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Cooperation Information Systems (CIS)
- Typology and Illustrative Examples -

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Abstract

Information systems (IS) enable and enhance cooperations between companies in numerous ways. IS used in cooperations are labeled Cooperation Information Systems (CIS). Along the two dimensions "functional scope" and "autonomy" of the system, a CIS typology is introduced which leads to three generic types of CIS: Cooperation Operation Systems, Cooperation Management Systems, and Cooperation Triggering Systems. This paper covers the different functions and requirements as well as practical examples for each type. It further discusses evolution patterns of CIS and implications for CIS design; one final objective of the paper is to encourage enterprises to think creatively about the leveraging role of IS for establishing and running cooperations.

1. Introduction

"The really new opportunity, it turns out, is in joining forces *without* merging."[2]

By linking procedures within and between companies and enhancing the coordination and controlling function, information systems (IS) enable and enhance cooperations between companies in numerous ways.
The term "cooperation" labels either
(1) a generic type of an interdependent strategy
(2) a set of joint activities, or

[1] Handling all correspondence.
[2] Konsynski; McFarlan (1990), p. 114.

(3) the organizational set-up between companies which
- are peers[3]
- are legally independent,
- follow a long-term perspective[4] to implement a compatible strategy.

An example for (1) from outside the IS world is the explicitly formulated strategy of two pharma-ceutical firms which are committed to swap resources in their distribution channels - in other words, to allow each other to use the partneres distribution channel for their drugs. In practical terms, the cooperation would comprise activities necessary to implement this strategy, such as adding each partneres drugs to the range of goods offered to wholesalers and pharmacies (2). As an example for (3), the two companies decide to set up an organizational unit which serves as a distribution infrastructure for both partners, such as order processing, warehousing, and delivery.
Since the organizational set-up provides the frame for (1) and (2), this paper focuses on the third of the above definitions of a cooperation, and the paper proposes a typology of IS within horizontal cooperations, in the following called Cooperation Information Systems (CIS).

2. CIS Framework

Reality shows a wide range of IS which are used jointly by companies which have joined forces. A typology is needed to differentiate the observed examples, to focus discussions, and to help firms to identify opportunities of leveraging cooperative strategies by using IS.

The variety of IS observed within cooperations is differentiated by posing the following questions:
- What is the functional scope of the system? Is it the information backbone of a whole business, or is its use limited to specific functional segments? Does it support planning and/or operational activities? Does it focus on businesses the partners are already engaged in, or does it intend to develop new business opportunities?
- What is the degree of autonomy of the CIS? IS autonomy refers to the independence of the CIS of other IS implemented by the cooperating partners. If most functions of a CIS are distributed among the operational IS of the partners, CIS autonomy is low (e.g. EDI embedded in proprietary systems of the cooperating partners), while a CIS supporting a wide range of functions within a separate system possesses a higher degree of autonomy (e.g. carrier reservation systems). Generally, a high degree of IS autonomy is observed in cooperations which are

[3] The term "peers" refers to horizontal cooperations which are characterized by an ambiguous relationship between the cooperating companies, as they are cooperating partners and potential competitors at the same time. Widely-spread vertical arrangements are not examined.

[4] Bakos; Brynjolfsson (1993) discuss extensively the necessary long-term orientation in order to justify relation-specific investments.

business-idea driven. These cooperations are created to support a diversification strategy and therefore cannot be based upon existing IS.

- What is the importance of the CIS for the cooperation? Is it crucial for the cooperation, or does it support functions which are also feasible without the system?

