using new software,
- development of new applications and
- user service.

A particular case is every system of intercompany I&C processing like "just-in-time" or "electronic banking". These systems inevitably lead to outsourcing.

3.5 Support systems for the outsourcing decision

Planning and preparing outsourcing of I&C tasks and I&C facilities is a very complex and partly fuzzy problem. So obviously managers are looking for decision support, for which there are different techniques and methods. Knolmayer (1993) discusses seven different decision support approaches and their application to the outsourcing problem:

portfolio analysis	benefit value analysis
check list	cluster analysis
argument balance	complete enumeration
different models of mathematical optimization	

Most of these approaches are difficult to apply because it is complicated or nearly impossible to get the information necessary for applying the models.

4 Choice of an outsourcing partner

The choice of an outsourcing partner is difficult, because the outsourcing vendor doesn't act as an usual supplier because his service is - depending on the outsourcing concept - more or less integrated in the operational procedure of the company. This is caused by the role of information and I&C systems in the internal processes and organization. So outsourcing does not lead to the usual relationship between customer and supplier. Outsourcing is more, it is a special type of partnership.

The following criteria may be helpful to support the choice of an outsourcing partner:

- level of know-how,
- experiences in the interesting I&C domains,
- neutrality with respect to hard- and software suppliers,
- service and support in the phase of conversion and operation,
- personnel and technical resources,
- mid term and long term capabilities to extend the partnership,
- strategic objects of the outsourcing partner, compatibility of his objectives and his strategy with the corporate objectives and corporate strategy,
- competitive ability, innovation capability and economic power of the outsourcing partner,
- degree and level of specialization in those fields of I&C which should be outsourced,
- service level,
- price.

The relationship between the outsourcing company and the outsourcing partner may be of different types, e. g. the outsourcing partner could be

- an affiliated company, which is (1) only active for the parent company or (2) also for other companies,
- a company, independent in law and economically.

Other solutions are

- the outsourcing partner acquires the computer center of the outsourcing company,
- the outsourcing leads to a reduction of I&C resources and I&C employees,
- outsourcing is only realized to special I&C domains,
- the outsourcing partner is a specialized I&C service company for a certain economic or business sector or branch.

Outsourcing induces long term business ties and thus a systematic action model for the choice of an outsourcing partner is necessary. Two proposals are shown in figures 4 and 5. Figure 4 shows the phases of planning and preparing an outsourcing decision.

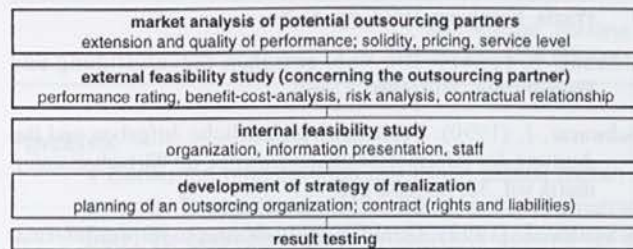


Figure 4. Action model for planning outsourcing (cp. Lang (1992, p. 74))

Figure 5 is directly oriented to the choice of an outsourcing partner. Both models shown in figure 4 and 5 may be modified with respect to the individual situation.

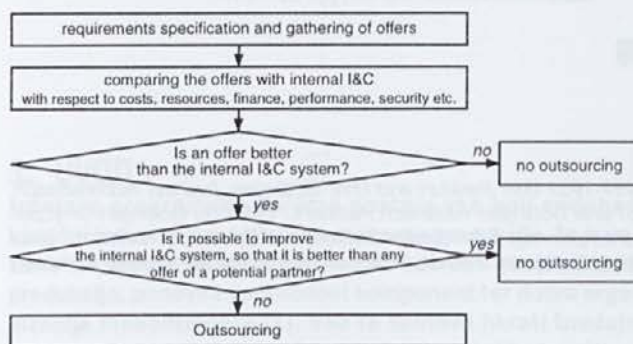


Figure 5. Action model for the choice of an outsourcing partner (cp. Lacity et al. (1993, p. 231))

5 Organization of outsourcing

The result of outsourcing is a cooperation between two partners, the outsourcing company and the outsourcing vendor. To ensure high efficiency of this cooperation, the operation of outsourcing requires an adequate organization. The management of both partners is controlling the outsourcing. This outsourcing management or parts of it may be delegated to a control and coordination committee which is responsible for the whole outsourcing cooperation. The outsourcing process itself resp. the outsourcing activities then could be regarded as something like an intersection between the two partners.