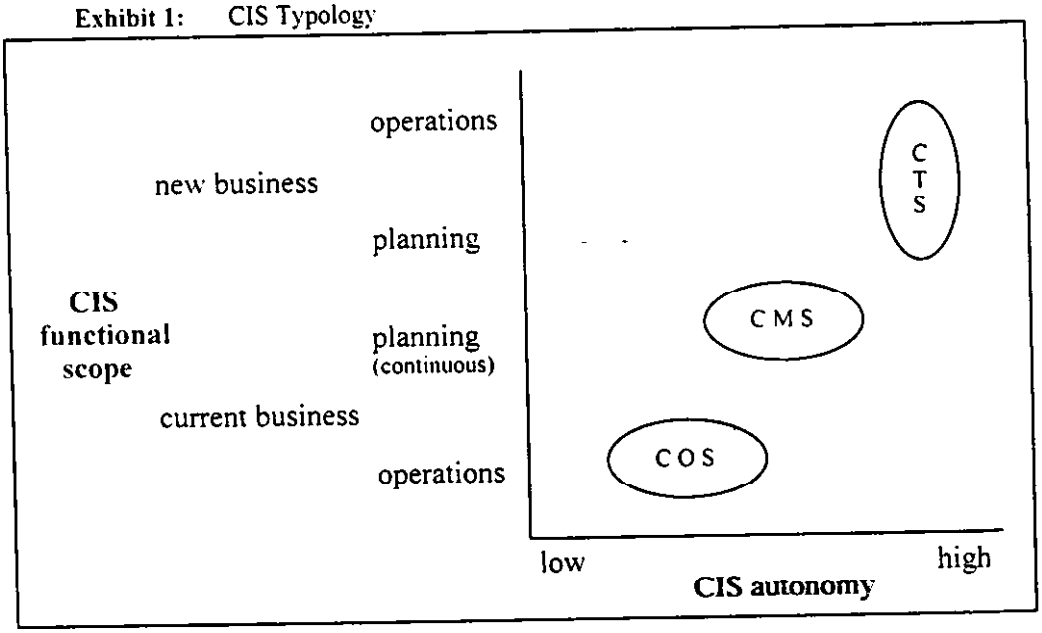
These questions lead to two main dimensions, founding a CIS typology:

- Functional Scope (planning / operations -- current / new business)
- CIS autonomy (high / low)

The following three types of CIS can be positioned in a framework built along these dimensions:

- Cooperation Operation Systems (COS)
- Cooperation Management Systems (CMS)
- Cooperation Triggering Systems (CTS)

Exhibit 1: CIS Typology



3. Cooperation Operation Systems (COS)

As Cooperation Operation Systems (COS) are usually linked to other operation systems of the partners, they are characterized by a low to medium degree of autonomy. They support the operational business processes between cooperating partners, which can be linked only if information processes are also linked in a corresponding manner.

COS occur in two different forms: A COS is either composed of several modules which belong to the proprietary operation systems of the cooperating partners, or it is a separate system which builds the integrating bridge between the partnersę operation systems.

A wide range of COS purposes can be distinguished depending on the goals of a cooperation. Examples include order and delivery systems, production planning systems, or electronic sales support systems. Table 1 gives examples of available COS, some of which are discussed below, and specifies their respective features.

In a cooperation in the area of research and development, the partnersę needs concentrate on the free flow of project-specific information. Systems which support groupwork, such as Lotus Notes, are readily available solutions to fulfill this objective. Procurement cooperations which aim at bundling buying volumes need features which support separate accounting and individual links to the partnersę inventory systems. The fashion information planning system (FIPS) of a large European department store chain is a prominent example for such an COS. Marketing cooperations, on the other hand, usually require IS for exchanging, retrieving and analyzing market information and customer data. A marketing cooperation of a gardening retailer and a book distributor is supported by IS: the gardening retailer forwards data on its customers with specific information about the products ordered to a book distributor who compiles and mails highly individualized offer lists with books of interest to the gardening retailer's clients. Management functions in cooperations, such as project management and controlling, still lack an IS support which fulfills cooperation-specific requirements.

Practically speaking, cooperations are hardly restricted to only one of the functions mentioned in the table. In many cooperations, several functions of the value chain or separate systems are linked. For example, companies making joint bids or developing an interdependent range of products cooperate simultaneously in the areas of research, production and sales. The corresponding multiplication of interfaces between the partnersę systems and the bi-directional, multiple data flow leads to sophisticated COS requirements.

Further COS requirements result from the structure of business processes: activities in a cooperation are often executed simultaneously in a decentralized manner. COS therefore have to trigger and coordinate the sub-processes carried out by the partners as well as to monitor the completeness of all activities.