As I&C processes play an essential role in the work flow resp. business processes, it is necessary, to install a quality control to supervise the outsourcing activities.

Based on the outlined ideas Figure 6 shows how outsourcing may be organized. The arrows are illustrating flows of information, instructions and work.



Figure 6. Organization of outsourcing

6 Advantages and disadvantages of outsourcing

Outsourcing is entailed with different advantages and disadvantages. The following catalogue gives an overview (cp. e. g. Heinrich (1993), Heinrich (1993a, p. 43), Knolmayer (1994), Lang (1992, pp. 74-80), Sommerlad (1993, p. 48)):

advantages

- reduction of the complexity of I&C processes,
- access to innovations,
- access to high competence and know how,
- access to high standards in hard- and software,
- access to high processing and storage capacity,
- reduction of the danger of a bottleneck in I&C processes,
- reduction of technical and personnel risks,
- concentration to the primary functions or core business,
- flexibility,
- better service,
- risk transfer,
- cost reduction by economies of scale, less training, fewer measures in security and data protection, no capacity reserves for processing peaks;

disadvantages

- dependence from the outsourcing partner,
- problems of coordination and control,
- loss of competence and know how,
- risk of bad performance of the outsourcing partner,
- frictional loss between internal and external employees,
- problems of acceptance in the functional departments,
- costs of transaction, data transmission, reorganization, accounting, coordination and control, administration.

7 Final remarks

Outsourcing induces a lot of changes in the whole domain of information management and related areas. Thus an outsourcing strategy is needed which includes an action model for the choice of an outsourcing partner as well as criteria and concepts for outsourcing width and depth. In the process of current operations a new position or department is necessary to coordinate and control the outsourcing process. This includes all aspects of cooperation with the outsourcing partner.

Looking to the advantages and disadvantages one can suppose that in many cases it would be difficult (or nearly impossible) to decide about outsourcing by a cost-benefit-analysis. Most benefits are qualitative and could not be used for calculation of profitability. But one can assume that outsourcing gives a lot of benefits especially because of the access to competence, know how, actual and modern hard- and software and reserve capacity. Thus outsourcing would be a way to solve problems in the I&C domain of a company.

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Jochen Schwarze *Brief Curriculum Vitae*

1957 Abitur / 1957-1959 Apprenticeship Industrial Management / 1959-1963 Univ. Frankfurt and Univ. Göttingen: Business Administration, Diplom-Kaufmann / 1963-1966 Univ. Göttingen: Mathematics / 1963-1967 Univ. Göttingen: wissensch. Assistent / 1967 Univ. Göttingen: Dr.rer.pol. / 1967-1972 Univ. Münster, 1972 Habilitation / 1972-1990 Techn. Univ. Braunschweig: Full Professor Statistics and Operations Research / since 1990 Univ. Hannover: Full Professor Business Administration esp. Business Computer Science, Head of the Institute for Business Computer Science

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21 books (e. g. Netzplantechnik, 7. Ed. 1994; Mathematik für Wirtschaftswissenschaftler 4 Vol, 9. Ed. 1992; Statistik, Band I, 7. Ed., Band II, 5. Ed. 1993; Personal-Computer 1985; Einführung in die Wirtschaftsinformatik, 3. Ed. 1994); and more than 130 articles.

Pričujoči članek, ki ga objavljamo v originalu, je bil predstavljen kot referat na Četrtni mednarodni konferenci o razvoju informacijskih sistemov ISD'94 na Bledu, v septembru 1994. Objavljen je bil tudi v zborniku konference.

Uredniški odbor se je odločil za ponatis v reviji v prepričanju, da je prispevek zaradi aktualne tematike zanimiv za širši krog bralcev. Na tem mestu se zahvaljujemo organizacijskemu odboru konference in avtorju za dovoljenje za objavo.