Table 1: Cooperation Operation System

Area of Cooperation: Operative Function...	Available Applications	Cooperation-specific Requirements	Examples
research and development	• e-mail • data bases • CAD	• unlimited access to project-specific information	• Lotus Notes
procurement	• procurement systems • order entry system	• joint procurement • separate accounting • link to each partner's inventory control	• FIPS[5]
production	• production planning systems (PPS)	• locally distributed, timely linked production • joint venture production	• just-in-time system among suppliers of a dashboard system
sales and distribution (pooling / swapping sales forces, products, distribution channels)	• joint customer data base • joint management of sales force	• customer data pools, differentiated along regions and other criteria • linked route planning	• code sharing among airlines (e.g. Lufthansa / United Airlines cooperation, using Galileo
marketing	• market analysis tools • communication tools	• exchange of socio-demographic data • joint compilation of market data	• exchange of buyerse data between gardening retailer and book distributor[6]
service	• joint data base • dispatching of service personnel	• single data base with decentralized input and feedback of availability and errors to partners • coordination of joint service force	• PICA[7]
project management	• project planning software	• link to each partner's time / resource planning	NOT DOCUMENTED
controlling	• MIS • EIS • reporting systems	• multi-client capability	

[5] FIPS, the fashion purchase planning and monitoring system of a European department store chain, is designed to support common fasion purchasing activites of several European fashion retailers in order to bundle their procurement volume. Cf. Loebbecke; Kronen (1994).

[6] Cf. Cash; McFarlan; McKenney (1992), p. 105.

[7] PICA (Project for Integrated Catalogue Automation) is a COS of the Dutch public libraries to support the joint cataloguing and archiving activities. Cf. Wierda (1991), p. 49-56.

A well-known COS example are just-in-time systems among suppliers in the automotive industry.[8] Due to the pyramidal structure of the supplier industry, the main contractor uses just-in-time systems to coordinate the delivery and assembly of modules (dashboards, doors etc.). In such a context, competitive COS constitute a valuable asset for the partners and contribute to survive the supplier shake-out.[9]

A cooperation aiming at bundling functions or products from a customer's point of view is characterized by the interdependence of multiple functions. For instance, outsourcing, an increasingly used option to manage a companyęs IT function, consists of bundling functions specific to a companyęs needs. The outsourcer acts as an integrator and combines several services and products (hardware, system and application software, service, training), and thus reduces the companyęs transaction costs. Not only companies, but also consumers are developing a preference for "one-stop shopping" instead of dealing with numerous providers (e.g. reservation systems for airline, hotel, and rental car; package tour; insurance broker).

4. Cooperation Management Systems (CMS)

Due to the low degree of integration with other applications, Cooperation Management Systems (CMS) posses a high degree of autonomy. CMS support mainly planning activities during the start-up phase as well as along the entire life-cycle of a cooperation.

The focus of activities in the phase of acquiring a cooperating partner and setting up the cooperation rests on strategic planning functions. IT provides numerous tools to support these tasks within a single enterprise.[10] To manage a cooperation, already existing systems for internal strategic planning can be used. Examples include IS-based strength-weakness analyses, applications to segment strategic business units, and tools for project management or budget planning or control.

In order to be used in cooperations, these applications must fulfill cooperation-specific requirements. Therefore, their features have to be enlarged along three dimensions:

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8 Those systems are also used in vertical relationships between the automobile manufacturer and its suppliers.

9 The number of suppliers in the automotive industry generally decreases as the necessary relation-specific investments are increasing (for CAD/CAM systems, JIT systems). This is one implication of the "move-to-the-middle hypothesis", cf. Clemons; Reddi (1993), p. 809. Bakos; Brynjolfsson (1993) emphasize the decreasing number of suppliers especially in a quality-oriented competition. Empirical studies confirm the reduction of suppliers in the European automotive industry to 20% of the original number within the last 15 years, cf. Bertodo (1991), p. 46.

10 Supporting management functions has always been on the agenda of the DSS field. A critical overview how IS could support management can be found in Keen (1987). Mockler; Dologite (1991) give an overview over available systems.

(1) Contents

Applications have to cover contents and details relevant to the cooperation. Models embedded in an application must allow for cooperative activities instead of only permitting competitive relations with other enterprises. An example is using an IT-supported competitor analysis for profiling and identifying potential cooperating partners. Electronic checklists, a convenient tool for strategic planning, must be enriched to contain cooperation-specific items for analyzing the companyęs needs for a cooperation or for selecting a cooperating partner.

(2) Multi-Client Capability

All applications in a cooperation must be able to treat the cooperative structure as a separate unit of analysis. The system has to be capable to recognize the cooperation as a separate structure and the partnering companies as the cooperationęs "clients", it must allow for several "views" on the cooperation. In this context, data specific to the cooperation must be identified, manipulated and stored without being mingled with the partnersę own business data. Another CMS requirement is to verify the compatibility between the cooperationęs planning and project management data with each partneręs figures and capacity restrictions. Shifting resources between partners gives each cooperation additional flexibility which should be fully exploited by a high-performing CMS.

Table 2: Cooperation Management Systems

Management Function	Available Applications	Cooperation-specific Requirements	Examples
strategic analysis	• portfolio systems • value chain simulation • other simulation	• competitor analysis • profiling potential cooperating partners	NOT DOCUMENTED
planning and project management	• project mana-gement software • planning systems for certain functions (e.g. sales, budgeting, procurement) • electronic checklists	• link with time resource management of partners • cooperation-specific items	
communication	• groupware • e-mail	• inter-organizational	
controlling	• MIS • EIS • reporting systems	• multi-client capability • joint control of cooperation, including feedback to partners	

(3) Communication

A final CMS requirement is to permit links between the CMS of all cooperating partners. In the case of informal communication, electronic mail provides a relatively stable and convenient tool based on widely-spread standards on the transportation layer of the OSI 7-layer model. A communication link on the application layer, however, is more difficult to implement, especially when striving for distributed applications, which require open system architectures.

Most applications for strategic planning provided on the market lack any form of integration. They are difficult to link with other applications, data cannot be imported from operations, etc. Cooperating partners, who want to use IS to support their cooperation management, have to make strong efforts to develop necessary CMS features. Unfortunately, the CMS features discussed above are neither widely spread nor available on the market. Table 2 summarizes cooperation-specific requirements for CMS.

5. Cooperation Triggering Systems (CTS)

Cooperation Triggering Systems (CTS) drive cooperations and are therefore their purpose and focus; they regularly show a high degree of IS autonomy and usually cover a wide range of planning and operational functions. CTS are often the result of innovative business ideas and lay the ground for an IS-based diversification providing a new business opportunity unrelated to the sponsoręs / participantsę field of business.

An example is EUROSELECT[11], a cooperation in the European grocery wholesale industry. The cooperationęs sponsor, a medium-sized Dutch wholesaler named Van Eerd, had the vision of building a CIS for Europe-wide market intelligence, thus daily locating the best buys all over Europe. Van Eerd was determined not to leave the market to large players just because they are better informed, but to close this information gap by making technology work for him. Therefore, Van Eerd set out to develop an appropriate CIS and sponsored its development. After the system was available, the sponsor invited other medium-sized wholesalers in various European countries to join in a cooperation which allows each of them to provide and use price information from all over Europe - a former privilege of large wholesalers. PRODEC, EUROSELECTęs CTS, contains an electronic product catalogue and price-quality comparison features, and thus was the prerequisite for founding a new competitive organizational set-up. It supports all transactions from gathering information to placing bulk orders for EUROSELECT partners. For the sponsor, EUROSELECT has turned into a successful new business unit.

Cooperations which aim at bundling functions, products or services are especially prone to use CTS. CTS facilitate to jointly offer the products of several suppliers and thus to offer convenience from a customeręs point of view. American Airlines, Hilton hotels and Budget Rent-A-Car have joined forces and IS resources in order to offer a full range of travel services to customers. The customer enjoys one-stop-shopping for all needs in air travel, accommodation and transportation. The reservation systems of all three partners have to be able to access a joint customer data base.

11 For a detailed discussion of EUROSELECT, cf. Klein; Kronen (1993).

Table 3: Cooperation Triggering Systems

Strategic Intent	Available Applications	Cooperation-specific Requirements	Examples
Procurement Pooling	• order collection system (with invoicing component)	• provider of information (price; freight space) identifiable • commission accounting • bulk orders • joint analysis of supplierse behavior • joint quality control	• various electronic market systems, e.g. TRANSPOTEL[12], IKARUS[13] • PRODEC
Bundling (Sales / Distribution Alliance)	• carrier reservation systems (CRS, e.g. SABRE)[14] • information partner-ships	• joint customer data base with separate access	• SABRE • American Airlines / Hilton and Marriott Hotels / Budget Rent-A-Car[15] • MAC (ATM Network of Philadelphia National Bank)[16]
Market Research	• product data base (cf. PRODEC)	• decentralized input; central market research channeling results to partners	• AA / Citibank / MCI • Insurance[17]
Marketing Alliance	• CRS	• separate accounting • routing of bonuses, conditions, discounts (frequent flyer miles)	• AA / Citibank / MCI • SWISSLINE[18]
Service Alliance	• software for dispatching service personnel	• mutual access to service personnel • joint customer data base	• RIA[19] (linking customer files) • Cash management Alliance[20]

12 TRANSPOTEL is a Swiss electronic market for available freight space.

13 IKARUS is an EDI-based network for the allocation of freight space, sponsored by a consortium of the Irish air freight industry, cf. Commission of the European Communities (1992), p. 60f.

14 For the historical development of SABRE cf. Hopper (1990).

15 Those companies have entered a cooperation to build a joint travel service, cf. Cash; McFarlan; McKenney (1992), p. 96.

16 Cf. Clemons (1990).

17 Porter; Millar (1985) discuss the example of an insurance company which extracts market research data from its contract data base to sell them as a separate product.

18 SWISSLINE is an accomodation reservation system, in which the Swiss Tourist Board, several regional Swiss tourist associations, and the Swiss Railroad cooperate. Cf. Ritz (1991), p. 7.

19 RIAés initiator Rosenbluth is an American travel service corporation for corporate travelling. All members of Rosenbluth International Alliance (RIA) have access to the sponsorés specific IS in order to provide world-wide customer service. RIA uses a widely-spread CRS as the carrier system for its proprietary system and thus utilizes the CRS geographic presence. cf. Clemons; Row; Miller (1992).

20 A consortium of small investment companies cooperates with a bank on the West Coast. The consortium has developed an application which allows customers with small portfolios to access their cash management accounts anytime. As the consortium did not own the infrastructure, it cooperates with a bank which allows the consortiumés customers to use the bankés Home Banking Network as a medium. Cf. Cash; McFarlan; McKenney (1992), p. 77

Cooperating partners in an information partnership draw conclusions from their joint data base which might lead to offering new products and services: thus a CTS can be the starting point for highly differentiated services. For example, a carrier reservation system may be extended into specialized travel services for corporate clients. To fully exploit the strategic potentials of such a CTS, the continuos development and maintenance of information has to be a priority from the very beginning. At the same time, the cooperationęs compatibility with the corporate strategy of each partner is crucial. Most CTS are separate systems with clearly defined interfaces to the other IS of the cooperating partners. In many cases[21], the operation of the CTS has been outsourced to the IS specialists of the systemęs sponsor, to a jointly funded company, or to an external service provider. Solving security problems in an adequate manner is a mandatory prerequisite for all of these arrangements.

Crucial for the success of a CTS is the fast implementation of a new business idea while, due to the high degree of CTS autonomy, technical integration with the partnersę operation systems is not a top priority. Common procedures and standards are defined during the development phase of a CTS, common codes for product and customer data have to be agreed upon. While an external service provider can make valuable contribution in this phase, the definition of functional requirements remains with the partners. Furthermore, the task to monitor and trigger the necessary adaptation of the CTS to the changing content of the cooperation must be fulfilled by the partners themselves.

Companies may join cooperations for a number of reasons. In a cooperative arrangement, the balance between competitive and cooperative behavior is crucial for the stability. The advantages of cooperating motivate the partners not to endanger the existence of the cooperation or its functionality by opportunistic behavior. Two main desired effects, which are discussed below, provide a strong incentive to join a cooperation and obey its rules. These desired effects also explain why cooperations built around a CTS regularly involve more than two cooperating partners:

(1) Virtual size[22] and virtual diversity

CTS-based cooperations try to lever the bargaining power of the cooperating partners. A procurement cooperation can expect better conditions than a single member if the cooperation results in a higher procurement volume. A sales cooperation, e.g. Ocean Spray Cranberries[23], offering a high volume or a wide range of products can lever its power over customers.

MUSIK[24] is an example of a sales cooperation of small suppliers in Europe, in which a new distribution channel is opened by cooperation. In MUSIK, small independent

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21 For example, SWISSLINE or PRODEC, as discussed in this paper.

22 For the effect of an IS for creating virtual size effects, see Gurbaxani; Whang (1991), and Johnston; Lawrence (1988).

23 As discussed in Nielsen (1988), p. 475.

24 Cf. Commission of the European Communities (1992), p. 89f.

producers of classical music labels cooperate to produce and maintain an electronic catalogue which contains the products of all partners and is updated directly. Orders and invoices are exchanged with wholesalers and retailers using the EDIFACT standard. The virtual range of products and the use of EDI reduce the transaction costs for music wholesalers and retailers to carry MUSIK products in their line. MUSIK increases the chance to be carried in stock, even if none of its single members could succeed. At the same time, MUSIK acquires new customers which would not have dealt with each single member.

To jointly overcome market barriers to entry, CTS in service cooperations bundle the partnersę service personnel to virtual service networks, guaranteeing geographical presence from a customereęs point of view.

Furthermore, CTS are often the "backbone" in marketing cooperations. These cooperations bundle complementary products and services to a functional unit from a customereęs point of view. The customer can book a flight, reserve a hotel room and order a rental car by "one-stop shopping". In addition, marketing cooperations can increase the customereęs loyalty for all partners by awarding the purchase of their products with low transaction costs or special discounts. From the supplierseę point of view (airline, hotel chain, car rental company), the CTS is a separate distribution channel.

> "In the [American Airlines and Citibank] arrangement, air mileage credit in the airlineęs frequent flyer program is awarded to credit card users - one mile for every dollar spent on the card. American has thus increased the loyalty of its customers, and the credit card company has gained access to a new and highly credit-worthy customer base for cross-marketing. This partnership has been expanded to include MCI, a major long-distance phone company."[25]

The potential of marketing cooperations can be fully exploited only by building and using joint customer data bases. The joint data base cumulates in the life cycle of a cooperation and supplies valuable marketing data which could not be provided by external market researchers. Thus, the advantages of the cooperation reach far beyond increased customer loyalty and increased sales.

(2) Scale effects of CTS

Developing and operating a CTS usually causes high fixed cost, whereas the number of users only marginally affects the operating cost. Therefore, the more partners use the system, the lower will be the cost for each partner, and the higher the spreading of the financial risks involved. The amortization of the CTS development cost - which is sunk cost - is easier for a consortium, since the total amount is divided by all partners. However, the choice between founding a consortium and single sponsoring the CTS

[25] Konsynski; McFarlan (1990), p. 114-115.

constitutes an entrepreneurial decision because the cost as well as the CTS-generated income have to be shared.

The downside of such a decision is illustrated by Allegis, a subsidiary of United Airlines founded to provide a range of services in accommodation and transportation (airline, rental car). Instead of forming a marketing cooperation, United acquired Hertz Corporation and Westin Hotels, but failed to integrate the new acquisitions.

> "Allegisęs hard lesson [...] was that the partnerships engendered by information systems *need not be based on ownership*."[26]

6. Evolution of CIS

CIS roles are not static in the life-cycle of cooperations, but vary according to their scope[27] and scale[28]. The transformations result from deliberate decisions of the cooperating partners, or occur unintentionally. Four typical patterns of CIS transformation are discussed in the following:

(1) From COS to CMS
Functions related to the partnersę COS may become relevant for managing the cooperation. An example is adding a component to the COS which deducts controlling-oriented information from operative processes. Or a system like SAP is used for joint order placement; when adding a report module, the role of the previous COS is extended towards a CMS.

(2) From CMS to COS
Functions originally supporting the cooperation management are extended into the operation business of the cooperation. An example is the opening of a project management application, originally used by only one partner to plan the cooperation, to a planning tool for operative activities (e.g. production scheduling) in the cooperation, available to all partners.

(3) From CTS to COS
Cooperations often show self-enforcing mechanisms. A change of the cooperationęs content implies a shift of the CIS underlying the cooperation. On the other hand, redefining the CISęs scale and scope offers new potentials for the cooperation.
CTS trigger a change of the business processes of the cooperating partners, and thus lead to adapted operation systems. This transformation pattern can be observed when

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26 Cash; McFarlan; McKenney (1992), p. 96.

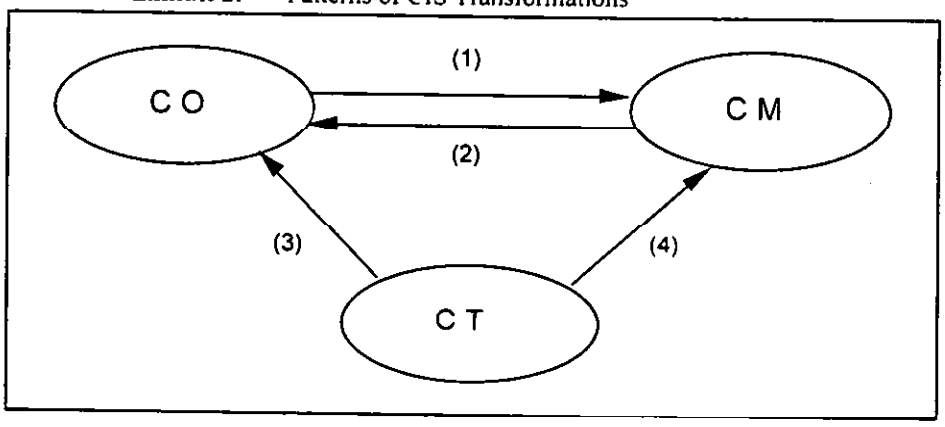
27 "The concept of [...] scope refers to the diversity of the transactions conducted", Ebers (1992), p.10.

28 "The concept of transaction scale encompasses two dimensions: (a) the frequency of identical transactions between a given set of transaction partners, and (b) the number of transaction partners involved.", Ebers (1992), p. 9.

positive experiences with using a CTS provide an impetus to increase the IS employment for other functions in the corporation.

For example, SWISSLINE[29] started out as an accommodation reservation system. In the near future, it will be linked to several carrier reservation systems (Amadeus, Apollo, Galileo, Start, Sabre etc.). The functionality of SWISSLINE will thus shift from a peer marketing cooperation within a single industry to a cooperation bundling partners from several industries.

Exhibit 2: Patterns of CIS Transformations



(4) From CTS to CMS

A CTS that originally triggered the cooperation is enlarged to contain more sophisticated planning functions: thus, it provides assistance to manage the organizational set-up. The system derives information relevant for the strategic planning of the newly-evolved structure and for plotting a common strategy. A typical evolution is that the CTS accumulates information which allows for the extension of the functional scope and lays the ground for further business opportunities.

Being the prerequisite for a procurement cooperation, PRODEC, EUROSELECTęs CTS, started out with a core application of gathering and comparing price information all over Europe. During EUROSELECTęs life-cycle, PRODEC evolved into a CMS with an extended functional scope in order to plan management processes for the cooperating partners.

[29] Cf. Ritz (1991), p. 11.

7. Some Implications for CIS Design

Existing IS reflect organizational structures which are often outdated. In order to support cooperations, the functional scope of existing IS has to be extended. Especially flexible and project-oriented forms of the division of labor between companies were not taken into account when the present IS generation was designed. Communication audits, often the empirical base for IS design, do not routinely examine communication flows across the border of the organization.[30] While numerous developments on the technical level support working in distributed architectures[31], current enterprise models do not emphasize these recent developments and therefore show deficits in designing flexible boundaries of the firm.

In the future, IS design has to take into account new models of intercorporate links in order to support the emerging number and variety of cooperations. Corporations cannot afford to let the opportunities pass which can be exploited by joining forces, just because their information systems lack capabilities of CIS or even do not allow links to any form of CIS.

The value of IS-based cooperations stems partially from their potential for restructuring and rationalizing internal structures and processes, known as "Business Process Redesign" (BPR).[32] Designing IS and organizational structures is a highly mutual adaptation process. On the one hand, IS should be customized to specific needs of an organization, on the other hand, they should not be adapted to existing structures without questioning them thoroughly.

This paper introduces the concept of Cooperation Information Systems (CIS) and develops a typology along the dimensions of the functional scope and autonomy of CIS. Depending on the various position in a resulting matrix, three types of CIS are differentiated: (1) Cooperation Operation Systems (COS), which are characterized by a limited functional scope as well as a low degree of CIS autonomy, (2) Cooperation Management Systems (CMS), which support management functions associated with steering a cooperation in an existing business, and possess a medium degree of autonomy, and (3) Cooperation Triggering Systems (CTS), which are levers to develop new joint businesses which very strongly rely on an innovative IS. CTS typically cover a wide range of functions and, being usually engineered for the specific purpose of supporting the cooperation, are highly autonomous. Further research is needed to fully explain transformation patterns between CIS, and to advise companies how they can deliberately control the transformation process.

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30 Cf. Frank; Kronen (1991), p. 83f.

31 E.g. Open Distributed Processing: Distributed Computing Environment. The implementation of these technologies focusses on systems for Collaborative Computing and Computer Supported Cooperative Work (CSCW).

32 Among others, cf. Venkatraman (1991).

Furthermore, this paper provides a conceptual framework to exploit new business opportunities by combining the mutually interdependent strategy of cooperation and IS which span corporate boundaries. It therefore intends to encourage practitioners to identify the chances provided by the cautious development of CIS which can be transformed in the course of time, and by conceptualizing new businesses which are fully leveraged by the creative use of CIS.

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